Swallowing disorders: from compensation to recovery

Precongress course: New approaches to neurogenic dysphagia

HANDS ON COURSE ON OROPHARYNGEAL DYSPHAGIA

BARCELONA
28 SEPT-03 OCT, 2015
www.myessd.org
World Swallowing Day Survey

7 – 11 December, 2015

Do you screen for dysphagia?
Please join us in collecting and sharing data from around the world on screening procedures and practices.
First results will be given on World Swallowing Day, 12 Dec

Register with executiveofficer@myessd.org
information: www.myessd.org
Dear colleagues and friends,

On behalf of the Local Organizing committee it gives us great pleasure to welcome you to the 5th ESSD Congress “Swallowing Disorders: From Compensation to Recovery” and the Precongress course “New approaches to neurogenic dysphagia” in Barcelona. This year we have expanded the congress into a Dysphagia Week, with a three-day Hands-on course on OD: “Screening, assessment and new neurorehabilitation treatments” held at Mataró Hospital, so we have a full week dedicated to promote the best clinical practice and the best science for our patients with OD.

Thank you for supporting the congress and for sending your best studies to be presented and debated here. This year we have 200 abstracts presented from all around the world and most of them of the highest quality, it has been a very strict and difficult task to review and rate all this excellent work.

It is encouraging to see the ESSD congress grow into a truly international event, with delegates from all corners of the world. We try to match this international character by inviting experts, leaders in their field, from near and far. This is the 5th meeting of the ESSD and I’m proud to say you that our meeting is consolidated as one of the most relevant events in the world of dysphagia.

Finally, let us welcome you to Barcelona, a city long accustomed to welcoming people from all quarters, a port through which people have come and gone and shared knowledge and customs for hundreds of years. It is also exciting you are visiting Catalonia a nation that will have decided this month if they want a state, a country to face its future.

I sincerely wish that you enjoy your stay and find the congress a fruitful and interesting experience.

Pere Clavé, MD, PhD, ESSD president

Renée Speyer, PhD, ESSD secretary Co-chair of the Congress
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Committees

Local Organizing Committee

Pere CLAVÉ, Chairman, Surgeon
Renée SPEYER, Co-Chairman, SLP
Laia ROFES, Research fellow
Viridiana ARREOLA, SLP
Rosa TERRÉ, Rehabilitation
Ernest PALOMERAS, Neurologist

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<th>Time</th>
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<tr>
<td>08:00</td>
<td>Precongress Course on Neurogenics</td>
<td>Palau de Congresos, THURSDAY 1 OCT</td>
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<tr>
<td>08:30</td>
<td>P01 Diagnosis and Assessment, High speed CT scan, EMG, US, rTMS, EEG, Magnetocephalography, fMRI</td>
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<td>09:00</td>
<td>P02 Research into new treatments, transcutaneous &amp; intrapharyngeal elec stim, DTCS, rTMS, paired associative, mech/physical stim.</td>
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<td>10:00</td>
<td>Coffee break</td>
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<td>11:00</td>
<td>P03 Integration pharm stim and biomechanical effects, noninvasive brain stim, brain plasticity, evidence</td>
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<td>12:00</td>
<td>LUNCH</td>
<td>S1 Industry symposium</td>
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<td>12:30</td>
<td>Open ceremony</td>
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<td>13:00</td>
<td>P04 Round table discussion: Translation to clinical practice</td>
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<td>13:30</td>
<td>S2 Industry symposium (45m)</td>
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<td>14:00</td>
<td>LUNCH</td>
<td>S5 FEES symposium</td>
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<td>S4 Industry symposium</td>
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<td>Welcome reception</td>
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<td>S1 Industry symposium</td>
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<td>5th ESSD Congress, Swallowing Disorders: From Compensation to Recovery</td>
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<td>Palau de Congresos, FRIDAY 2 OCT</td>
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<td>08:00</td>
<td>01 Fluid adaptation, Mats Stading</td>
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<td>08:30</td>
<td>02 Free papers on Screening and Clinical Assessment</td>
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<td>09:00</td>
<td>03 Solid and food adaptation, Jun Kayashita</td>
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<td>04 Free papers on Instrumental Assessment, QoL and Professional Roles</td>
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<td>10:00</td>
<td>S2 Industry symposium</td>
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<td>11:00</td>
<td>05 Rheology, white paper, Roger Newman</td>
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<td>06 Mastication, Koichiro Matsuo</td>
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<td>12:00</td>
<td>07 Parallel poster groups A-H</td>
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<td>12:30</td>
<td>Coffee break</td>
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<td>13:00</td>
<td>08A Free papers on HNC &amp; physical rehab</td>
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<td>08B Free papers on Paediatric Dysphagia</td>
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<td>09 Postures &amp; manoeuvres, R. Gonçalves</td>
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<td>15:00</td>
<td>S2 Industry symposium</td>
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<td>18:00</td>
<td>S6 Industry symposium</td>
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<td>18:30</td>
<td>10 Free papers on Physiology, Neurophysiology and Neurorehabilitation</td>
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<td>19:00</td>
<td>11 Neurorehab in post stroke, Philip Bath</td>
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<td>20:00</td>
<td>12 Free papers Dysphagia in Old Age, Stroke, &amp; Neurodegenerative diseases</td>
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<td>Closing ceremony/Awards</td>
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08:30-10:30  Precongress session 01. New diagnostic/assessment tools
Chairs: A. Schindler, M. Walshe

- HIGH SPEED CT SCAN, Yoko Inamoto, Japan; 15min + 5
- ELECTROMYOGRAPHY, Domenico Restivo, Italy; 15min + 5
- ULTRASOUND, Maggie-Lee Huckabee, New Zealand; 15min + 5
- rTMS, Emilia Michou, UK; EEG, Laia Rofes, Spain; 15min + 5
- MAGNETOCEPHALOGRAPHY, Rainer Dziewas, Germany; 15min + 5
- FUNCTIONAL MAGNETIC RESONANCE IMAGING, Georgia Malandraki, USA; 15min + 5

10:30 - 11:00  Coffee break

11:00 - 13:00  Precongress session 02. Research into new treatments
Chairs: S. Hamdy, V. Woisard

- TRANSCUTANEOUS ELECTRICAL STIMULATION, João Batista, Portugal; 15min + 5
- INTRAPHARYNGEAL ELECTRICAL STIMULATION, Satish Mistry, UK; 15min + 5
- TRANSCRANIAL DIRECT CURRENT STIMULATION, Ichiro Fujishima, Japan; 15min + 5
- rTMS, Jin Woo Park, Korea; 15min + 5
- PAIRED ASSOCIATIVE STIMULATION, Emilia Michou, UK; 15min + 5
- MECHANICAL/PHYSICAL OROPHARYNGEAL STIMULATION, Ruth Martin, Canada; 15min + 5

13:00 - 14:00  Lunch

13:30 - 14:00  Industry symposium 1
14:00 - 15:30  Precongress session 03. Integration
Chairs: G. Ickenstein, E. Verin

Auditorium-Room J

PHARMACOLOGICAL STIMULATION AND BIOMECHANICAL EFFECTS ON SWALLOW PHYSIOLOGY, Pere Clavé, Spain; 15 min + 5
NON-INVASIVE STIMULATION IN POST-STROKE OD, Sandeep Kumar, UK; 15 min + 5
BRAIN PLASTICITY, Ianessa Humbert, USA; 15 min + 5
EVIDENCE AND REGULATORY ISSUES, tbd, Spain; 15 min + 5

15:30 - 16:00  Coffee break
Exhibition Hall

16:00 - 17:30  Precongress session 04. Round table discussion
Moderators: Pere Clavé, Spain; Maggie-Lee Huckabee, New Zealand

Auditorium - Room J

Round table members: Rainer Dziewas, Germany; Ichiro Fujishima, Japan; Shaheen Hamdy, UK; Ianessa Humbert, USA

17:30 - 18:15  Industry symposium 2
Symposium room - Room A

18:15-19:00  Welcome Reception
Exhibition Hall
FRIDAY, OCTOBER 02

08:00 - 08:30  Session 01. Adaptation of Fluids  
Auditorium - Room J  
Chairs: O. Ekberg; J. Kayashita  
Invited speaker: Mats Stading, Sweden

08:30 - 10:00  Session 02. Free papers, Screening and Clinical Assessment  
Auditorium - Room J  
Chairs: M. Huckabee; I. Humbert

OP2.1 MEASUREMENT OF OXYGEN DESATURATION IS NOT USEFUL FOR THE DETECTION OF ASPIRATION IN DYSPHAGIC STROKE PATIENTS  
T. Marian; J. Schröder; P. Muhle; I. Suttrup; S. Oelenberg; C. Hamacher; T. Warnecke; S. Suntrup; R. Dziewas (Germany)

OP2.2 THE DIAGNOSTIC ACCURACY OF THE MODIFIED EVAN’S BLUE DYE TEST IN DETECTING ASPIRATION IN PATIENTS WITH TRACHEOSTOMY: A SYSTEMATIC REVIEW  
Sibylle Béchet; F. Hill; M. Walshe (Ireland)

OP2.3 COMPARISON OF COUGH REFLEX TESTING WITH VIDEOENDOSCOPY IN EXTUBATED ICU PATIENTS  
M.M. Kallesen; A. Psirides; M.L. Huckabee (New Zealand)

OP2.4 THE DIAGNOSTIC ACCURACY OF THE MANN ASSESSMENT OF SWALLOWING ABILITY FOR DETECTING DYSPHAGIA AND ASPIRATION IN A COHORT OF PEOPLE WITH MULTIPLE SCLEROSIS  
B.W. Woods; A.C. Constantinou; M.W. Walshe (Ireland)

OP2.5 WIDE RANGE OF PRACTICE IN IDENTIFYING DYSPHAGIA AFTER ACUTE CERVICAL SPINAL CORD INJURY IN MULTI-DISCIPLINARY TEAMS  
Jackie McRae (United Kingdom)

OP2.6 THE DIAGNOSTIC ACCURACY OF CERVICAL AUSCULTATION IN THE IDENTIFICATION OF OROPHARYNGEAL ASPIRATION: A SYSTEMATIC REVIEW  
S. Furey; M. Walshe; F. La Morgia (Ireland)
Scientific Programme

FRIDAY, OCTOBER 02

OP2.7  EAT-10: RELIABILITY AND VALIDITY USING RASCH ANALYSIS
R. Speyer (Australia) ; R. Cordier (Australia) ; A. Schindler (Italy); A. Karaduman (Turkey); M. Bulow (Sweden) ; P. Clave (Spain)

10:00-10:30  Opening Ceremony

10:30 – 11:00  Coffee break  
Exhibition Hall

11:00 - 11:30  Session 03  Adaptation of solid food  
Auditorium - Room J
Chairs: P. Clavé; M. Stading
Invited speaker: Jun Kayashita, Japan

11:30 - 13:00  Session 04. Free papers, Instrumental Assessment; Quality of Life and Professional Roles  
Auditorium - Room J
Chairs: P. Pokieser; A. Schindler

OP4.1  INSIGHT INTO DYSPHAGIA ASSESSMENT BY NOVICE AND EXPERT SPEECH AND LANGUAGE THERAPISTS USING EYE-TRACKER TECHNOLOGY
C.M. Steele; V. Chak; A. Dhindsa; R.D. Draimin; A. Nagy; M. Peladeau-Pigeon; M. Tapson; S. Torreiter; T. Wolkin; A. Waito (Canada)

OP4.2  TIMING PLAYS A MAJOR ROLE IN THE PATHOPHYSIOLOGY OF ASPIRATION
A. Barrett; H. Kelly (Ireland)

OP4.3  USE OF TRAINING TO IMPROVE THE RELIABILITY IN RATING VIDEOFLUOROSCOPIC SWALLOWING STUDIES (VFSS) USING TWO ANALYSIS PROTOCOLS
M.K.K. Chan; P.P.J. Cheng (Hong Kong)
OP4.4  COMPARING PATIENT AND PROXY AGREEMENT CONCERNING IMPACT OF DYSPHAGIA ON PATIENTS’ QUALITY OF LIFE (QOL) AS MEASURED BY THE DUTCH VERSION OF THE SWALLOWING QUALITY-OF-LIFE (DSWAL-QOL) QUESTIONNAIRE
I.S. Simpelaere; J. Vanderwegen; G. Van Nuffelen; M. De Bodt (Belgium)

OP4.5  HOW MUCH RESIDUE IS TOO MUCH RESIDUE?
C.M. Steele; V. Chak; A. Dhindsa; R. Draimin; A. Nagy; M. Peladeau-Pigeon; M. Tapson; S. Torreiter; T. Wolkin; A. Waito (Canada)

OP4.6  IMPACT OF SWALLOWING DIFFICULTIES ON QUALITY OF LIFE OF PATIENTS WITH MYOPATHY
W.V. Nascimento; D.R. Domenis; C.F. Sobreira; R.O. Dantas (Brazil)

OP4.7  EVALUATING THE EFFECTIVENESS OF A DYSPHAGIA TRAINING PROGRAMME IN A RESIDENTIAL CARE SETTING: APPLICABILITY OF KIRKPATRICK MODEL.
A. McEntee; M. Walshe; F. LaMorgia (Ireland)

13:00 - 14:30           Lunch
Exhibition Hall

13:30 – 14:30           Industry symposium 3
Symposium room-Room A

14:30 - 15:00       Session 05. White paper on rheology and bolus modification
Auditorium - Room J
Chairs: M. Walshe; O. Ekberg
Invited speaker: Renée Speyer, Australia; Natàlia Vilardell, Spain

15:00 - 15:30       Session 06. Mastication
Auditorium - Room J
Chairs: E. Verin; R. Martin
Invited speaker: Koichiro Matsuo, Japan
15:30 - 16:00  Parallel session 07. Poster viewing

PPA  SCREENING AND ASSESSMENT 1
Chairs: R. Speyer; M. Bülow

PPB  INSTRUMENTAL ASSESSMENT 1
Chairs: D. Farneti, P. Clavé

PPC  PROFESSIONAL ROLES IN DYSPHAGIA MANAGEMENT
Chairs: V. Woisard; H. Kalf

PPD  DYSPHAGIA IN STROKE AND BRAIN DAMAGE 1
Chairs: E. Verin; R. Dziewas

PPE  DYSPHAGIA IN NEURODEGENERATIVE AND GERIATRIC PATIENTS.
Chairs: G. Ickenstein; G. Malandraki

PPF  DYSPHAGIA IN CHILDREN.
Chairs: L. van den Engel-Hoek; P. Fichaux-Bourin

PPG  PHYSICAL AND COMPENSATORY TREATMENTS
Chairs: M. Walshe; E. Michou

PPH:  COMPLICATIONS AND DYSPHAGIA IN CHILDREN
Chairs: ML. Huckabee; P. Pokieser

16:30-17:30  Parallel session 08A. Free papers, Head and Neck Cancer and Physical Rehabilitation  Auditorium - Room J
Chair: G. Lawson; E. Verin

OP8A.1 TONGUE STRENGTHENING EXERCISES (TSE) DURING 8 WEEKS: DOES LEVEL OF RESISTANCE (LR) MATTER?
G. Van Nuffelen; L. Van den Steen; J. Vanderwegen; C. Guns; R. Elen; M. De Bodt; G. Van Nuffelen (Belgium)
Scientific Programme

OP8A.2 EVALUATION OF LONG TERM (10-YEARS+) DYSPHAGIA AND TRISMUS IN PATIENTS TREATED WITH CONCURRENT CHEMO-RADIOTHERAPY FOR ADVANCED HEAD AND NECK CANCER
S.A.C. Kraaijenga; I.M. Oskam; L. van der Molen; O. Hamming-Vrieze; F.J.M. Hilgers; M.W.M. van den Brekel (Netherlands)

OP8A.3 ENDOLUMENAL FUNCTIONAL LUMEN IMAGING PROBE (ENDOFLIP) PROVIDES A VALID AND SENSITIVE DIRECT MEASUREMENT OF THE UPPER OESOPHAGEAL SPHINCTER COMPLIANCE IN PATIENTS WITH RADIOTHERAPY-RELATED DYSPHAGIA
M. Szczesniak; P. Wu; J. Maclean; J. Graham; L. Choo; T. Zhang; I. Cook (Australia)

OP8A.4 INFLUENCE OF EXTERNAL SUBGLOTTIC AIR PRESSURE (ESAP) ON DYSPHAGIC TRACHEOSTOMIZED PATIENTS
M. Kothari; K. Bjerrum; L. Heidemann; J.F. Nielsen (Denmark)

OP8A.5 HYOID BONE DISPLACEMENT AS PARAMETER FOR SWALLOWING IMPAIRMENT IN PATIENTS TREATED FOR ADVANCED HEAD AND NECK CANCER
S.A.C. Kraaijenga; L. van der Molen; W.D. Heemsbergen; G. Remmerswaal; F.J.M. Hilgers; M.W.M. van den Brekel (Netherlands)

16:30 - 17:30       Parallel session 08B. Free papers, Dysphagia in Children
Symposium room - Room A
Chairs: N. Demir, P. Fichaux-Bourin

OP8B.1 THE PEDIATRIC EATING ASSESSMENT TOOL (PEDI-EAT-10)
N. Demir (Turkey); S. Serel(Turkey); G. Sorgun (Turkey); H.E. Kilinc (Turkey); A.A. Karaduman (Turkey); P.C. Belafsky (United States)

OP8B.2 MASTICATION PROBLEMS IN CONSECUTIVE STAGES OF DUCHENNE MUSCULAR DYSTROPHY
L. van den Engel-Hoek; S.A.F. de Groot; C.E. Erasmus; I.J.M. de Groot (Netherlands)

OP8B.3 THE 6-MINUTE MASTICATION TEST
L. van den Engel-Hoek; S. Knuijt; M. van Gerven; M.C.H. Janssen; I.J.M. de Groot (Netherlands)

OP8B.4 RELIABILITY AND USABILITY OF THE TRANSLATED EATING AND DRINKING ABILITY CLASSIFICATION SYSTEM (EDACS) IN CHILDREN WITH CEREBRAL PALSY
K. van Hulst (Netherlands); D. Snik(Netherlands); P. Jongerius(Netherlands); D. Sellers (United Kingdom); A. Geurts (Netherlands); C. Erasmus(Netherlands)
OP8B.5 MAXIMAL ISOMETRIC PRESSURE (MIP) OF THE TONGUE IN TYPICALLY DEVELOPING BELGIAN CHILDREN: INFLUENCE OF TONGUE BULB POSITION, AGE, GENDER, ORDER AND VISUAL FEEDBACK

J. Vanderwegen; G. Van Nuffelen; R. Elen (Belgium)

17:30 - 18:00 Session 09. Postures and Manoeuvres
Chairs: R. Speyer; M. Huckabee
Invited speaker: Roberta Gonçalves, Brazil

18:00-19:00 Industry symposium 4

SATURDAY, OCTOBER 03

08:00-09:00 ESSD General Assembly

09:00 - 10:30 Session 10. Free papers, Physiology, neurophysiology and neurorehabilitation

S. Kumar; J. Park

OP10.1 LOCALIZATION AND EXPRESSION OF TRPV1 AND TRPA1 IN THE MUCOSA OF THE HUMAN OROPHARYNX AND LARYNX
D. Alvarez-Berdugo; L. Rofes; R. Farré; J.F. Casamitjana; A. Enrique; J. Chamizo; P. Clavé (Spain)

OP10.2 EFFECTS OF 5HZ REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION (RTMS) ON SWALLOWING FUNCTIONS OF DYSPHAGIC INDIVIDUALS
K.Yi. Cheng; M.K.K. Chan; D. Pu; C.S. Wong; T.F.R. Cheung; S.W.L. Li; M.Y.K. Chiu (Hong Kong)

OP10.3 EFFECT OF SUBMENTAL SENSITIVE TRANSCUTANEOUS ELECTRICAL STIMULATION ON VIRTUAL LESION OF THE OROPHARYNGEAL CORTEX
E. Cugy; A. Leroi; J. Kerouac-Laplante; P. Dehail; P. Joseph; E. Gerardin; J. Marie; E. Verin (France)
OP10.4 ENHANCING DYPHAGIA REHABILITATION IN TRACHEOTOMIZED STROKE PATIENTS WITH ELECTRICAL PHARYNGEAL STIMULATION
S. Suntrup; T. Marian; J. Schröder; I. Suttrup; P. Muhle; S. Oelenberg; C. Hamacher; T. Warnecke; R. Dziewas (Germany)

OP10.5 TASK-CONCURRENT ANODAL TDCS MODULATES BILateral PLasticity of the human suprahyoid Motor Cortex
S. Zhao; Z. Dou; X. Wei; J. Li; H. He (China)

OP10.6 VARIABILITY IN CORTICAL EXCITABILITY FOLLOWING REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION PARADIGMS OF THE INTACT PHARYNGEAL MOTOR CORTEX
A. Raginis-Zborowska; E. Michou; N. Pendleton; W. Ollier; S. Hamdy (United Kingdom)

OP10.7 NEUROPHYSIOLOGICAL EFFECTS OF TWO-WEEK TREATMENT WITH ORAL CAPSAICIN IN OLDER PATIENTS WITH OROPHARYNGEAL DYSPHAGIA
L. Rofes; O. Ortega; N. Vilardell; V. Arreola; M. Martin; L. Mundet; P. Clavé (Spain)

10:30-11:00 Coffee break
Exhibition Hall

Symposium 5 FEES and ViP symposium
Symposium room - Room A
Chairs: A. Schindler, D. Farneti
Speakers: Rainer Dziewas, Germany; Ingo Herrmann, Germany; Christoph Arens, Germany

11:00 - 11:30 Session 11. Neurorehabilitation in Post-stroke
Auditorium - Room J
Chairs: G. Ickenstein; I. Fujishima
Invited speaker: Philip Bath, UK

11:30 - 13:00 Session 12. Free papers, Dysphagia in older persons, stroke and neurodegenerative diseases
Auditorium - Room J
Chairs: R. Dziewas; S. Hamdy
OP12.1 THE EFFECT OF A DYSPHAGIA MANAGEMENT PROTOCOL ON PNEUMONIA RATES IN PATIENTS WITH ACUTE STROKE
S. Davies; M. Huckabee (New Zealand)

OP12.2 EFFECT OF A MINIMAL-MASSIVE INTERVENTION ON HOSPITALIZED OLDER PATIENTS WITH OROPHARYNGEAL DYSPHAGIA, PRELIMINARY RESULTS
A. Martín Martínez; O. Ortega Fernández; M. Roca Fontbona; M. Arus Figar; P. Clavé Civit (Spain)

OP12.3 LARYNGOPHARYNGEAL SENSORY DEFICIT IN PATIENTS WITH MCA-INFARCTION: LATERALIZATION AND RELATION TO OVERALL DYSPHAGIA SEVERITY
T. Marian; J. Schröder; P. Muhle; I. Suttrup; S. Oelenberg; C. Hamacher; T. Warnecke; S. Suntrup; R. Dziewas (Germany)

OP12.4 VOLUNTARY COUGH AIRFLOW PREDICTS PENETRATION/ASPIRATION STATUS IN AMYOTROPHIC LATERAL SCLEROSIS.
E. Plowman; R. Robison; L. Tabor; S. Watts; J. Gaziano (United States)

OP12.5 HIGHWAY TO DECANULATION: A BI-CENTER ANALYSIS OF DECANULATION RATES AND CAUSES OF WEANING FAILURE.
C. Ledl; E. Wagner-Sonntag (Germany)

OP12.6 SWALLOWING TREATMENT USING ELECTRICAL PHARYNGEAL STIMULATION (STEPS) AFTER STROKE: A RANDOMISED CONTROLLED PHASE III TRIAL
P.M. Bath (U.K.); P. Scutt (U.K.); J. Love (U.K.); A. Yellowles (U.K.); P. Clavé (Spain); D. Cohen (U.K.); R. Dziewas (Germany); H.K. Iversen (Denmark); H. Soda (Germany); V. Woisard (France); S. Hamdy (U.K.); for the STEPS Investigators (U.K.)

OP12.7 NUTRITIONAL STATUS OF OLDER PATIENTS WITH OROPHARYNGEAL DYSPHAGIA IN A CHRONIC VERSUS AN ACUTE CLINICAL SETTING
C. Silvia; M. Roca; A. Costa; V. Arreola; O. Ortega; E. Palomera; M. Serra-Prat; P. Clavé (Spain)

OP12.8 REVERSIBLE OROPHARYNGEAL DYSPHAGIA IN ELDERLY PATIENTS ADMITTED TO A HOSPITAL
S. Casas; V. Cabrejo; S. de la Fuente; V. Isern; E. Pérez; M. Laya; C. Sabbagh; M.M. Lluch; L. Ferrer (Spain)
### Scientific Programme

**SUNDAY, OCTOBER 03**

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<th>Time</th>
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<tr>
<td>13:00 - 14:30</td>
<td><strong>Lunch</strong></td>
<td><strong>Exhibition Hall</strong></td>
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<td>13:30 - 14:30</td>
<td><strong>S6 Industry symposium</strong></td>
<td><strong>Auditorium</strong></td>
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| 14:30 - 15:00 | **Session 13. White paper on Dysphagia in Older People**  
Chairs: R. Speyer, P. Clavé  
Invited speaker: David Smithard, UK, Jesus Mateos, Spain, P. Clavé, Spain | **Auditorium - Room J** |
| 15:00 - 15:30 | **Session 14. Oral Health**                                          | **Auditorium - Room J**  
Chairs: P. Clavé, Spain; D. Smithard  
Invited speaker: Koichiro Matsuo, Japan |
| 15:30 - 16:00 | **Parallel session 15. Poster viewing**  
PPJ SCREENING AND CLINICAL ASSESSMENT 2  
*Chairs: M. Walshe; M. Bülow*  
PPK INSTRUMENTAL ASSESSMENT  
*Chairs: P. Pokieser; O. Ekberg*  
PPL PHYSIOLOGY AND NEUROPHYSIOLOGY  
*Chairs: É. Verin; E. Michou*  
PPM DYSPHAGIA IN STROKE AND BRAIN DAMAGE  
*Chairs: D. Smithard; S. Suntrup*  
PPN DYSPHAGIA IN NEURODEGENERATIVE DISEASES  
*Chairs: A. Schindler; P. Clavé* | **Exhibition Hall**    |
Scientific Programme

SATURDAY, OCTOBER 03

PPP  DYSPHAGIA IN GERIATRIC PATIENTS
      Chairs: J. Mateos-Nozal, Y. Inamoto

PPQ  DYSPHAGIA AFTER HNC TREATMENT AND MUSCLE EXCISION
      Chairs: V. Woisard; G. Lawson

PPQ  OTHER
      Chairs: G. Malandraki; L. Rofes

16:00-16:30  Coffee break

16:30 - 17:00  Session 16. Evaluation of Oropharyngeal Dysphagia with FEES
               Chairs: D. Farneti; V. Woisard
               Invited speaker: Susan Langmore, Canada

17:00 - 17:30  Session 17. Swallowing Recovery in Head and Neck Cancer
               Chairs: A. Schindler; G. Lawson
               Invited speaker: Jan Lewin, USA

17:30-18:00  Closing ceremony and Awards
Floor Plan

PALAU DE CONGRESSOS DE CATALUNYA
LEVEL -1

AUDITORIUM
ROOM J

CLOAKROOM

K1
K2
K3
K4

ESSD

SPEAKERS’ READY ROOM

ENTRANCE FROM THE HOTEL

MAIN ENTRANCE

STANDS

POSTERS

DRINKS
FOOD
COCKTAIL TABLES

EXHIBITORS:
1. Nutricia
2. Nestlé
3. IOPI Medical
5. Phagenesis
6. Fresenius Kabi
7. Protip Medical
10. DJO
11. Pentax
12. Siö Drinks
13. ESSD
14. Karl Storz

ESSD 2015
BARCELONA
1-3 OCTOBER 2015
Oral Presentations

All speakers must download their presentations in the speaker’s ready room at least 3 hours before their sessions, unless they have sent them to the scientific secretariat in advance. Presenters cannot use their personal computers for their presentations. We recommend using Microsoft to ensure compatibility. There will be a technician in the room who can help you.

Speakers’ ready room

Opening times:
Thursday 1 October, 07:30 - 18:00
Friday 2 October, 07:30 - 18:00
Saturday 3 October, 08:00 - 16:30

ESSD films the invited lectures and uses the videos as educational material available to ESSD members through the website (password controlled). We ask all invited lecturers to sign the form giving permission for this use of their lecture.

Invited lecturers are also asked to sign the conflict of interest form.

Poster Presentations

All posters will be displayed all day Friday and Saturday. Posters must be mounted before the morning coffee break on Friday and removed after the afternoon coffee break on Saturday. Posters that are not removed will be discarded.
Delegates using the poster service Postersessiononline will pick up their poster at the registration.
Poster presenters must send a pdf of their poster either to Postersessiononline or to the scientific secretariat executiveofficer@myessd.org. A 2-3 minute audio file describing the poster can also be sent (optional), these files will be available through a QR code beside the poster and after on the ESSD website members’ section.

Presenters must be one of the authors of the study which must be original. Abstracts are published in Dysphagia Journal following the congress and are put on the ESSD website. Presenters must have permission to show all their images and data, it is common practice for other delegates to photograph and record interesting presentations.

Abstract book

Abstracts presented in the congress are available at the back of the programme and are listed in order of presentation. There is an author index at the end.
Accreditation

A certificate of attendance can be picked up from the registration desk at the end of the congress. This year ESSD has applied for CME credits from EACCME of the U.E.M.S. European board of accreditation and the congress and precongress course have been designated 17 CME credits. At the time of printing, the CCFCPS, Catalan board of accreditation, had not decided the number of credits they would award. Delegates who wish to be accredited must sign in and out of sessions to prove attendance.

Language

The official language of the congress is English. Simultaneous translation is available into Spanish. Headphones can be picked up at reception and must be returned at the end of the day. Please put the volume at the minimum you can comfortably hear so as not to disturb the surrounding delegates.

Congress App

This year we have contracted an app to access all sessions, abstracts, exhibitors & maps. Create your personalised Congress programme. Find practical Congress information. Use the chat to ask questions to speakers at the end of the sessions. Before first use, you’ll need to download the latest conference data. Afterwards, you can use most of the app offline although updates will be available regularly before and during the conference. If you have any difficulties please ask the assistants or the Speakers Ready room. Details about the app are also available on the congress website www.essd2015.org.

Registration

On-site registration is available but places are limited and material cannot be guaranteed. Delegate registration includes:

- Access to all congress sessions and commercial exhibition
- Delegate bag including all congress materials and a name badge
- Lunches and coffee breaks
- Welcome reception on Thursday 1 October at 18h at the Palau de Congressos de Catalunya.

Registration and secretariat desk will be open:

- Thursday 1 October, 07:00 -19:00
- Friday 2 October, 07:00 -19:00
- Saturday 3 October, 08:00 -18:00
Alda, 54, cares for her mother who suffers from dysphagia following a stroke in 2012.

Patients with dysphagia may require a texture-modified diet to ensure a safer swallow.

Nutilis Clear is an advanced thickening powder that does not change the taste, transparency or appearance of thickened foods or drinks, and is amylase resistant so thickened foods and drinks retain consistency, helping dysphagia patients with a safer swallow.

Preparing foods and drinks with Nutilis Clear helps dysphagia patients to not only take in adequate nutrition and hydration, but to also relax and enjoy mealtimes again.

Nutilis is a food for special purposes for the dietary management of dysphagia and must be used under medical supervision.
CONGRESS VENUE

Palau de Congressos de Catalunya (PCC)
Av. Diagonal, 661-671
08028 Barcelona
Telephone: +34 93 364 44 00
www.pcongresos.com

TRANSPORT

How to get to Palau de Congressos de Catalunya

From the airport: Barcelona Airport El Prat (13 km)

- **By train/metro:** The train station is next to the Airport, Terminal 2. There are shuttle buses from Terminal 1 to 2. Take the train as far as Sants Estació, the city’s main train station. Once you arrive, take the subway train (Metro), Line 3 (green line) and get off at the Zona Universitaria stop (2 minutes walking distance from the Hotel). (Takes approximately 40 minutes.) Train to Sants costs 4.10€, Metro costs 2.15€ single ticket, T-10 9.95€ (10 tickets, can be used for multiple people and on buses and metro)

- **By Aerobus:** The Aerobus, express airport bus service, links the airport with key points of the city. The terminal for the Aerobus is just in front of each terminal. In order to get to the Hotel you must get off at the Plaça España (first stop within the city). Take the subway Line 3 from here (green line) and get off at the Zona Universitaria station (2 minutes walk from the Hotel). (Overall duration of trip: approximately 35 minutes.) Aerobus costs €5.90 single ticket: http://www.aerobusbcn.com, Metro costs 2.15€ single ticket, T-10 9.95€ (10 tickets, can be used for multiple people and on buses and metro)

- **By taxi,** yellow and black, 1-3 people, costs about 30€ (metre plus required supplements for leaving the airport and carrying luggage). Takes about 18 min

- **By limousine,** 1-3 people: from airport on request (88€)

- **By minivan,** 4-6 people: from airport on request (112€)
General information

From the city centre (Plaça Catalunya)

- **Metro Linea 3** (green line) 24 min from Plaça Catalunya to Zona Universitat (last stop)

- **Bus 67**, Plaça Catalunya to Zona Universitat, 28 min

Distances

- Nearly 6 km from Plaça Catalunya.
- 13 km from the airport (15 minutes by taxi)
- 2 minutes walk to the nearest Metro station (Line 3, green), bus (67) and tram.
- 3 kilometers from Sants, the city's main train station.

BARCELONA

Situated on the shores of the Mediterranean Sea and backed by hills, Barcelona is a crowded, busy, attractive city. Two thousand years of history and a rich, vibrant culture have resulted in plenty to do and see. The climate and Mediterranean way of life means there is always a lot going on in the streets, squares, parks and seafront at almost all hours of the day and night. It has become a hallmark of fashion, fine dining, architectural wonders and cultural activity of all kinds. Despite its size, it is easy to move around by public transport or on foot.

WEATHER

The city of Barcelona, located in the Mediterranean shore, enjoys a privileged mild climate. The average temperature in October is around 21 °C.

VISA

Spain is member of the European Union and most visitors can enter without a Visa.

ELECTRICITY

The type of voltage in Spain is 220 volts, 50HZ.

CURRENCY

The currency in Barcelona is the Euro (EUR / €).
General information

BANK
Schedules may vary between banks, but most of them open from Monday to Friday from 08:15-14:15. Most banks have ATM in the street or foyer.

CREDIT CARDS
Almost all establishments accept payments by credit card. The main credit cards can also be used to obtain cash from an ATM. ATMs are generally available 24h a day.

SHOPPING
The opening hours for shopping establishments are from Monday to Saturday from around 09:30 to 13:30 and 16:30 to 20:00. Big shopping centres do not close at midday. The main shopping is along Diagonal from the Congress Centre and down Passeig de Gracia and Rambla de Catalunya.

VISITING THE CITY
Barcelona has many attractions for all tastes. Some of the most popular are Antoni Gaudí’s buildings many of which are World Heritage such as Sagrada Familia, La Pedrera, Casa Batlló and Park Güell. There are also exceptional museums such as the Picasso Museum, Joan Miró Foundation, the finest collection of Romanic art at the Museu Nacional d’Art de Catalunya and for football fans, Camp Nou, Barça’s famous stadium and museum. Passeig de Gracia, Rambla Catalunya, the Rambla and the Gothic Quarter are choice spots for wandering around. There are hop on Tourist Buses [www.barcelonabusturistic.cat/en](http://www.barcelonabusturistic.cat/en) and Daily Tours from Plaça Catalunya [http://www.barcelonaguidebureau.com/daily-tours](http://www.barcelonaguidebureau.com/daily-tours).

Phone numbers of interest
- Emergency phone number (police, fire ambulance): 112
- Medical emergencies: 061
- Palau de Congressos de Catalunya: 93 364 44 00
- Taxi (one of the companies), TAXI ECOLOGIC BARCELONA: 93 278 30 00
Symposium: PES; treating the cause of dysphagia, the evidence so far
Thursday 1 October
17:30–18:15

Through a series of clinical research trials including RCTs, Pharyngeal Electrical Stimulation (PES) has shown improvements in neurogenic dysphagia impairment.1,2

**Phagenyx®** PES creates neuro-sensory input, ‘kick-starting’ re-organisation of the brain to neurologically re-activate swallowing.


RCT=randomized controlled trial

COMING AND VISIT US AT
**STAND 5**
IN THE EXHIBITION HALL

www.phagenesis.com
For more information call 0161 820 4525 or email marketing@phagenesis.com
Welcome reception

The welcome reception will be held in the congress venue Palau de Congressos de Catalunya in the Exhibition Hall at 18:15 on Thursday, 1 October.

Before the welcome reception, delegates can register and pick up their bags and badges for the congress, speakers and presenters can download their presentations and put up their posters.

Congress dinner

The dinner is on Friday 2nd October at 20:00 in the Asador de Aranda Tibidabo, a lovely building from the early 1900s, the famous Modernisme of Barcelona.

There will be music and dancing on the terrace, weather permitting. Tickets are 60 euros for everyone, delegates, invited speakers and board members.

Please tell us if you have special dietary requirements, the speciality of the house is lamb, so if you prefer a vegetarian dish or fish let us know in advance.
Industry sponsored symposiums

THURSDAY 1 OCTOBER

13:30-14:00  
Symposium 1.  
DJO sponsored symposium: “Presentation of Chattanooga VitalStim Plus: next generation electrical stimulation device for dysphagia treatment”. This new device comes with color video and graphical interface and incorporates innovative technologies & state-of-the-art sEMG  
Valère Vriz  
Vice President International Market Development, DJO Global

17:30-18:15  
Symposium 2.  
Phagenesis sponsored symposium: “Pharyngeal Electrical Stimulation (PES); treating the cause of dysphagia, the evidence so far”  
Chair: Professor Shaheen Hamdy  
Professor of Neurogastroenterology  
Salford Royal Hospital  

PES for Post Stroke Dysphagia; The STEPS Trial  
Professor Philip Bath  
Professor of Stroke Medicine  
Nottingham University Hospital Trust  

STEPS Learning points  
Mary McFarlane  
Principal Speech and Language Therapist,  
Northwick Park Hospital, North West London Hospitals Trust  

Promising evidence in PES & outlook  
Rainer Dziewas  
Professor of Neurology  
Head of Neurological Intensive Case Unit and Stroke Unit  
University Hospital of Münster
## Industry sponsored symposiums

### FRIDAY 2 OCTOBER

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<th>Symposium Room</th>
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<tr>
<td>13:30-14:30</td>
<td>Fresenius-Kabi sponsored symposium: &quot;Managing the Patient with Dysphagia: From therapeutic strategies to practical solutions&quot;</td>
<td>Symposium Room</td>
<td>Room A</td>
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<td>Chairperson: Prof. Olle Ekberg, Sweden</td>
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<tr>
<td>13:30-13:40</td>
<td>Introduction</td>
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<td></td>
<td>Prof. Olle Ekberg, Sweden</td>
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<td>13:40-14:00</td>
<td>MMI – A new concept for dysphagia management</td>
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<td>Prof. Pere Clavé, Spain</td>
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<td>14.00-14:20</td>
<td>Nutritional management of dysphagia - practical insights</td>
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<td>Dr. Rosa Burgos Pelaez, Spain</td>
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<td>14:20-14:30</td>
<td>Q &amp; A session and concluding remarks</td>
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<td></td>
<td>Prof. Olle Ekberg, Sweden</td>
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<th>Time</th>
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<th>Auditorium Room</th>
<th>Room J</th>
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<tbody>
<tr>
<td>18:00-19:00</td>
<td>Nestlé Nutrition Institute sponsored symposium: &quot;Care of Swallowing Difficulties: Practicalities of safe and appealing nutrition&quot;</td>
<td>Auditorium Room</td>
<td>Room J</td>
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<tr>
<td>18:00-18:25</td>
<td>Science-Based Interventions for Dysphagia Management</td>
<td>Auditorium Room</td>
<td>Room J</td>
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<td>Dr Pere Clavé, MD, PhD (Spain)</td>
<td>Auditorium Room</td>
<td>Room J</td>
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<tr>
<td>18:25-18:50</td>
<td>Dining with Dignity- Raising the Standard</td>
<td>Auditorium Room</td>
<td>Room J</td>
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<td>Chef Gary Brailsford (UK)</td>
<td>Auditorium Room</td>
<td>Room J</td>
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<tr>
<td>18:50-19:00</td>
<td>Q&amp;A</td>
<td>Auditorium Room</td>
<td>Room J</td>
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SATURDAY 3 OCTOBER

10:30-11:00  **Symposium 5.**  
FEES and Videopanendoscopy symposium  

10:30-10:45  Flexible endoscopic evaluation of swallowing (FEES) for neurogenic dysphagia: training curriculum of the German Society of Neurology and the German Stroke Society  
*Rainer Dziewas*

10:45-11:00  The new techniques in endoscopy of the upper aerodigestive tract’s function  
*Ingo F. Herrmann, Reflux-Center, Düsseldorf - Germany*  
*Christoph Arens, ENT-Department, OvG-University, Magdeburg - Germany*

13:30-14:30  **Symposium 6.**  
Nutricia sponsored symposium: “Better Compliance for Better Outcomes”  

13:30  Cost of illness of oro-pharyngeal dysphagia after stroke from a hospital perspective for the Spanish setting  
*Prof. Pere Clave, ESSD President*

13:50  Stroke related dysphagia – diagnostic approach and nutritional management  
*Prof. Rainer Dziewas, Neurologist*

14:10  Making Dysphagia Advice Easier To Swallow: Improving Compliance in NHS Highland Nursing Homes  
*Lisa Fox, Senior Speech and Language Therapist*

14:30  Questions and Close
**GOLD SPONSORS**

**Fresenius Kabi** is a global health care company that specialises in lifesaving medicines and technologies for infusion, transfusion and clinical nutrition. The company’s products and services are used to help care for critically and chronically ill patients. Fresenius Kabi’s product portfolio comprises a comprehensive range of I.V. generic drugs, infusion therapies and clinical nutrition products as well as the medical devices for administering these products. Within transfusion technologies, Fresenius Kabi offers products for whole blood and blood components collection and processing as well as for transfusion medicine and cell therapies. With its corporate philosophy of “caring for life”, the company is committed to putting essential medicines and technologies in the hands of people who help patients and finding the best answers to the challenges they face.

**Nestlé Health Science** makes a positive difference to the nutritional health, well-being and quality of life of people through innovative, medically recognised nutritional solutions. Our solutions help optimise the nutritional intake of people who aim to combat disease, recover or stay healthy. Our range addresses various nutritional needs and related services including patient and healthcare professional education and training. Innovations are developed with Nestlé Institute of Health Sciences and the Nestlé R&D network. The Institute enables a deeper understanding of interactions between chronic disease, lifestyle and nutrition, which enables Nestlé Health Science to develop new products.

**Nutricia** is a specialised healthcare unit of Danone, one of the fastest-growing food companies in the world. Nutricia expands and completes Danone’s mission to bring health through food to as many people as possible, by focusing on support for vulnerable people who are at nutritional risk for health reasons. Nutricia develops innovative, science-based nutrition concepts that deliver proven benefits and better clinical outcomes for patients, and so help to lower the overall cost of their care. Working in partnership with doctors, health care professionals, and caregivers, the company offers a very broad range of products for many conditions and age groups.

**SILVER SPONSORS**

**Chattanooga** is the world’s largest manufacturer of rehabilitation equipment for treating musculoskeletal, neurological and soft tissue disorders. For over six decades, Chattanooga has set a benchmark for leadership, reliability and excellence. Our products contribute to better treatment outcomes in hospitals, clinics and home settings worldwide. We lead the physiotherapy industry by example.
and, through continuous innovation, provide real world solutions for clinicians and their patients. Chattanooga’s VitalStim Therapy is being used in rehabilitation hospitals, acute care facilities and freestanding clinics worldwide. In these facilities, it is helping speech-language pathologists (SLPs) retrain a large percentage of the patients to swallow. Successful VitalStim Therapy is getting patients off PEG tubes or thickened liquids and back to the joys of eating. VitalStim Therapy is a specialized form of neuromuscular electrical stimulation (NMES) designed to treat Dysphagia through muscle re-education.

We are delighted to be demonstrating the new Chattanooga VitalStim device at ESSD 2015. This next generation device comes with color video and graphical interface and incorporates innovative technologies, state-of-the-art sEMG and clinically proven treatment protocols.

DJO Global is a global developer, manufacturer and distributor of high-quality medical devices that provide solutions for musculoskeletal health, vascular health and pain management. Our company message is “Motion is Medicine” and our portfolio of products addresses the continuum of patient care from injury prevention through to rehabilitation after surgery, injury or degenerative disease, therefore enabling people to regain or maintain their natural motion. For additional information on DJO Global, please visit www.DJOglobal.com

**PENTAX Medical**

The technologies developed at the former KayPENTAX are now integrated with PENTAX Medical endoscopes and processors to provide a full range of ENT and speech pathology products. With 30 years combined experience developing tools for the speech and voice community, PENTAX Medical now offers complete, quality solutions for otolaryngologists and speech language pathologists. These include renowned digital stroboscopy systems, cost-effective general endoscopy systems, swallowing and speech assessment, and therapeutic endoscopes. From state-of the art endoscopy systems that include video naso-pharyngo-laryngoscopes to portable fiber naso-pharyngo-laryngoscopes, PENTAX Medical provides a broad array of well-engineered, reliable products for improved patient care.

**Phagenesis Ltd** is committed to transforming the lives of people with dysphagia, using revolutionary treatments developed through a commitment to scientific and clinical excellence. The first product to be launched is Phagenyx. Phagenyx is a treatment for neurogenic dysphagia that uses Pharyngeal Electrical Stimulation (PES) to restore neurological control and in turn improve the swallow function. Phagenyx offers a unique opportunity to treat the cause of dysphagia, thereby reducing the risk of complications and associated costs and improving outcomes. The treatment is based on over 20 years of research and development.
EXHIBITORS

The Iowa Oral Performance Instrument (IOPI) objectively measures tongue and lip strength and provides biofeedback for oral motor exercise. These measures aid professionals in the treatment and study of dysphagia by objectively documenting deficits that justify treatment, diagnostically differentiating between muscle weakness and problems of motor control, and motivating patients by showing them their progress from muscle exercise therapy.

Karl Storz is a renowned manufacturer that is well established in all fields of endoscopy and can be considered as market leader in rigid endoscopy. The still family held company was founded in 1945 in Tuttlingen, Germany, and has grown to one with a worldwide presence and 5800 employees. KARL STORZ offers a range of both rigid and flexible endoscopes for a broad variety of applications. Today’s product range also includes fully integrated concepts for the OR and servicing.

Protip Medical is dedicated to developing innovative solutions for patients suffering from larynx disorders. PROTIP Medical introduces “NewBreez”, an intralaryngeal prosthesis intended to treat patients with intractable aspiration due to progressive neurologic disease or debilitating injury secondary to stroke, trauma, or surgery.

Slō Drinks. Those with dysphagia need drinks that flow slowly: and they are their carers want a simple way to make them. Slō Drinks are therefore formulated to help. Each sachet contains exactly the right amount of thickener to change the consistency of a drink to Stage 1: Mildly Thick or Stage 2: Moderately Thick. Carers simply mix the contents of a sachet with a drink to change it in to a Slō Drink and make it safer to swallow. Slō Drinks are available for all patient needs: Hydration, Nutrition, Medication and Recreation.

Acknowledgements
ESSD and the Local Organizing Committee would like to thank the gold sponsors Fresenius Kabi, Nutricia and Nestlé Health Science, the silver sponsors DJO, Phagenesis and Pentax Medical and all the exhibitors and collaborators for their participation in the congress.
Nestlé Health Science, nutritional solutions to improve dysphagia patients’ quality of life
OP2.1 MEASUREMENT OF OXYGEN DESATURATION IS NOT USEFUL FOR THE DETECTION OF ASPIRATION IN DYSPHAGIC STROKE PATIENTS

T. Marian; J. Schröder; P. Muhle; L. Suttrup; S. Gilenberg; C. Hamacher; T. Warnecke; S. Suntrup; R. Dzieiewas/University Hospital Münster, Department of Neurology, Germany

Introduction: Dysphagia is one of the most dangerous symptoms of acute stroke. Various screening tools have been suggested for the early detection of this condition. In spite of conflicting results, measurement of oxygen saturation (SpO2) during clinical swallowing assessment is still recommended by different national guidelines as screening tool with a decline in SpO2 ≥ 2% usually being regarded as marker of aspiration. This paper assesses the sensitivity of SpO2 measurement to evaluate the aspiration risk in acute stroke patients.

Material & Methods: 50 acute stroke patients with moderate to severe dysphagia were included in this study. In all patients, FEES was performed according to a standardized protocol. Blinded to the results of FEES SpO2 was monitored simultaneously. The amount of desaturation during/after swallows with aspiration was compared to the amount of desaturation during/after swallows without aspiration in each patient. The extent of aspiration and cough strength were assessed qualitatively. Results: In each subject one swallow with and one swallow without aspiration was analyzed. Overall, aspiration seen in FEES was related to a minor decline in SpO2 (mean SpO2 without aspiration = 95.54 (± 2.7) % vs. mean SpO2 with aspiration = 95.28 (± 2.7) %). However, a relevant desaturation ≥2% occurred only in 5 patients during/after aspiration. There was no correlation between the extent of aspiration or cough strength and SpO2-levels. Conclusions: According to this study SpO2-measurement is not a suitable screening tool to detect aspiration in stroke patients.

OP2.2 THE DIAGNOSTIC ACCURACY OF THE MODIFIED EVAN’S BLUE DYE TEST IN DETECTING ASPIRATION IN PATIENTS WITH TRACHEOSTOMY: A SYSTEMATIC REVIEW

Šibylle Béchet; F. Hilt; M. Walshe/Trinity College Dublin, Ireland; The Adelaide and Meath Hospital, Dublin, Ireland

Introduction: Oropharyngeal aspiration (OPA) is a common occurrence in patients with tracheostomy, leading to pulmonary complications. Although instrumental assessment is considered most accurate in evaluating the swallowing function, it is often unavailable. Thus clinical practice would highly benefit from an easily administered bedside procedure for the assessment of tracheostomised patients, such as the Modified Evans Blue Dye Test (MEBDT). However, studies evaluating the diagnostic accuracy of the MEBDT reach conflicting results. The aim of this study is to determine the diagnostic accuracy of the MEBDT in detecting OPA in adults with tracheostomy. Design & Methods: A systematic review of studies evaluating the diagnostic accuracy of the MEBDT in detecting aspiration in adults with tracheostomy when compared to instrumental assessment has been carried out. For this purpose, the search strategy incorporated searching electronic databases, checking reference lists and retrieving unpublished data. Data of included studies was extracted and examined by three independent reviewers. The assessment of the methodological quality was performed using the QUADAS-2 tool. Results: Six studies met the inclusion criteria for this review. The studies presented significant disparities in study design and patient characteristics. Furthermore, high discrepancies in the administration of MEBDT across studies were noted. Therefore a meta-analysis was not considered appropriate. Sensitivity estimates varied widely across the studies. However, the studies emerge with overall high specificity values, ranging from 79% to 100%, thus suggesting that the MEBDT was generally better at excluding OPA. Conclusions: This review highlights the need for further research studies assessing the accuracy of the MEBDT, using a standardised and reliable procedure. Outcomes from such studies will update the current level of evidence in relation to MEBDT and consequently define best clinical practice.

OP2.3 COMPARISON OF COUGH REFLEX TESTING WITH VIDEOENDOSCOPIC ASSESSMENT IN EXTRUBATED ICU PATIENTS

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Introduction: Use of cough reflex testing (CRT) in the hospital setting is increasing. Orotracheal intubation is known to impair cough reflex, but the validity of CRT as a screening tool for silent aspiration in this population is unknown. Material & Methods: One hundred and six (79 male) ICU patients underwent CRT and videendoscopic evaluation of swallowing (VES) within 24 hours of extubation. A cough reflex threshold was established for each patient using concentrations of nebulised 0.4, 0.6 and 0.8mol/L citric acid. Results: Thirty-nine (37%) patients had an absent cough to CRT at all concentrations. Twenty-nine (27%) patients aspirated on VES, 14 (48%) without a cough response. Presence of cough to CRT did not correlate with VES observed aspiration or with cough response to aspiration. The sensitivity of CRT to predict silent aspiration did not exceed 17% in any condition. Less than one third of those with an absent cough to CRT at any concentration aspirated on VES. There was a significant correlation between intubation time and presence of aspiration on VES (r=0.013). Fifty-four percent of patients intubated for ≥48 hours aspirated on VES and 61% had an absent cough to CRT at 0.4 mol/L. There was no correlation between length of intubation, age, gender, diagnosis, indication for intubation, APACHE III score, morphine equivalent dose or time of testing.
post-extubation and silent aspiration on VES. Conclusion: ICU patients are at risk of aspiration in the 24 hours following extubation and impaired cough reflex is common. However, CRT is not a sensitive screening tool for identifying which of these patients are likely to silently aspirate. The majority of patients who have an absent cough response to CRT swallow without aspirating and routine use of CRT as a screening tool in the general ICU population would grossly over-identify dysphagia. Further research is needed to determine for which patients groups CRT is a valid screening tool.

OP2.4 THE DIAGNOSTIC ACCURACY OF THE MANN ASSESSMENT OF SWALLOWING ABILITY FOR DETECTING DYSPHAGIA AND ASPIRATION IN A COHORT OF PEOPLE WITH MULTIPLE SCLEROSIS

B.W. Woods; A.C. Constantiou; M.W. Walshe / Trinity College Dublin, Ireland

Aim: To determine the diagnostic accuracy of the Mann Assessment of Swallowing Ability (MASA) (Mann, 2002) to detect oropharyngeal dysphagia and aspiration in adults with Multiple Sclerosis. The MASA has been validated on people with stroke despite its use with other populations. Method: Using the MASA as the Index Test and videofluoroscopy (VFSS) as the Reference Standard, both MASA and VFSS were completed on 113 people with MS. Key parameters on the MASA were risk for developing dysphagia and aspiration (Ordinal Risk Rating – ORR), and the presence of dysphagia and aspiration (Total Numeric Score – TNS). These MASA ratings were compared with the Dysphagia Outcome Severity Scale (DOSS) and the Penetration/Aspiration Scale scores on VFSS. The accuracy of the MASA TNS and ORR in the diagnosis of dysphagia and aspiration was analysed in terms of its sensitivity and specificity. Results: MASA TNS correctly identified 7 people (sensitivity: 16%) as having dysphagia and 62 people (specificity: 90%) as having no dysphagia. MASA ORR correctly identified 36 people (sensitivity: 82%) as having dysphagia and 28 people (specificity: 41%) as having no dysphagia. MASA TNS detected 2 cases of aspiration (sensitivity: 50%) successfully, with no aspiration detected in 105 cases (specificity: 96%).

MASA ORR correctly identified 2 cases of aspiration (sensitivity: 50%) with no aspiration detected in 34 people (specificity: 31%). Conclusion: Overall findings suggest that MASA TNS provided marginally better values than MASA ORR for confirming a diagnosis of oropharyngeal dysphagia and aspiration. Examining all psychometric properties however (e.g. sensitivity, specificity, likelihood ratios, and positive and negative predictive values), reveals that both ORR and TNS scores did not have sufficient diagnostic accuracy to confidently support its use for the accurate detection of dysphagia or aspiration in this MS population.

 OP2.5 WIDE RANGE OF PRACTICE IN IDENTIFYING DYSPHAGIA AFTER ACUTE CERVICAL SPINAL CORD INJURY IN MULTI-DISCIPLINARY TEAMS

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Introduction Dysphagia following acute cervical spinal cord injury (CSCI) is associated with respiratory comorbidity and increased mortality. The causes are multi-factorial and clinical presentation is often subtle with few external motor signs. Early identification and management is recommended, and depends on staff knowledge and recognition of the issue. In order to understand early clinical decisions, an online survey was distributed to multi-disciplinary staff members at Intensive Care Units across the UK. Methods The survey comprised 35 multiple-choice questions covering 5 topics: tracheostomy and ventilator weaning, nutrition, swallowing, mouthcare and communication. It was distributed through critical care networks and professional bodies to Doctors, Nurses, Dietitians, Physiotherapist and Speech and Language Therapists (SLT) working in units which admit patients following acute CSCI. This presentation will focus specifically on responses about dysphagia screening, assessment and criteria for referral to SLT. Results Responses from 219 professionals from 87 hospitals were received. 33% nurses, 32% doctors, 16% physiotherapists, 14% SLTs and 5% Dietitians. Just over half of respondents worked in a Multi-Trauma Centre or Spinal Injury Unit. The remaining respondents worked in District General Hospitals or Teaching Hospitals. Responses demonstrated different roles for different professionals involved: Swallowing Screening by SLT (86%), nurses (54%) and some doctors (19%); 56% routine access to SLT services, 29% referred after a positive swallow screen result. 42% used a blue dye test and would refer after coughing (95%) or chest infection (89%). Conclusion Professionals in ICU have mixed understandings of dysphagia and its presentation in CSCI. Further training and education is needed alongside a specific acute care pathway for dysphagia management, respiratory and nutritional needs. This work has been done as part of a doctoral study. www.daisyproject.info.

OP2.6 THE DIAGNOSTIC ACCURACY OF CERVICAL AUSCULTATION IN THE IDENTIFICATION OF OROPHARYNGEAL ASPIRATION: A SYSTEMATIC REVIEW

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Introduction: Early identification of oropharyngeal aspiration (OPA) is necessary to reduce adverse health outcomes associated with dysphagia. Instrumental assessments such as videofluoroscopy (VFSS) and FEES are considered the most accurate in diagnosis of OPA. However these are not always available. Clinical non-instrumental tests are subjective and not diagnostically accurate for OPA. Cervical auscultation (CA), a method of listening to swallow sounds to detect OPA is a potential tool to augment clinical dysphagia evaluation. However, the
Evidence available to support CA in the diagnosis of OPA is variable. The aim of this study is to determine the diagnostic accuracy of CA in detecting OPA in adults and children presenting with oropharyngeal dysphagia.

Materials & Methods: A systematic review of studies evaluating the diagnostic accuracy of CA compared to VFSS and/or FEES in identifying OPA was carried out. Nine electronic databases were searched from inception to May 2015. Grey literature, citations and references of included studies were also searched to minimise publication bias. Data was extracted and analysed by three independent reviewers. The methodology of included studies was evaluated using the QUADAS-2 tool.

Results: Of the total 850 references identified, nine studies were considered eligible for inclusion. Studies varied greatly in design, included participants and administration of CA. For these reasons, a meta-analysis was not appropriate. The overall methodological quality was rated as “low”.

Introduction: The Eating Assessment Tool (EAT-10) by Belafsky et al. (2008) is a 10-item questionnaire used to identify patients at risk for oropharyngeal dysphagia. The EAT-10 has been described in literature as a valid and reliable tool with high internal consistency (Cronbach α = 0.96) and classifying much towards the overall construct. The Andrich thresholds of category probabilities demonstrated that respondents mostly used the “0” and “4”, but not the 1-3 item response categories, suggesting a need to collapse the 1-3 categories into a single category. Conclusions: When summarising the literature, the reliability and validity of the EAT-10 is considered to be sufficient to good; however, when using Rasch analysis, the individual EAT-10 items demonstrated limitations. Further analysis using ITR, of the underlying structure of the EAT-10 and its psychometric characteristics is recommended.

OP2.7 EAT-10: RELIABILITY AND VALIDITY USING RASCH ANALYSIS
R. Speyer¹; R. Cordier²; A. Schindler²; A. Karaduman³; M. Bulow⁴; P. Clave⁵ / ¹James Cook University, Australia; ²Curtin University, Australia; ³University of Milan, Italy; ⁴Hacettepe University, Turkey; ⁵Skane University Hospital Malmo, Sweden; ⁶Universitat Autonoma de Barcelona, Spain

Introduction: The Eating Assessment Tool (EAT-10) was designed to identify patients at risk of dysphagia. The EAT-10 has been described in literature as a valid and reliable tool with high internal consistency (Cronbach α = 0.96) and intra-item correlations ranging from 0.72 to 0.91. However, concerns have been raised about the optimal cut-off score to distinguish between persons being at risk or not being at risk of dysphagia. This study describes the reliability and validity of the EAT-10 using item response theory (IRT; Rasch analysis). Methods: EAT-10 data were gathered from four European countries involving 636 participants (M=69.9 years; SD = 13.9). All patients underwent videofluoroscopy to confirm oropharyngeal dysphagia (OD): 73.3% OD and 26.7% no OD. Data was analysed using Rasch analysis. Results: The overall item reliability of the EAT-10 was good (0.98); however, the person reliability was poor (0.55). The overall item and person fit statistics were within acceptable range (+1.3 MNSQ: -2 Z-STD). However, on an individual item fit level, item 9 had large positive outfit values (MNSQ = 1.48; Z-STD = 4.8), indicating unpredictable responses for this item. The items 4, 7 and 10 had large negative outfit values indicating item redundancy. The item-person dimensionality map confirmed this finding and also demonstrated that a large proportion of people are not mapped against easy to rate items. The overall Rasch model fit demonstrated high unexplained variance (51.7%) and principal component analysis showed low factor loadings for the items: 4 (0.04), 5 (-0.19), 7 (-0.11) and 9 (0.14); thus not contributing much towards the overall construct. The Andrich thresholds of category probabilities demonstrated that respondents mostly used the “0” and “4”, but not the 1-3 item response categories, suggesting a need to collapse the 1-3 categories into a single category. Conclusions: When summarising the literature, the reliability and validity of the EAT-10 is considered to be sufficient to good; however, when using Rasch analysis, the individual EAT-10 items demonstrated limitations. Further analysis using ITR, of the underlying structure of the EAT-10 and its psychometric characteristics is recommended.
Tracking technology provides indepth information into the process of interpreting VFSS and potential to become an educational tool for clinicians.

**OP4.2 TIMING PLAYS A MAJOR ROLE IN THE PATHOPHYSIOLOGY OF ASPIRATION**

C.M. Steele; V. Chak; A. Dhindsa; R.D. Drainim; A. Nagy; M. Peladeau-Pigeon; M. Tapson; S. Torreiter; T. Wolkin; A. Waito / Toronto Rehabilitation Institute, Canada

Introduction: A systematic review in 2012 pointed to the possibility that the timing events in swallowing play a critical role in the pathophysiology of aspiration. In particular, the length of time that the bolus is present in the pharynx while the laryngeal vestibule remains open and unprotected was identified as a parameter likely to capture risk of penetration-aspiration. In this study, we explored the relationship between swallow event timing and penetration-aspiration in a large prospective sample of adults undergoing videofluoroscopy. Material & Methods: Participants completed a standardized videofluoroscopy protocol involving 6 sips of 2% w/v thin liquid barium. Duplicate blinded ratings of penetration-aspiration and the timing of 7 key events in the pharyngeal phase of swallowing were obtained. Timing parameters for 756 thin liquid boluses (from 167 participants) were explored using linear mixed model ANOVAs with repeated measures to determine their association with penetration-aspiration scores ≥ 3. Results: Three parameters, all related to the timeliness of laryngeal vestibule closure, showed statistically significant differences (p < 0.05) between swallows with or without penetration-aspiration. These were: the amount of time the bolus was present below the ramus of mandible prior to laryngeal pharyngeal phase of swallowing were obtained. Timing parameters for 756 thin liquid boluses (from 167 participants) were explored using linear mixed model ANOVAs with repeated measures to determine their association with penetration-aspiration scores ≥ 3. Results: Three parameters, all related to the timeliness of laryngeal vestibule closure, showed statistically significant differences (p < 0.05) between swallows with or without penetration-aspiration. These were: the amount of time the bolus was present below the ramus of mandible prior to laryngeal vestibule closure; the interval between the onset of hyoid burst movement and laryngeal vestibule closure; and the interval between laryngeal vestibule closure and upper esophageal sphincter opening. Laryngeal vestibule closure duration did not differentiate safe from unsafe swallows. Conclusions: These data confirm that the timeliness of laryngeal vestibule closure is a critical aspect of airway protection during swallowing. We will demonstrate the parameters that differentiate safe from unsafe swallowing and provide confidence intervals for safe swallowing that can be used by clinicians to identify patients with heightened risk of penetration-aspiration.

**OP4.3 USE OF TRAINING TO IMPROVE THE RELIABILITY IN RATING VIDEOFLUOROSCOPIC SWALLOWING STUDIES (VFSS) USING TWO ANALYSIS PROTOCOLS**

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Introduction: Videofluoroscopic Swallowing Study (VFSS) has been commonly used in clinics and research as an instrumental assessment of swallowing functions. However, the reliabilities of VFSS analysis have been questioned in some studies. Training has been proposed to be one possible method to improve the reliability [1, 2]. A recently developed Coordinate Mapping protocol for analyzing VFSS has also been suggested to improve raters’ reliabilities [2]. The protocol makes use of imaging software to mark and track the movement of key landmarks during VFSS. The current study aimed to compare the effect of training on improving inexperienced clinicians’ reliabilities in using subjective clinical evaluation and the Coordinate Mapping protocols for VFSS analysis. Material & Methods: Forty undergraduate Speech-Language-Pathology students were randomly assigned to two training groups: a Clinical Evaluation (CE) and a Coordinate Mapping (CM) group. The CE group rated VFSS based on their subjective judgment and the CM group rated with the Coordinate Mapping protocol. All participants in a pre-training, training, and 1-day post-training rating sessions. Results: Results showed that both groups significantly improved after training when compared with their pre-training intra- and inter-rater reliabilities. In addition, the CE group had significantly higher intra- and inter-rater reliabilities in rating pharyngeal shortening than the CM group after training. Conclusions: Training is an effective method to improve the reliability in VFSS analysis. It is recommended that training protocols could be developed for each VFSS analysis protocol. In addition, the current study supports the use of the Coordinate Mapping protocol to analyze VFSS reliably but more extensive training on the use of the protocol may be needed.

**OP4.4 COMPARING PATIENT AND PROXY AGREEMENT CONCERNING IMPACT OF DYSPHAGIA ON PATIENTS’ QUALITY OF LIFE (QOL) AS MEASURED BY THE DUTCH VERSION OF THE SWALLOWING QUALITY-OF-LIFE (DSWAL-QOL) QUESTIONNAIRE**

I.S. Simpelvaere; J. Vanderwegen; G. Van Nuffelen; M. De Bodt1 / 1VIVES University College Bruges, Belgium; 2Department of Otologyngology, Head and Neck Surgery, Saint-Pierre University Hospital, Brussels, Belgium; 3Department of Otolaryngology and Rehabilitation Centre for Communication Disorders, Antwerp Universit, Belgium

Introduction: In patients with difficult self-reporting due to insufficient cognitive/communication skills, proxies (healthcare providers or significant others) can provide information on perceived QoL. Reliability of this information should be established for each questionnaire. Our study evaluated agreement of proxies’ ratings of dysphagic patients using the standardized DSWAL-Qol (Vanderwegen et al., 2013). Material & Methods: 56 patients and their proxies were studied. Inclusion criteria: neurologic or mechanical dysphagia during at least 1 month and objectified by MASA/FESS. 25 patients suffered only dysphagia (Dys); the others had additional language impairment/cognitive problems (DysLC). Patients and proxies independently completed the DSWAL-Qol. Comparison of proxy and patient data was performed using Intraclass Correlation Coefficients (ICC) and Spearman rank correlation (rs) in SPSS20. Results: Total scores showed significant agreement only for Dys (ICC=.72, rs=.73), not for DysLC (ICC=.27, rs=.21). All subscales (except eating duration and sleep) confirmed similar agreement exclusively in the Dys group, with moderate to good correlation (Table 1).
Conclusions: Worrying discrepancies between DysLC-patients and their proxies indicate either DysLC difficulties to complete the standard DSWal-QoL or true lack of agreement between both parties. The latter can be due to underestimated communication problems when discussing subjective problems. This lack of agreement can compromise the healthcare provided to patients with problematic self-reporting. An adjusted DSWal-QoL could increase the reliability of patients’ ratings. References: Vanderwegen et al, Dysphagia 2013; 28:11-23

OP4.5 HOW MUCH RESIDUE IS TOO MUCH RESIDUE?
C.M. Steele; V. Chak; A. Dhindsa; R. Dainin; A. Nagy; M. Peledeau-Pigeon; M. Tapson; S. Torreiter; T. Wolkin; A. Waito / Toronto Rehabilitation Institute, Canada

Introduction
The Normalized Residue Ratio Scale (NRRS) is an anatomically normalized pixel-based measure of post-swallow pharyngeal residue, which allows for more precise measures of residue severity than previously used ordinal rating scales. In 2011, Mølterep reported that thin barium NRRS values > 0.09 in the valleculae doubled the risk of aspiration on the subsequent clearing swallow. In this study, we sought to confirm the NRRS thresholds for primary swallows that predict airway invasion on the subsequent secondary swallow. Material & Methods A prospective sample of 312 participants completed a standardized videofluoroscopy protocol involving 6 sips of 20%w/v thin liquid barium. Blinded rating identified 50 primary swallows followed by clearing swallows and 105 primary swallows followed by piecemeal swallows (involving additional material from the mouth). Vallecular and pyriform sinus residue were measured on the final frame of each primary swallow. Univariable ANOVAs were used to compare residue severity for primary swallows leading to safe (penetration aspiration scale <3) vs. unsafe secondary swallows. Results Secondary swallow clearings involving penetration-aspiration scores ≥ 3 were preceded by vallecular residue occupying >28% of the available space (NRRSv>0.082) or by pyriform sinus residue occupying >15.8% of the available space (NRRSp>0.067). Above these boundaries, the odds of an unsafe secondary swallow were 6.2 (vallecular) and 4.86 times (pyriform) greater than the odds seen with residue below these thresholds. Conclusions These data are consistent with prior reports showing that the NRRS can delineate thresholds above which secondary swallows involve a greater risk of penetration and aspiration. With thin liquids, NRRS values of 0.08 (valleculae) and 0.067 (pyriform) represent the upper limits for safe secondary swallows.

OP4.6 IMPACT OF SWALLOWING DIFFICULTIES ON QUALITY OF LIFE OF PATIENTS WITH MYOPATHY
W.V. Nascimento; D.R. Domenis; C.F. Sobreira; R.O. Dantas / Medical School of Ribeirao Preto - University of Sao Paulo, Brazil

Introduction: Myopathies may cause dysphagia and impair quality of life (QOL). Our aim in this investigation was to evaluate the impact of swallowing difficulties on the quality of life of patients with myopathy. Material and Methods: We studied 58 patients with the diagnosis of myopathy, made by clinical evaluation, histochemical analysis of a skeletal muscle biopsy and by mitochondrial DNA analysis, who had swallows evaluated by videofluoroscopic examination, with liquid, paste and solid bolus mixed with barium sulfate. After the examination they were separated in two groups: 29 patients with abnormalities to swallow a solid bolus (12 men, mean age 40.1±14.3 years; disease duration: 15.8±6.9 years) and 29 without abnormalities to swallow a solid bolus (nine men, mean age 41.0±10.0 years; disease duration: 17.3±11.1 years). All of them answered the swallowing quality of life questionnaire (SWAL-QOL), an instrument which specifically assesses quality of life related with swallowing. Patient results were compared with the results of normal volunteers published in three recent publications. Results: Patients with myopathy had swallowing disturbances in videofluoroscopic only with solid bolus. The QOL was below normal volunteers in both groups in the domains of general burden, eating duration, eating desire, symptom frequency, communication, fear of eating, mental health, sleep and fatigue (p<0.05), and only in patients with dysphagia in the domains of food selection and social functioning (p<0.02). The QOL was lower in patients with swallowing alterations than in patients without swallowing alterations in the domains of general burden and eating duration (p<0.03). Conclusion: Myopathies compromises patient’s quality of life independently of swallowing difficulties. However, dysphagia is associated with further impairment of the quality of life in the domains of general burden and eating duration.

OP4.7 EVALUATING THE EFFECTIVENESS OF A DYSPHAGIA TRAINING PROGRAMME IN A RESIDENTIAL CARE SETTING: APPLICABILITY OF KIRKPATRICK MODEL.
A. Mc Enter; M. Walsh; F. LaMorgia / Trinity College, Dublin, Ireland

Background: Speech and language therapists (SLTs) worldwide train care-staff to manage dysphagia in residential long term care facilities. There is limited research on methods of evaluating the effectiveness of this training. The Kirkpatrick Model 1 is a recognised training evaluation framework in non medical business environments. It comprises 4 levels: Reaction, Learning, Behaviour, Results. This study aims to examine its applicability for evaluating a dysphagia training programme delivered to nursing and care staff by SLTs in a residential long term care facility. Method: Using a prospective mixed method design, dysphagia training took place in a long term residential unit in Ireland from March -- April 2015. Nursing and care staff provided consent to participate in evaluation of training. Training was delivered by SLTs not involved in the training evaluation. Data collection involved observation of participants during mealtimes, obtaining participant feedback on training, completing knowledge questionnaires to evaluate theoretical learning and observation of changes in behaviour with regard to managing dysphagia. Training was analysed according to the 4 Kirkpatrick levels. Results: Findings suggest this model captures the different domains of knowledge and skill in dysphagia training programmes. The framework was integrated readily into training schedules and proved a useful, easy to use, informative outcome measure. Conclusions: Systematic evaluation of training programmes is important. The Kirkpatrick Model has significant potential for evaluating dysphagia training in medical and clinical contexts.

16:30 – 17:30
Auditorium – Room J
Session 08A Free papers, Head and Neck Cancer and Physical Rehabilitation

OP8A.1 TONGUE STRENGTHENING EXERCISES (TSE) DURING 8 WEEKS: DOES LEVEL OF RESISTANCE (LR) MATTER?
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Purpose: The evidence is growing that TSE can improve tongue strength (TS). However, little is known about the effect of the LR used. The aim of this randomized controlled trial is to investigate the differences in outcome using 3 distinct LRs in an elderly population. Method(s): 60 healthy elderly (mean age and range: 79, 70–90 yo; 23 men, 37 women) participated in this study. The treatment using IOPI consisted of 60 repetitions both anterior and posterior, 1×/day, 3×/week, during 8 weeks. Experimental group 1 (EG1, n=15) at 80% of their maximal TS, EG2 (n=16) at 60% and EG3 (n=16) at 60%. A control group (CG, n=13) performed lip strengthening exercises. Maximum Isometric Pressures anteriorly (MIPa) and posteriorly (MIPp) were measured at baseline, after 4 and 8 weeks of training and 4 weeks of detraining. The effect of gender, group, time and their interaction effects were investigated by Mixed Models Analysis and post-hoc analysis with Holm-Bonferroni correction. Result(s): There was no significant gender effect. Significant group (p<0.05), time (p<0.001) and time×group (p=0.002) effects were found for MIPa and MIPp. Post-hoc analysis showed significant improvement of MIPa and MIPp in all EGs (p<0.001) but no no significant differences between the EGs. Conclusions: TS improved significantly after 8 weeks of TSE in a healthy elderly population. No LR was found to produce superior outcomes. Learning Objective: To gain further insight in the effect of TSE-protocol features on the outcome.

OP8A.2 EVALUATION OF LONG TERM (10-YEARS+) DYSPHAGIA AND TRISMUS IN PATIENTS TREATED WITH CONCURRENT CHEMO-RADIO- THERAPY FOR ADVANCED HEAD AND NECK CANCER

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Introduction: Dysphagia, commonly the most severe functional impairment shortly after concurrent chemoradiotherapy (CRT) for advanced head and neck cancer (HNC), may also develop or progress years after treatment. Hence, long-term (10-years+) swallowing and mouth opening outcomes in HNC patients are of great importance to evaluate functional success following CRT treatment. Material & Methods:

Twenty-two disease-free survivors, participating in a multicenter randomized clinical trial for inoperable HNC (1999–2004), were evaluated to assess long-term morbidity. The prospective assessment protocol consisted of videofluoroscopy (VFS) for obtaining Penetration Aspiration Scale (PAS) and presence of residue scores, Functional Oral Intake Scale (FOIS) scores, maximum mouth opening measurements, and (SWAL-QOL and study-specific) questionnaires. Results: At a median follow-up of 11-years, 22 patients were evaluable for analysis. Ten patients (46%) were able to consume a normal oral diet without restrictions (FOIS score 7), whereas 12 patients (54%) had moderate to serious swallowing issues, of whom 3 (14%) were feeding tube dependent. VFS evaluation showed 15/22 patients (68%) with penetration and/or aspiration (PAS ≥3). Fifty-five percent of patients (12/22) had developed trismus (mouth opening ≤35 mm), which was significantly associated with aspiration (p = 0.011). Subjective swallowing function (SWAL-QOL score) was impaired across almost all QoL domains in the majority of patients. Patients treated with IMRT showed significantly less aspiration (p = 0.011), less trismus (p = 0.035), and less subjective swallowing problems than those treated with conventional radiotherapy. Conclusions: Functional swallowing and mouth opening problems are substantial in this patient cohort more than 10-years after organ-preservation CRT. Patients treated with IMRT had less impairment than those treated with conventional radiotherapy.

OP8A.3 ENDOLUMENAL FUNCTIONAL LUMEN IMAGING PROBE (EN- DOFLIP) PROVIDES A VALID AND SENSITIVE DIRECT MEASUREMENT OF THE UPPER OESOPHAGEAL SPHINCTER COMPLIANCE IN PATIENTS WITH RADIOTHERAPY-RELATED DYSPHAGIA

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Background: Chemo-radiotherapy in the treatment of Head and Neck Cancer (HNC) with/without laryngectomy commonly causes dysphagia. Upper oesophageal sphincter (UOS) strictureing is an important contributor. The accuracy of indirect indicators of impaired UOS compliance, including manometry and radiography remains unclear. A direct quantitative technique of UOS compliance is needed. Hypotheses: i) UOS compliance is reduced in dysphagic HNC patients; ii) EndoFLIP is valid and sensitive in quantitation of UOS compliance and its alteration by endoscopic dilatation. Methods: We prospectively studied 16 patients with dysphagia following radiotherapy for HNC and compared them with 16 asymptomatic healthy controls. EndoFLIP calculates 16 cross-sectional areas (CSA) across an 8-cm fluid-filled bag and its corresponding...
intra-bag pressure during distension. The EndoFLIP measurements of the UOS were performed under sedation before and after endoscopic dilatation. Results: 2 of 16 (12.5%) HNC patients vs. 14 of 16 (87.5%) controls reached the maximal distension volume of 50ml (p=0.005). At the distension volume of 40ml, the mean CSA was lower in the HNC group vs. controls (95mm² vs. 191mm², p=0.001). Distensibility (CSA/mmHg) at the same distension volume was lower in HNC group vs. controls (2.29mm²/mmHg vs. 7.05mm²/mmHg, p=0.003). Of the 15 patients who underwent endoscopic dilatation, 13 patients (86.7%) had increased CSA, with a mean increment of 35.6mm² (95%CI [11.7-59.58], p=0.007). Figure 1. Conclusions: 1) Radiotherapy-related dysphagia is associated with poor UOS compliance, which is partly reversible by endoscopic dilatation. 2) EndoFLIP is a minimally-invasive, valid and sensitive method of quantifying UOS compliance, which may help define treatment efficacy and safety targets.

**OP8A.4 INFLUENCE OF EXTERNAL SUBGLOTTIC AIR PRESSURE (ESAP) ON DYSPHAGIC TRACHEOSTOMIZED PATIENTS**

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Introduction: Evidence supports a potential relationship between the generation of subglottic air pressure and swallowing. The aim of the study was to determine whether external subglottic air pressure (ESAP) would improve the swallowing frequency in severe dysphagic brain damage patients. We hypothesized that certain amount of external subglottic air pressure provided in a timely manner will increase the swallowing frequency. Methods: Ten dysphagic tracheostomized intensive care unit patients were recruited in the study. Blue Line Ultra² Suction aid features an integral suction lumen to aid removal of secretions from above the cuff (subglottic area). The novel intervention: from the same lumen ESAP can be provided to the subglottic area. ESAP intervention was provided at 60-65 min, 90-95 min and 120-125 min at 3L/min. The entire session lasts for 2 hr 30 min with patient lying in reclined/supine left side position (ideal condition). The secretions (ml) in subglottic lumen was recorded through syringe at 0, 30 and 60 min as baseline (averaged) and at 90, 120 and 150 min (averaged) as post intervention recording and swallowing events were also noted objectively at as an outcome measures by an experienced occupational therapist. The residual volume and swallowing events were compared intra sessions. Data were analyzed with ANOVA/T-tests. Results: The mean (±SEM) residual volume (in ml) reduced from 3.22±0.59 to 0.83±0.35 (P<0.001) after the intervention. The mean (±SEM) swallowing frequency increased from 0.60±0.31 to 2.48±0.78 immediately after every ESAP intervention (P<0.001). Conclusion: The reduction in residual volume from suction aid and increase in swallowing frequency probably indicates the improvement in swallowing i.e. reducing the risk of aspiration. To investigate the effect of ESAP in future, a thorough randomized control trial is required by well-established functional measurement of swallowing device.

**OP8A.5 HYOID BONE DISPLACEMENT AS PARAMETER FOR SWALLOWING IMPAIRMENT IN PATIENTS TREATED FOR ADVANCED HEAD AND NECK CANCER**

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Introduction: Reduced hyoid bone displacement (HBD) is thought to contribute to aspiration and pharyngeal residues in head and neck cancer (HNC) patients with dysphagia. Aim of the study was to determine whether timing and movements of the hyoid bone during swallowing are correlated with swallowing impairment in HNC patients, and whether these parameters are affected by chemoradiotherapy (CRT). Material & Methods: A single-blind evaluation of prospectively collected videofluoroscopy (VFS) studies and questionnaires was performed at three different time points before and after CRT. Twenty-five HNC patients were evaluated. Patients had undergone clinical swallowing assessments at baseline, 10-weeks, and 1-year post-CRT. VFS analysis was done on different swallowing consistencies of varying amounts (3 and 5 cc thin liquid, 3 cc thick liquid, and solid). VFS studies were independently reviewed frame-by-frame by two clinical researchers to assess timing (onset and duration) and spatial measures of HBD, the Penetration and Aspiration Scale, and presence of vallecular/pyriform sinus residues. Functional Oral Intake Scale scores and patient-reported swallowing function (study-specific questions) were also evaluated. Results: Mean maximum anterior and superior HBD ranged from 9.4 mm (23% of C2-4 distance) to 12.6 mm (27%), and from 18.9 mm (41%) to 24.9 mm (54%), respectively, depending on bolus volume and consistency. Hyoid bone elevation start-maximum elevation time and maximum anterior/superior HBD did not differ significantly over time. Patients with delayed or reduced HBD did not have greater risk of penetration/aspiration or post-swallow pharyngeal residues. Patients’ perceived swallowing impairment occurred significant more in patients with reduced superior HBD. Conclusions: No correlation patterns between delayed or reduced anterior/superior HBD and aspiration were demonstrated, though, reduced superior HBD seemed associated with subjective swallowing impairment.

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**OP8B.1 THE PEDIATRIC EATING ASSESSMENT TOOL (PEDI-EAT-10)**

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Introduction: EAT-10 is a valid and reliable tool which is specific for swallowing disorders in adult population. But there is no instrument like EAT-10 to evaluate swallowing disorders in pediatric population. Therefore Pediatric version of EAT-10 was developed with the cooperation of Hacettepe University and California University. The aim of this study was to develop the Pediatric Eating Assessment Tool (PEDI-EAT-10) for observing and assessing the symptom-specific outcome instrument for pediatric dysphagia. Materials and methods: The parameters of PEDI-EAT-10 was created by adapting from EAT-10. The opinion of seven
In the study of mastication problems in consecutive stages of Duchenne muscular dystrophy (DMD), a severe, progressive, X-linked neuromuscular disorder, characterized by progressive loss of muscle strength, starting in the lower limbs. Oral muscles become early involved, influencing negatively the oral and pharyngeal phase of swallowing (1). We performed a cross-sectional study to (a) describe thickness and structure of the masticatory muscles. The data were compared with normal values and described as Z-scores. Results: Already in the EAS, subjects with DMD adjust chewable foods, what increasingly happens in the other stages. In addition high percentages of posterior cross-bites and posterior open bites were reported in the ENAS and LNAS. Anterior open bite was present in almost 50% in all stages. The mean masseter muscle EI was only normal in the EAS (Z-score <2) and increased to Z-scores >3 in the ENAS and LNAS indicating dystrophic degeneration. The EI values of the temporal muscle have a Z-score <2 in all stages. Conclusions: The clinical course of mastication problems in DMD starts in the early stages. The problems are caused by the involvement of the disease in the masseter muscle, in combination with anterior and posterior open bite (the loss of occlusal contacts). Attention for mastication problems in early stages of DMD is needed.

**OP8B.3 THE 6-MINUTE MASTICATION TEST.**

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Introduction: Fatigue is a hallmark symptom of neuromuscular disorders (NMD). Especially in mitochondrial diseases, intolerance of physical activity is mentioned (1). In our clinical setting, patients often report easily fatigued muscles during mastication. However, identification of the specific problem is difficult, because clinical observations only reveal qualitative normal mastication. The aims of this study were to develop an endurance task for mastication, to collect normal values in a healthy population and to make a first comparison with data of patients with a mitochondrial disease. Material and methods: The endurance test consists of 6 minutes of mastication on a chewing tube (figure 1) on the preferred site of the teeth. The mastication movements were videotaped and by counting jaw movements the amount of mastication cycles (MC) per minute were determined. A visual analogue scale to measure fatigue and pain was used directly after the test and after 5 minutes. Results: Percentage reduction in MC was normal in 4 patients (z scores > -2) and deviant in 4 patients (z scores < -2). Adult patient data is being collected actually and will be presented. Conclusions: The 6-minute mastication test can be used to measure endurance in mastication and can be helpful in the assessment and feeding rehabilitation of patients with NMD.

**OP8B.4 RELIABILITY AND USABILITY OF THE TRANSLATED EATING AND DRINKING ABILITY CLASSIFICATION SYSTEM (EDACS) IN CHILDREN WITH CEREBRAL PALSY**

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Introduction: Oromotor difficulties are common in individuals with Cerebral Palsy (CP) causing problems like growth limitation, malnutrition or other health problems influencing quality of life. A functional classification system for eating and drinking abilities has been developed in the UK, called the EDACS (Eating and Drinking Ability Classification System). The EDACS identifies key features of safety (choking and aspiration risk) and efficiency (time taken and loss of food) linked with limitations to

Mean MC for the whole group (7–12 years, N= 106; 18–29 years, N=50) per minute ranged from 84.7 (SD 21.7) to 87.7 (SD 21.4), with only differences between children and adults in minute 5 (p <0.03) and 6 (p <0.05). For the whole group no significant differences were found between the amount of MC in minute 1 and minute 6. Besides, VAS-scores revealed no severe fatigue or pain, both indicating the possibility of healthy participants to complete this test. Reduction of MC between minute 1 and 6 was present in 69 healthy participants with a mean of 12% (SD 8.8%). In 11 children with mitochondrial disorders 3 could not complete the test. Percentage reduction in MC was normal in 4 patients (z scores > -2) and deviant in 4 patients (z scores < -2). Adult patient data is being collected actually and will be presented. Conclusions: The 6-minute mastication test can be used to measure endurance in mastication and can be helpful in the assessment and feeding rehabilitation of patients with NMD.

Figure 1
oral feeding skills. EDACS comprises 5 levels with level I “eats and drinks safely and efficiently” and level V “unable to eat or drink safely”. The reliability has been studied in an English CP population and showed promising results (ICC 0.93)(1). The aim of our study was to translate EDACS into Dutch, and to perform an interrater reliability and usability study with familiar, and non familiar speech and language therapists (SLT’s) in Dutch children with CP. Material & Methods: The EDACS was translated by Emerencio’s method (2). Children were classified on the EDACS by pairs of SLT’s and parents. SLT1 knew the child well and SLT2 (not familiar with the child) just observed the child during mealtime(s). All therapists were specialized in working with children with CP. Correlation with other functional CP scales (like Gross Motor Function Classification System (GMFCS)) was determined. Preliminary results: SLT’s classified 149 children. The ICC between pairs of SLT’s was 0.84 (95% CI 0.79–0.88), and between SLT1 and parents ICC 0.80 (95% CI 0.71–0.87). There was a significant but moderate correlation between EDACS and GMFCS (Kendall’s tau resp.0.60). The usability study showed the EDACS was comprehensible for both parents and SLT’s. Conclusions: The results of this study show good ICC’s, so the Dutch EDACS is a reliable system for classifying eating and drinking performance by experienced, familiar and non familiar SLT’s in children with CP.

OP08.5 MAXIMAL ISOMETRIC PRESSURE (MIP) OF THE TONGUE IN TYPICALLY DEVELOPING BELGIAN CHILDREN: INFLUENCE OF TONGUE BULB POSITION, AGE, GENDER, ORDER AND VISUAL FEEDBACK

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Introduction: Assessing tongue strength (TS) matters when assessing/rehabilitating pediatric dysphagia. European data are needed since cross-cultural differences is adult TS were already described1. Our study evaluated the tolerance and reliability of TS testing in children and the effect of several parameters on anterior and posterior MIP (MIPA, MIPP). Methods: 198 children (3–11yo, equal gender distribution) were included in 9 age groups. Inclusion criteria were absence of speech dis- orders or dysphagia, normal oral motor/structure exam, and no referral for special educational services. The IOPi and standard tongue bulbs were utilized; MIP was defined as the highest of 3 verbally motivated trials. Weight and hand strength were recorded. SPSS21 was used for statistical analysis. Results: All children tolerated the tongue bulb and children ≥6yo were able to perform MIPp; only 2% could not perform the full procedure, all related to MIPp. The results for the 3 trials were comparable with greatest variability 6yo as assessed by Cronbach’s α and ICC. MIPA was significantly lower than MIPp, in both conditions of visual feedback (VFB). TS increased significantly with age, resulting in 2 major groups (3–6yo vs 7–11yo)(fig1). No differences were found for gender or order. Use of visual feedback when possible (≥7yo since number sense is required) did not result in higher MIPa/MIPp. Regression analysis shows that TS is most predicted by non-dominant hand strength followed by age. Conclusions: This largest dataset available resolves some methodological questions on TS in children. We are the first to describe adult-like1 anterior-posterior MIP differences. TS increases with age, especially in children ≥6yo and cross-cultural differences in MIPa are smaller than in adults (fig2). Gender equality in TS corroborates previous results3. Order was not significant like in adults1; VFB provides no advantage unlike in adults1. These normative data provide the basis for future research/interventions.
gene. H&E dye was used to study the histology of the samples, the immunohistochemical assay used a) neuron-specific enolase to detect neuron fibres or b) fluorescent probes to locate TRPV1 or TRPA1.

Results: TRPV1 is expressed in the three studied regions, with higher expression levels in CN V region (tongue) than in CN X region (epiglottis, p<0.05), and is localized on the epithelial cells and nociceptive fibres in all studied regions. TRPA1 is also expressed in all studied regions but is localized below the basal lamina. No immunoreactivity for TRPA1 was found in the human oropharynx with two different patterns: TRPV1 is found on epithelial cells and submucosal sensory nerves while TRPA1 is only found below the basal lamina. Our study further confirms that oropharyngeal TRPV1/A1 receptors are promising therapeutic targets to develop active treatments for OD patients.

OP10.2 EFFECTS OF 5HZ REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION (rTMS) ON SWALLOWING FUNCTIONS OF DYSPHAGIC INDIVIDUALS

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Introduction: Repetitive transcranial magnetic stimulation (rTMS) modulates brain activities using electromagnetic induction. Recent studies have shown that rTMS can improve limb motor functions and swallowing functions after stroke. The current study investigates the effects of 5Hz rTMS applied over the tongue area of the motor cortex on swallowing functions of individuals with chronic post-stroke dysphagia. Materials and Methods: 15 participants (mean age = 64.6 years old) with chronic post-stroke dysphagia were randomly assigned into experimental (N=11) and sham (N=4) group. The experimental group received 3000 pulses of 5Hz rTMS everyday for 10 days. The sham group was given sham stimulation using the same stimulation protocol. The stimulation target was the tongue area of the motor cortex. All participants were assessed one week before, two months after and six months after stimulation. The outcome measurements include videofluoroscopic swallow study (VFSS), swallowing-related quality-of-life questionnaire and tongue strength. Results: Greater reduction in pharyngeal residue across food consistencies (thin, honey-thick and paste) was observed in the experimental group than in the sham group at both post-stimulation follow up assessments. Improvement in swallowing-related quality-of-life after stimulation was shown in the experimental group but not in the sham group. Tongue strength remained relatively unchanged after stimulation in both groups. Conclusions: Preliminary results showed that 5Hz rTMS applied over the tongue area of the motor cortex potentially improves swallowing functions and swallowing-related quality-of-life of individuals with chronic post-stroke dysphagia. Acknowledgement: This project was funded by Early Career Scheme, University Grants Council, Hong Kong.

OP10.3 EFFECT OF SUBMENTAL SENSITIVE TRANSCUTANEOUS ELECTRICAL STIMULATION ON VIRTUAL LESION OF THE OROPHARYNGEAL CORTEX

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Introduction: Oropharyngeal dysphagia is frequent in stroke patients and alters their outcome. Since several years, we observe the development of facilitation techniques based on cortical reorganization, like peripheral electrical stimulation. Even if transcutaneous electrical stimulation is attractive because of its simplicity, mechanisms of action are poorly understood. It is actually suggested that it could modify pharyngeal cortical representation. Material & Methods: Ten healthy subjects participated in the study. Motor evoked potentials of the mylohyoid muscles and videofluoroscopic parameters were measured before and after SSTES performed after the creation of the virtual lesion, at the end of SSTES (T0), at 30 minutes (T30) and 60 minutes (T60). Results: Nine subjects completed the study. After 20 minutes of SSTES, there was an increase of motor evoked potential amplitude (p < 0.05). There was also an increase of swallow reaction time after receptive transcranial magnetic stimulation, which was reverse after electrical stimulation. Regarding the cortical mapping, there was an increase in the number of points with a cortical response in the dominant hemisphere (p<0.05), remained constant at 60 minutes (p < 0.05). Conclusion: SSTES was effective on cortical plasticity for the mylohyoid muscles and reversed oro-pharyngeal cortical inhibition in healthy subjects.

OP10.4 ENHANCING DYSPHAGIA REHABILITATION IN TRACHEOTOMIZED STROKE PATIENTS WITH ELECTRICAL PHARYNGEAL STIMULATION

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Introduction: Treatment of post-stroke dysphagia is notoriously difficult with different neurostimulation strategies having been employed with a variable degree of success during the last years. Recently, electrical pharyngeal stimulation (EPS) has been shown to improve swallowing function and in particular decrease airway aspiration in acute stroke. In the present pilot study we used EPS for the treatment of severely dysphagic tracheotomized stroke patients. Methods: 30 consecutive stroke patients successfully weaned from the respirator were included in this study. All patients had severe dysphagia rendering decannulation impossible. Patients were randomized (2:1) to receive either real EPS or sham stimulation on three consecutive days. Primary endpoint was...
ability to decannulate the patient, facilitated by improved swallowing function, which was assessed by a previously established Fiberoptic Endoscopic Evaluation of Swallowing (FEES)-based algorithm. Patients having received sham stimulation were offered EPS treatment during unblinded follow-up if required. Results: Both groups were well matched for age, stroke severity and lesion location. Decannulation after study intervention was possible in 75% of patients of the treatment group and in 20% of patients of the sham group (p<0.01). During follow-up 7 still dysphagic patients of the sham group received unblinded EPS, whereupon in 5 of them (71%) the tracheal cannula could be removed. No adverse events occurred. Conclusion: EPS can safely be carried out in tracheotomized stroke patients. EPS enhances remission of dysphagia as assessed with FEES thereby enabling decannulation in the majority of patients.

**OP10.5 TASK-CONCURRENT ANODAL TDCS MODULATES BILATERAL PLASTICITY OF THE HUMAN SUPRAHYOID MOTOR CORTEX**

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Transcranial direct current stimulation (tDCS) is an effective, non-invasive method to modulate cortical excitability in humans. In order to understand the underlying neurophysiological relationship between the bilateral, intact swallowing cortical motor systems, we examined effects of tDCS on both the stronger and weaker suprahyoid/submental projections concurrently with swallowing tasks. Healthy participants were divided into two treatment groups: tDCS over the stronger hemisphere, and tDCS over the weaker hemisphere. Anodal or sham tDCS was randomly administered on separate days at least a week apart. Results: Initial observation showed large variability in the responses to 5Hz and 1Hz rTMS. Specifically, 53% of individuals showed reverse or flat patterns whereas 15% bidirectional responses to the 5Hz paradigm. By contrast, 1Hz stimulation revealed excitatory or no response in 33% and bidirectional effects in 23% of individuals. The grand mean changes of the 5Hz and 1Hz paradigms did not display consistent predicted directional effects. Conclusions: These results are comparable with recent data from investigations on the variability in the responses following non-invasive brain stimulation interventions delivered over the hand motor cortex in healthy subjects. Further investigations on individual factors will delineate the underlying mechanisms for the variability in responsiveness and will increase our knowledge for the stratified application of these therapeutic paradigms on dysphagic patients.

**OP10.6 VARIABILITY IN CORTICAL EXCITABILITY FOLLOWING REPETITIVE TRANSCRANIAL MAGNETIC STIMULATION PARADIGMS OF THE INTACT PHARYNGEAL MOTOR CORTEX**

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Introduction: Cortical excitability studies following brain stimulation paradigms over the pharyngeal motor cortex have been previously published with clear parameter, specific directional effects and therapeutic potential. Repetitive transcranial magnetic stimulation (rTMS) is one such technique, where defined frequency parameters have been established, however the variation in responsiveness to low and high frequencies is unclear. We examined electromyographic responses of the pharyngeal muscles termed Pharyngeal Motor evoked potentials (PMEPs) with single pulse TMS, following both reported excitatory (5Hz) and inhibitory (1Hz) rTMS paradigms. Materials and methods: Healthy volunteers (n=41, 25.4±4.6 years old) were assessed for corticobulbar excitability after single-pulse TMS. Repeated measurements of PMEPs were recorded before and for up to one hour after the interventions of 5Hz and 1Hz rTMS. Both interventions were applied to all participants on two separate days at least a week apart. Results: Initial observation showed large variability in the responses to 5Hz and 1Hz rTMS. Specifically, 53% of individuals showed reverse or flat patterns whereas 15% bidirectional responses to the 5Hz paradigm. By contrast, 1Hz stimulation revealed excitatory or no response in 33% and bidirectional effects in 23% of individuals. The grand mean changes of the 5Hz and 1Hz paradigms did not display consistent predicted directional effects. Conclusions: These results are comparable with recent data from investigations on the variability in the responses following non-invasive brain stimulation interventions delivered over the hand motor cortex in healthy subjects. Further investigations on individual factors will delineate the underlying mechanisms for the variability in responsiveness and will increase our knowledge for the stratified application of these therapeutic paradigms on dysphagic patients.

**OP10.7 NEUROPHYSIOLOGICAL EFFECTS OF TWO-WEEK TREATMENT WITH ORAL CAPSAICIN IN OLDER PATIENTS WITH OROPHARYNGEAL DYSPHAGIA**

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Introduction: Chronic treatment with sensory stimulation could induce cortical changes in patients with oropharyngeal dysphagia (OD) leading to improvement in swallowing function. Material and methods: Six older patients with OD (79.8±12.1 years, 3 men) were evaluated with videofluoroscopy (VFS) and electroencephalography to assess the pharyngeal evoked related potentials (ERP) before and after 10 days of treatment with oral capsaicin (10-5M), three times a day before meals. We assessed: a) changes in timing of VFS biomechanical events (laryngeal vestibule closure and upper esophageal sphincter opening time) and changes in the penetration-aspiration scale (PAS); b) changes in...
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OP12.1 THE EFFECT OF A DYSPHAGIA MANAGEMENT PROTOCOL ON PNEUMONIA RATES IN PATIENTS WITH ACUTE STROKE
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Introduction: Patients with acute stroke are at increased risk of developing aspiration pneumonia (AP). Cough reflex testing (CRT) may reduce AP by providing information about silent aspiration risk. However, in a recent trial that did not utilise a structured application protocol, CRT did not reduce AP (Miles et al, 2013), suggesting that a protocol may be as important as CRT itself. The use of stroke protocols is strongly advocated in the literature, yet only one study has evaluated this in dysphagia (Burek et al, 2008). We present preliminary findings from an evaluation of a Dysphagia in Stroke Protocol (DiSP) on reducing the rate of AP in a metropolitan hospital. Material & Methods: Pneumonia-related outcomes from 284 patients with acute stroke who were managed according to a DiSP were measured. The DiSP guides decision-making around resumption of oral intake based on CRT and videofluoroscopy findings. Outcomes were compared to a historical cohort of 119 patients who were managed with CRT in the absence of a defined protocol. Results: Preliminary analysis of 119 patient outcomes revealed a significant association between use of DiSP and development of AP, X2 (1) = 12.87, p < .001. The odds of developing AP were 3.42 times higher if no DiSP was used (95% CI 1.70 – 6.96). Conclusions: Preliminary results suggest that, when CRT is incorporated into a dysphagia management protocol, the rate of AP is significantly reduced in patients with acute stroke.

OP12.2 EFFECT OF A MINIMAL-MASSIVE INTERVENTION ON HOSPITALIZED OLDER PATIENTS WITH OROPHARYNGEAL DYSPHAGIA, PRELIMINARY RESULTS
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Introduction: Oropharyngeal Dysphagia (OD) is prevalent (47.4%) in hospitalized older patients. Material and methods: We designed a massive intervention (MMI) focused on these 3 main risk factors in acute hospitalized older patients with OD including 62 hospitalized patients admitted for an acute disease treated with the MMI and 124 controls with no active treatment matched by age, sex, functionality, comorbidities and Body Mass Index (BMI). The MMI consisted of: a) fluid viscosity adjustment with the Volume-Viscosity Swallowing Test; b) nutritional advice based on the Mini-Nutritional Assessment short form; and c) toothbrushing 3-day and chlorhexidine mouthwash 2-day. Oral hygiene was assessed by the simplified Oral Hygiene Index and oral health by number of teeth and caries. Main study variables were hospital readmissions, respiratory infections and survival. Results: Both groups presented similar age (84.5±6 vs. 84.4±5.3), poor functional status (Barthel 59.5±26.8 vs. 58.8±26.9), high comorbidities (Charlson 3.3±1.8 vs 3.1±1.5) and BMI (26.4±0.6 vs. 25.8±0.6 m2/Kg). The study showed at 6-month follow up that patients with MMI had fewer hospital readmissions (0.18 vs. 0.51 pp; P<0.03) and respiratory infections (0.04 vs. 0.36 pp; P<0.02), and increased survival (84.1 vs. 71%; P<0.04). Conclusions: The study suggests that MMI in hospitalized older patients with OD reduces readmissions and respiratory infections and improves survival. These patients should be managed by specialized professionals in the three areas: oral health, nutrition and swallowing function. Future prospective studies are needed to confirm its effect.

OP12.3 LARYNGOPHARYNGEAL SENSORY DEFICIT IN PATIENTS WITH MCA-INFARCTION: LATERALIZATION AND RELATION TO OVERALL DYSPHAGIA SEVERITY
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Introduction: Dysphagia is a frequent and dangerous complication of acute stroke. Apart from a well-timed oropharyngeal muscular contraction pattern sensory feedback is of utmost importance for unimpaired deglution. In the present study we therefore studied the association of laryngopharyngeal sensory deficit with dysphagia severity in acute stroke patients with infarction in the territory of the middle cerebral
OP12.4 VOLUNTARY COUGH AIRFLOW PREDICTS PENETRATION/ASPIRATION STATUS IN AMYOTROPHIC LATERAL SCLEROSIS.

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Introduction: Dysphagia and aspiration are prevalent in amyotrophic lateral sclerosis (ALS) and contribute to malnutrition, aspiration pneumonia and death. Early detection is critical to ensure maintenance of safe oral intake and optimal pulmonary function. The purpose of the current study was to determine the discriminant ability of voluntary cough airflow measures in predicting the presence of penetration/aspiration in individuals with ALS. Methods: 70 ALS patients (El-Escorial criteria) completed voluntary cough spirometry testing and underwent a standardized videofluoroscopic swallowing evaluation (VFSE). A rater blinded to aspiration status derived six objective measures of voluntary cough airflow and airway safety evaluated using the Penetration Aspiration Scale (PAS). A between groups ANOVA (safe vs. unsafe swallowers) was conducted and sensitivity, specificity, area under the curve (AUC) and likelihood ratios calculated. Results: VFSE analysis revealed 24 penetrator/aspirators (PAS >3) and 46 non-penetrator/aspirators (PAS <2). Cough volume acceleration (CVA), peak expiratory flow rise time (PEFRT), and peak expiratory flow rate (PEFR) were significantly different between airway safety groups (p <0.05). CVA, PEFRT and PEFR demonstrated significant discriminant ability to detect the presence of penetration/aspiration with AUC values of: 0.85, 0.81, and 0.78 respectively. Conclusions: Voluntary cough airflow measures identified ALS patients at risk for penetration/aspiration and may be a valuable screening tool with high clinical utility.

OP12.5 HIGHWAY TO DECANULATION: A BI-CENTER ANALYSIS OF DECANULATION RATES AND CAUSES OF WEANING FAILURE.

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Introduction: Tracheotomized patients with neurogenic dysphagia suffer from severely reduced quality of life, increased need of care, and face a higher risk of pneumonia and death. In consequence, weaning of tracheostomy tubes is a most important goal in dysphagia therapy. Our aim was to quantify decanulation rates in patients with chronic dysphagia and to analyze causes of decanulation failure. Method: A standardized clinical pathway for decanulation and saliva management was developed and implemented in two neurological hospitals in southern Germany in 2013. Standardized saliva management comprised 1) enhancing swallowing frequency, 2) using suction aid trach tubes, 3) anticholinergic medication and 4) Botulinum Toxin injections to the salivary glands. Analyses of decanulation rates and causes of weaning failure were calculated for the years 2013 and 2014 thus enabling us to describe the effect of controlling for standardized saliva management. Results: During the bi-annual observation period, 673 tracheotomized dysphagic patients were treated. 472 (70.1%) were decanulated in the course of their hospital stay. During the period from 2013 to 2014 weaning failure rates (11.1%) were significantly lower compared to 23.2% in 2013 following controlling for standardized saliva management. Conclusions: Efforts to optimize swallowing therapy and reduced saliva aspiration rates increased weaning success rates. Further strategies to improve the effect of controlling for standardized saliva management are required.

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OP12.4 VOLUNTARY COUGH AIRFLOW PREDICTS PENETRATION/ASPIRATION STATUS IN AMYOTROPHIC LATERAL SCLEROSIS.

E. Plowman1; R. Robison1; L. Tabor1; S. Watts2; J. Gazziano3 1University of Florida, United States; 2University of South Florida, United States

Introduction: Dysphagia and aspiration are prevalent in amyotrophic lateral sclerosis (ALS) and contribute to malnutrition, aspiration pneumonia and death. Early detection is critical to ensure maintenance of safe oral intake and optimal pulmonary function. The purpose of the current study was to determine the discriminant ability of voluntary cough airflow measures in predicting the presence of penetration/aspiration in individuals with ALS. Methods: 70 ALS patients (El-Escorial criteria) completed voluntary cough spirometry testing and underwent a standardized videofluoroscopic swallowing evaluation (VFSE). A rater blinded to aspiration status derived six objective measures of voluntary cough airflow and airway safety evaluated using the Penetration Aspiration Scale (PAS). A between groups ANOVA (safe vs. unsafe swallowers) was conducted and sensitivity, specificity, area under the curve (AUC) and likelihood ratios calculated. Results: VFSE analysis revealed 24 penetrator/aspirators (PAS >3) and 46 non-penetrator/aspirators (PAS <2). Cough volume acceleration (CVA), peak expiratory flow rise time (PEFRT), and peak expiratory flow rate (PEFR) were significantly different between airway safety groups (p <0.05). CVA, PEFRT and PEFR demonstrated significant discriminant ability to detect the presence of penetration/aspiration with AUC values of: 0.85, 0.81, and 0.78 respectively. Conclusions: Voluntary cough airflow measures identified ALS patients at risk for penetration/aspiration and may be a valuable screening tool with high clinical utility.

Table 1: Mean voluntary cough airflow measures for safe (PAS<2) vs. unsafe (PAS>2) swallowers. Three measures in the expiratory phase of the cough waveform were significantly different (p <0.05) across airway safety groups. Rate that peak expiratory flow rise time was converted to milliseconds.

<table>
<thead>
<tr>
<th>Measure</th>
<th>Safe Swallowers</th>
<th>Mean ± SEM</th>
<th>Baseline Swallowers</th>
<th>Mean ± SEM</th>
<th>P Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peak inspiratory flow rate (L/s)</td>
<td>-1.77 ± 0.62</td>
<td>-1.45 ± 0.60</td>
<td>0.10 ± 0.09</td>
<td>0.60 ± 0.60</td>
<td>0.70</td>
</tr>
<tr>
<td>Inspiratory phase duration (s)</td>
<td>1.67 ± 0.45</td>
<td>1.43 ± 0.45</td>
<td>0.15 ± 0.12</td>
<td>0.14</td>
<td></td>
</tr>
<tr>
<td>Expiration phase duration (s)</td>
<td>0.26 ± 0.34</td>
<td>0.33 ± 0.33</td>
<td>0.03 ± 0.03</td>
<td>0.29</td>
<td></td>
</tr>
<tr>
<td>Peak expiratory flow rise time (ms)</td>
<td>79.8 ± 57.1</td>
<td>159.2 ± 27.3</td>
<td>0.005</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peak expiratory flow rate (L/s)</td>
<td>3.11 ± 0.35</td>
<td>2.08 ± 0.35</td>
<td>-0.0003</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cough volume acceleration (L/s²)</td>
<td>106.79 ± 18.00</td>
<td>37.51 ± 7.00</td>
<td>0.0003</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*significant difference.

Table 2. Summary of receiver operating characteristic analyses between safe (PAS<2) and unsafe (PAS>2) swallowers in each outcome measure.

<table>
<thead>
<tr>
<th>Measure</th>
<th>AUC (95% CI)</th>
<th>Sensitivity (%)</th>
<th>Specificity (%)</th>
<th>PPV (95% CI)</th>
<th>NPV (95% CI)</th>
<th>LR</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cough Volume</td>
<td>0.65</td>
<td>4.05 ± 0.56</td>
<td>83.2 ± 4.56</td>
<td>31.0 ± 5.10</td>
<td>15.9 ± 3.25</td>
<td>1.25</td>
</tr>
<tr>
<td>Expiration Time (s)</td>
<td>0.56</td>
<td>4.06 ± 0.60</td>
<td>77.0 ± 4.56</td>
<td>22.0 ± 4.56</td>
<td>19.0 ± 3.5</td>
<td>1.27</td>
</tr>
<tr>
<td>Expiration Rate (s)</td>
<td>0.46</td>
<td>4.06 ± 0.60</td>
<td>77.0 ± 4.56</td>
<td>22.0 ± 4.56</td>
<td>19.0 ± 3.5</td>
<td>1.27</td>
</tr>
<tr>
<td>Expiration Flow (L/s)</td>
<td>0.38</td>
<td>4.06 ± 0.56</td>
<td>83.2 ± 4.56</td>
<td>31.0 ± 5.10</td>
<td>15.9 ± 3.25</td>
<td>1.25</td>
</tr>
</tbody>
</table>

CL Confidence Interval; LR Likelihood Ratio.
OP12.6 SWALLOWING TREATMENT USING ELECTRICAL PHARYNGEAL STIMULATION (STEPS) AFTER STROKE: A RANDOMISED CONTROLLED PHASE III TRIAL

P.M. Bath1; S. Scutt1; J. Love2; A. Yellowlees3; P. Clavé4; D. Cohen5; R. Dzwias6; H.K. Iversen7; H. Soda8; V. Woisard9; S. Hamdy10.

STEPS investigators11 University of Nottingham, United Kingdom; 2Phagenesis Ltd, United Kingdom; 3Quantics Consulting Ltd, United Kingdom; 4Universitat Autònoma de Barcelona, Spain; 5Northwick Park Hospital, United Kingdom; 6University Hospital Münster, Germany; 7University of Copenhagen, Denmark; 8Bad Neustadt, Germany; 9Université Toulouse, France; 10University of Manchester, United Kingdom; 11United Kingdom

Introduction Dysphagia is common after stroke and associated with a poor outcome. Treatment options for dysphagia are limited. Pharyngeal Electrical Stimulation (PES) is a novel treatment for post-stroke dysphagia that has shown promise in previous small trials. Material & Methods STEPS was an international multicentre phase III single-blind endpoint-masked randomised trial assessing the efficacy and safety of PES versus sham treatment in patients with recent stroke and dysphagia. Treatment was delivered via the Phagenyx® system on three consecutive days with PES given at 5 Hz and 75% of tolerated intensity for 10 minutes/day. The sham arm received assessment of threshold and tolerated intensities but no formal PES. The primary endpoint was penetration aspiration scale (PAS) at two weeks. Secondary endpoints included clinical measures of swallowing (dysphagia severity rating scale, DSRS), feeding status, dependency (modified Rankin Scale), pneumonia, dependency and adverse events at 12 weeks. Results The trial recruited 162 patients from 20 sites in five countries: Denmark 11%, France 4%, Germany 17%, Spain 6% and UK 62%. At baseline: mean age 74, male 58%, previous stroke 14.2%, onset to randomisation 13 days, ischaemic stroke 89%, stroke severity (NIHSS) 9.9, tube feeding 58%, PAS 4.8, DSRS 7.6. Discussion STEPS is the first large scale international randomised controlled trial for the treatment of dysphagia. The results will be presented and ongoing studies using the Phagenyx® system discussed.

OP12.7 NUTRITIONAL STATUS OF OLDER PATIENTS WITH OROPHARYNGEAL DYSPHAGIA IN A CHRONIC VERSUS AN ACUTE CLINICAL SETTING

S. Carrión1; M. Roca2; A. Costa2; V. Arreola3; O. Ortega4; E. Palomera4; M. Serra-Prat5; P. Clavé6;1 Hospital Mataró, Spain; 2Department of Dietetics and Nutrition, Hospital de Mataró, (Barcelona), Spain; 3Gl Physiology Lab, Department of Surgery, Hospital de Mataró, (Barcelona), Spain and Centro de Invest, Spain; 4Research Unit, Consorci Sanitari del Maresme, Mataró, (Barcelona), Spain; 5Gl Physiology Lab, Department of Surgery, Hospital de Mataró, (Barcelona), Spain and Centro de Invest, Spain

Introduction: Oropharyngeal dysphagia (OD) is a prevalent risk factor for malnutrition (MN) in older patients and both conditions are related to poor outcome. The aim of our study was to explore the nutritional status of older patients with OD in a chronic vs an acute clinical setting. Material and methods: We studied a total of 133 people, 95 older (≥70 years) patients with OD associated with chronic neurological diseases or aging; 23 older patients with OD and acute neurological diseases or aging; 15 older persons without OD. Swallowing function was assessed by videofluoroscopy (VFS). Nutritional status was explored by the MNA®, anthropometric measurements, biochemistry and bioimpedence for body composition and hydration status. Results: 1) Of patients with OD without an acute condition, 51.1% presented an MNA® of less than 23.5 and a) reduced visceral and muscular protein compartments and fat compartment in women; b) muscular weakness c) intracellular water depletion, and d) reduced body weight and basal metabolism. Patients with OD and MN needed higher levels of nectar thickening for a safe swallow and had increased oropharyngeal residue. 2) Of patients with OD and acute pneumonia, 69.5% presented an MNA® of less than 23.5 and a) reduced visceral and muscular protein mass; b) a decrease in intracellular water in men; and c) reduced bolus propulsion velocity. Conclusion: Prevalence of MN among patients with OD associated or not with acute conditions was very high and impaired the efficacy of thickening agents. Without an acute condition, MN in OD fits the sarcopenic type further supporting the concept of sarcopenic dysphagia. In the acute setting there was inflammation and an additional reduction in visceral protein compartment. Specific products for both OD and MN in each specific clinical situation should be developed.

OP12.8 REVERSIBLE OROPHARYNGEAL DYSPHAGIA IN ELDERLY PATIENTS ADMITTED TO A HOSPITAL

S. Casas1; V. Cabrejo2; S. de la Fuente3; V. Isern4; E. Pérez5; M. Layà6; C. Sabagh7; M.M. Lluch8; L. Ferrer9;1 Hospital Dos de Maig, Consorci Sanitari Integral, Spain; 2Hospital Dos de Maig Hospital, Consorci Sanitari Integral, Spain

Introduction Oropharyngeal dysphagia is often diagnosed in geriatric population during hospitalization. Patient’s functional status is often worsening because of an acute disease, and may favour dysphagia emergence. The aim of this study is to demonstrate reversibility of dysphagia in elderly patients after being recovered from an acute disease. Material & Methods Retrospective review of elderly patients ≥75 years diagnosed with oropharyngeal dysphagia during hospitalization, and re-examined in outpatients’ clinic by nutritionist after 2-8 weeks after discharge. Clinical assessment of dysphagia with the Volumen-Viscosity Swallow Test (V-VST) was performed. Improvement in dysphagia was considered when patient tolerated boluses of a greater volumes or a less viscous liquid. Results Fifty-one patients were included, 53% women with a mean age of 86.4 years (SD 5.6), 23.5% institutionalized, mean Charlson Index 2.2 (SD 1.4) and a mean Barthel Index of 53.3 (SD 32). Respiratory infection was the main diagnosis of 92.2% of patients. After V-VST was performed impaired efficacy of swallow were present in 10.8%, impaired safety in 35.1% and both in 54.1%. After discharge, all 51 patients were re-examined using V-VST. In 19.6% of patients dysphagia had completely reverted and in 43.1% had improved their level of dysphagia. Conclusions Patients diagnosed with oropharyngeal dysphagia during a hospitalization, should be re-examined after being discharged. Many patients reverted or improved their degree of dysphagia after recovered from an acute disease.
Swallowing Assessment of Saliva

J. Mortensen; D. Jensen; A. Kjaersgaard; 1Department of Public Health, University of Copenhagen, Copenhagen, Denmark; 2Hammer Neurorehabilitation Centre and University Research Clinic, Hammel, Denmark

Introduction: Facial-Oral Tract Therapy (F.O.T.T.) (1) is an approach that provides both clinical assessment and treatment of oropharyngeal dysphagia. In the F.O.T.T. approach, a prerequisite for the initiation of oral intake is safe swallowing of saliva. A recent randomized controlled trial (2) showed that patients assessed for initiation of oral intake with an F.O.T.T. based clinical assessment, hereinafter referred to as the Swallowing Assessment of Saliva (SAS), were no more likely to develop aspiration pneumonia than patients who were assessed with an endoscopic evaluation. The objective of the study was to investigate the validity and reliability of the F.O.T.T.-SAS in detection of aspiration risk in adult patients with acquired brain injury at a subacute inpatient neurorehabilitation centre (3). Material & Methods: Concurrent validity was established with blinded F.O.T.T.-SAS and endoscopic evaluation of 43 patients within a 24-hour time interval. Inter-rater reliability was established with two blinded F.O.T.T.-SAS of 33 other patients within a one-hour time interval. Results: The F.O.T.T.-SAS had a sensitivity of 91%, 95% CI (59; 100), a specificity of 88%, 95% CI (71; 97) and a kappa coefficient of 0.87 ± 0.17 in detection of aspiration risk. Furthermore, analyses showed that experienced and inexperienced occupational therapists performed equally in detection of aspiration risk. Conclusion: The F.O.T.T.-SAS is a simple, sensitive and reliable assessment for detecting aspiration risk in patients with acquired brain injury.

PPA.1 A VALIDATION STUDY OF THE FACIAL-ORAL TRACT THERAPY SWALLOWING ASSESSMENT OF SALIVA

Facial-Oral Tract Therapy (F.O.T.T.) (1) is an approach that provides both clinical assessment and treatment of dysphagia. In the F.O.T.T. approach, a prerequisite for the initiation of oral intake is safe swallowing of saliva. A recent randomized controlled trial (2) showed that patients assessed for initiation of oral intake with an F.O.T.T. based clinical assessment, hereinafter referred to as the Swallowing Assessment of Saliva (SAS), were no more likely to develop aspiration pneumonia than patients who were assessed with an endoscopic evaluation. The objective of the study was to investigate the validity and reliability of the F.O.T.T.-SAS in detection of aspiration risk in adult patients with acquired brain injury at a subacute inpatient neurorehabilitation centre (3). Material & Methods: Concurrent validity was established with blinded F.O.T.T.-SAS and endoscopic evaluation of 43 patients within a 24-hour time interval. Inter-rater reliability was established with two blinded F.O.T.T.-SAS of 33 other patients within a one-hour time interval. Results: The F.O.T.T.-SAS had a sensitivity of 91%, 95% CI (59; 100), a specificity of 88%, 95% CI (71; 97) and a kappa coefficient of 0.87 ± 0.17 in detection of aspiration risk. Furthermore, analyses showed that experienced and inexperienced occupational therapists performed equally in detection of aspiration risk. Conclusion: The F.O.T.T.-SAS is a simple, sensitive and reliable assessment for detecting aspiration risk in patients with acquired brain injury.

PPA.2 DISCRIMINATE ABILITY OF THE EATING ASSESSMENT TOOL FOR PREDICTING ASPIRATION IN INDIVIDUALS WITH AMYOTROPHIC LATERAL SCLEROSIS.

E. Plowman; T. Lavor; R. Robison; S. Watts; J. Gazzano; 1University of Florida, United States; 2University of South Florida, United States

Background: Oropharyngeal dysphagia is prevalent in individuals with amyotrophic lateral sclerosis (ALS), leading to malnutrition, aspiration pneumonia and death. These factors necessitate early detection of at risk patients to ensure maintenance of safe oral intake and pulmonary function. The aim of this study was to determine the discriminant ability of the Eating Assessment Tool-10 (EAT-10) to predict airway safety status (aspiration) during swallowing in ALS. Methods: 75 individuals with ALS (El-Escolar criteria) completed the EAT-10 survey and underwent a standardized videofluoroscopic evaluation of swallowing (VFES). Two blinded raters determined airway safety using the Penetration Aspiration Scale (PAS). ALS patients were divided into safe (PAS=1-2), penetrators (PAS=3-5) and aspirators (PAS=6-8). A between groups ANOVA was performed for and discriminant ability of the EAT-10 to detect aspiration using receiver operator characteristic analysis. Results: A significant main effect was observed for EAT-10 scores across airway safety groups [F(2)=27.60, p<0.001]. Mean EAT-10 scores for safe, penetrators and aspirators were: 4.2 (0.78) vs. 5.90 (1.96) vs. 20.50 (3.19) respectively. Post hoc analysis revealed that EAT-10 scores were higher (worse) in aspirators vs. safe swallowers and aspirators vs. penetrators (p<0.001). The EAT-10 demonstrated good discriminant ability to identify aspirators (AUC=0.88). An EAT-10 cut point of 8 had a sensitivity of 85.7%, specificity of 71.9%, negative predictive value of 95.5% and positive predictive value of 42.9%. An ALS patient was 3.05 times more likely to aspirate if they scored ≥8 on the EAT-10. Conclusions: ALS patient self-reports of swallowing impairment using the EAT-10 was able to differentiate safe vs. unsafe swallowers. The EAT-10 screen could represent a quick and meaningful aide to dysphagia screening in busy ALS clinics for identification and referral of dysphagic individuals.

PPA.3 APPLICATION OF THE RASCH MEASUREMENT MODEL ON THE DUTCH VERSION OF THE SWALLOWING QUALITY-OF-LIFE QUESTIONNAIRE (DSWAL-QOL).

I.S. Simpeaere; T. Hansen; J. Vanderwegen; G. Van Nuffelen; M. De Bodt; VIVES University College, AZ Delta Menen, University of Antwerp, Belgium; Metropolitan University College, Denmark; Department of Otolaryngology, Head and Neck Surgery, Saint-Pierre University Hospital, Brussels, Belgium; Department of Otolaryngology and Rehabilitation Centre for Communication Disorders, Antwerp Universi, Belgium

Introduction: The dysphagia-specific SWAL-QoL1,2,3 was previously translated and cross-culturally adapted into Dutch and validated using classical test theory. Since the scores of the 11 subscales and the total scale are summed, unidimensionality of the scales is required. This necessitates the application of modern item response theory (IRT). Therefore, this study aimed to investigate if the 11 subscales fitted the mathematical Rasch measurement IRT model.Material & Methods: Data from a validation study on the DSWAL-Qol comprising 108 patients was used to perform an extensive Rasch analysis using RUMM20305. Several measurement characteristics of the Rasch model, such as fit statistics by means of Chi-square, internal consistency reliability by means of the Person Separation Index (PSI) and the threshold ordering of the polytomous items were evaluated. During the Rasch analysis, which is an iterative process, adjustments to the response categories were proposed in order to improve the scale. Results: Nine subscales obtained satisfactory overall fit Rasch statistics (chi-square) with two subscales failing to fit the model. Further analyses revealed disordered thresholds of the 5-point scoring scales in the majority of the eight fitting scales and the two non-fitting scales. The estimate of the internal consistency reliability, obtained by the PSI, was achieved for only two subscales (PSI=0.70). Guided by Rasch analyses, the response categories of items with disordered thresholds were collapsed from the 5-point to a 3-point scale resulting in all modified scales meeting the threshold expectations of fit to the Rasch model. Despite these modifications, the reliability remained unsatisfactory for most subscales. Conclusions: This is the first study that applies the modern Rasch analysis on the
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DSWAL-GoL. Disordered thresholds of the 5-point scales require caution when summarizing item scores into subscale and total scores before adjustments have been made.

PPA.4 TURKISH VERSION OF EATING ASSESSMENT TOOL (EAT-10): VALIDITY AND RELIABILITY IN TURKISH POPULATION

N. Demir; S. Serel; O. Inal; A.A. Karaduman/ Hacettepe University, Turkey

Introduction: Eating assessment tool (EAT-10) is a self-administered, symptom-specific outcome instrument for swallowing disorders. The purpose of this study was to carry out the Turkish version study of EAT-10 its cultural adaptation to Turkish population and investigate its reliability and validity to use the instrument during the swallowing evaluation in Turkish population. Material-methods: EAT-10 was translated into Turkish first, then it was translated into English again. A committee on the back-translated formed necessary adjustments after the consensus. The back-translation was presented to the creator of the scale and after getting the approval and a pilot study was performed on 30 patients for cultural adaptation. EAT-10 was prepared for use on patients after adapting the misunderstood terms into Turkish culture. 105 patients, 18-year-olds and above, suffering from neurological diseases with different etiologies were included for test-retest reliability and validity. FOIS scale was used for validity. Results: Cultural adaptation was successful in the Turkish version of EAT-10 and all the parameters from the original protocol were accepted. The mean age of the patients who participated in the study was 57±15.4 and 45.7% of the patients were female. Internal consistency of the instrument was found to be high with 0.90 Cronbach’s alpha value for test and 0.91 Cronbach’s alpha value for retest. Analyses for the test-retest results of EAT-10 proved a consistency of 85%–96.7%. There was a correlation between EAT-10 and FOIS (p=0.05). Conclusion: This study is important to have a dysphagia specific, clinical scale which can be applied in Turkish language. Turkish EAT-10 scale is also important because it is short, easily understandable and practicable for every discipline. Future analyses will be carried out with Turkish EAT-10 which has Turkish validation on different patient groups and ages and, pre and post-treatment results will be compared.

PPA.5 PORTUGUESE VERSION OF THE V-VST: CONTENT VALIDATION

A. Matos1; C. Bouça1; J. Batista2; M. Seara2; S. Mestre1; T. Dias1; 1Centro Hospitalar e Universitário de Coimbra, Portugal; 2Hospital Distrital de Aveiro, Portugal; 3Escola Superior de Saúde da Universidade de Aveiro, Portugal; 4Centro Hospitalar do Algarve - Hospital de Faro, Portugal; 5Unidade Local de Saúde de Castelo Branco – Hospital Amato Lusitano, Portugal

Introduction: Dysphagia is a post stroke common impairment and its consequences can be enormous. The need for its early identification using validated screening tools is well known. In Portugal, there are no available validated screening tools for dysphagia. This study intends to translate and validate the Volume Viscosity Swallowing Test (V-VST) to the European Portuguese language. Material&Methods: The Spanish version of V-VST was translated into Portuguese, individually, by 2 bilingual Speech and Language Therapists (SLT). A common version was agreed. Back translation was completed by 2 Spanish native speakers who also speak Portuguese. SLT with experience in dysphagia analyzed this version, and classified all its items in terms of relevance, clarity, ambiguity and conceptual adequacy (phase I). Some modifications were suggested. The new version was reanalyzed by the same group (phase II). The Portuguese final version of V-VST was defined. Data resulting from both phases were statistically analysed. Modified Bland-Altman plot method, the Intraclass Correlation Coefficient (ICC) and the Content Validity Index (CVI) were obtained. Results: The graphics obtained by the method of Bland-Altman plot in both phases, revealed a greater agreement among experts regarding clarity, ambiguity, relevance and conceptual adequacy of the items in phase II. Same has happened with ICC values, showing a moderate to good correlation in phase II to clarity, ambiguity and conceptual adequacy (ICC=0.529;0.547;0.512, respectively). No correlation was found for relevance in both phases. All IVC values improved in phase II, however some items still present values considered below recommended. Conclusions: V-VST Portuguese version presented good values of content validity. It seems to be a simple and easy screening tool to be used in acute stroke settings by different trained health professionals. Further studies are needed in order to analyze its psychometric characteristics.

PPA.6 ACCURACY OF THE VOLUME-VISCOSITY SWALLOW TEST AMONG HEALTHCARE PROFESSIONALS IN A STROKE REHABILITATION UNIT

A. Tortosa; A. Romeo; S. Nieto; R. Boza; M. Tejero; A. Guillén-Solá/ Parc de Salut Mar, Spain

Introduction: Oropharyngeal dysphagia (OD) is highly prevalent condition in patients after stroke and it is an underdiagnosed disorder that causes severe nutritional and respiratory complications. Volume-Viscosity-Swallow-Test (V-VST) shows high diagnostic accuracy in identifying clinical signs and symptoms of impaired efficacy and safety of swallow. The main purpose of the study was to assess inter-rater correlation of V-VST between two healthcare professionals working in a post-acute stroke rehabilitation unit versus the VFSS. Material&Methods: 22 post-acute stroke patients with swallowing difficulties or suspected dysphagia were studied. V-VST was performed at the same time by 2 healthcare professionals with different degrees of expertise; one-year Rehabilitation medical resident (A), and new Rehabilitation resident (with a 2 hours formation) (B). They scored their results separately, and they determined the functional oral intake scale (FOIS) and estimated a clinical Penetration aspiration scale (PAS). The day after, VFS was performed by a Physiatrist with 8-year expertise in swallowing disorders, blinded to clinical results. Results: 22 patients with a mean age of 66.6 years. 63.6% were ischemic and 27.3% were hemorrhagic stroke. The A researcher, detected 55.6% and 40% of the security and efficacy alteration respectively in the pharyngeal phase of swallowing, with the V-VST according to VFS. While researcher B, detected 65% and 57%. Kappa value was 0.60 in security and 0.78 in efficacy alterations. The estimated PAS alteration that A researcher detected was 75% of the altered PAS in VFS. B researcher detected 77.8%. The Kappa value between researchers was 0.762. Conclusions: We found a good inter-rater correlation and high accuracy between two short-expertise medical residents in VST application for screening swallowing disorders in stroke patients. VST is an easy and reproducible test to detect swallowing disorders in a risk population of stroke patients.

PPA.7 CITRIC COUGH TEST FOR SCREENING OF ASPIRATION IN SUBACUTE STROKE PATIENTS

A. Romeo; A. Guillén-Solá; M. Galindo; F. Escalada; E. Marco; N. Bofill/ Parc de Salut Mar, Spain

Introduction: The PPA.7 CITRIC COUGH TEST FOR SCREENING OF ASPIRATION IN SUBACUTE STROKE PATIENTS aims to evaluate the effectiveness of the Citric Cough Test (CCT) as a screening test for aspiration pneumonia in subacute stroke patients. The study was conducted in a stroke rehabilitation unit in a tertiary hospital in Spain. Materials and methods: The CCT was performed on 50 subacute stroke patients within 6 months of their stroke. The patients were assessed using the Modified Barium Swallow Test (MBST) as the gold standard. Results: The CCT had a sensitivity of 88% and a specificity of 87% for detecting aspiration pneumonia. The positive and negative predictive values were 92% and 85%, respectively. Conclusion: The CCT is a feasible and reliable screening test for aspiration pneumonia in subacute stroke patients, with high sensitivity and specificity.
Introduction: Dysphagia is present in 85% subacute stroke patients and it is associated with an increase in medical complications such as aspiration pneumonia. Weakness or absence of cough reflex is correlated with an increased risk of pneumonia. The aim of our study was to demonstrate if C2 threshold is better detecting aspirators patients, with CCT at a 1.0mol/L dose, than C5 threshold.

Material&methods: A prospective study of 49 consecutive stroke patients admitted to an inpatient intensive rehabilitation ward in university’s tertiary hospital. The citric acid cough test (CCT) and videofluoroscopy (VFS) were conducted in each patient with suspect of dysphagia using the Volume-Viscosity Swallow Test (VST). CCT consists of oral inhalation of 1.0(w/v)% mixture of saline and citric acid for 1 minute through an ultrasonic nebulizer (OMRON NE-U17). We reported the two or more (C2) and five or more coughs peaks (C5) triggered as recommended by ERS Task Force. Differing opinions exist among investigators as to which is the preferred primary and-point, C2 or C5. Absence of natural cough was considered a failed test. The VFS determined the grade of dysphagia using the Penetration Aspiration Scale (PAS). Results: 35 men and 14 women with a mean age of 67.89 years. 73.5% were isquemic stroke (20.4%TACI, 12.2%PACI, 10.2%LACI, 30.6%POCI). At C2 threshold, 4 patients presented failed test (75% with PAS≥3; and 25% with PAS<3) and 43 triggered 2 or more cough (62.8% with PAS≥3; and 37.2% with PAS<3). At C5 threshold, 12 patients presented failed test (66.7% with PAS≥3; and 33.3% with PAS<3) and 34 patients triggered 5 or more cough (64.7% with PAS≥3; and 35.3% with PAS<3). ROC curves were constructed without achieving significance differences between C2 and C5 threshold, neither for diagnosing aspiration. Conclusions: The CCT at 1.0mol/L evaluated at C2 or C5 is a useful standalone tool to detect aspiration in sub-acute stroke patients.

PPA.8 CITRIC COUGH TEST FOR SCREENING OF ASPIRATION IN SUBACUTE STROKE PATIENTS

R.L.V. Guedes; T. Spinelli; I.P. Netto; N.P.C. Montoni; P.M. Milanello; B.S. Fulachi; T.D. Vilas Bôas; E.G. Vieira; A.N. Gonçalves; L.D. Siqueira; E. Carrara–de Angelis / AC Camargo Cancer Center, Brazil

Introduction: The aspiration pneumonia is an infectious process in the lungs that results from food or gastric contents/oropharyngeal secretions aspiration, it’s related to the presence of morbidity and mortality and high hospital costs. Dysphagia can be a cause of aspiration, therefore an early identification of its symptoms in hospitalized individuals is recommended. The purpose of this study was to describe the designing and implementation of an aspiration-risk protocol at a Cancer Hospital. Material and Methods: The aspiration-risk protocol was based on scientific literature and clinical practice of the participating specialists. This study describes a step-by-step process of creation and implementation of the protocol. Results: The protocol was created by a multidisciplinary team composed of doctors of different specialties, nurses, physiotherapists, speech language pathologists and nutritionists who met every two weeks during three months to discuss: the patients that should be included, action plans for protocol adherence and strategies/dynamics to accelerate the oral-type food offer. All patients presenting risk of aspiration were identified by the ICU staff (nurses, doctors and physiotherapists) at the moment of admission and in accordance to the ICU inclusion criteria: decreased level of consciousness, neurological diseases, tachypnea, noninvasive mechanical ventilation, 24 hours (or over) of intubation, tracheostomy, gastric or enteral tube, gastrostomy, esophageal/stomach/pancreas/duodenum/brain/lung/head and neck tumors. Patients with Glasgow below 13 and endotracheal intubation were excluded. All patients underwent clinical swallowing evaluation at the bedside, and when indicated, were referred to objective evaluations and/ or other exams. Conclusions: The protocol was created based on clinical literature and practice of specialists as a tool to assist in identifying patients presenting aspiration risk.

PPA.9 PSYCHOMETRIC REVIEW OF NON–INSTRUMENTAL SWALLOWING AND FEEDING ASSESSMENTS IN PEDIATRICS

R. Speyer; R. Cordier; D. Heckathorn; D. Denman / James Cook University, Australia; Curtin University, Australia

Introduction: There is a high incidence of parental reporting of abnormal swallowing and feeding function and the negative impacts thereof on children. As such there is a need to comprehensively evaluate the quality of psychometric properties of non-instrumental assessments in the area of pediatric swallowing and feeding. Methods: A systematic review was performed by two independent abstract reviewers using PubMed and Embase, and searching publishers websites and relevant feeding and swallowing textbooks. The psychometric properties of the retrieved non-instrumental swallowing and feeding assessments were evaluated against the COSMIN taxonomy of measurement properties using preset psychometric criteria. Results: Twenty-two assessments were included in the final review. All assessments had either caregiver of clinician respondents. For 14 assessments no data on psychometric properties could be retrieved. The quality of the remaining 8 assessments varied greatly although the overall quality of the psychometric properties proved unsatisfactory. Conclusions: Only limited information is available on the validity and reliability of non-instrumental assessments in pediatric swallowing and feeding; further research is needed to evaluate the psychometric properties of these assessments in pediatrics.

15:30 – 16:00   Exhibition Hall

Session 07B  Poster viewing, Instrumental assessment 1

PPB.1 PHARYNGEAL HIGH-RESOLUTION MANOMETRY: RELIABILITY OF CLINICAL ANALYSIS OF SWALLOWING

K.M. Lamvik; M.L. Huckabee / University of Canterbury, Rose Centre for Stroke Recovery and Research, New Zealand

Introduction: High-resolution manometry (HRM) is increasingly common in research and clinical practice. Knigge et al.1 provide the only published clinical protocol for analysis of HRM spatiotemporal plots. These measurements evaluate pressure and temporal characteristics of five anatomical regions during swallowing. However, the reliability of this technique is unknown. The aim of the current study is to evaluate the reliability of clinical swallowing measurements made with the Knigge et al. analysis method. Material & Methods: Five clinical researchers underwent a 20-minute training session for analysing ManoScan 360TM HRM spatiotemporal plots based on the abovementioned protocol1. Raters independently analysed 3 individual swallows from 3 healthy participants and 3 patients, with one repeated swallow from each
Abstract Book

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Introduction: A substantial pressure drift on the ManoScan™ high-resolution manometry (HRM) system has been reported. However, fundamental questions regarding this drift remain insufficiently answered. The present study provides critical analyses of HRM drift in vitro and in vivo, and is the first to test compensation methods from the ManoView™ Analysis Program. Material & Methods: Eight 15-min and three 5-hour in vitro studies were performed in a 37°C water-bath (depth of 4.0 cm, equivalent to 2.94 mmHg). Eight 15-minute studies and nine 8-hour in vivo studies were performed in a 37°C water-bath (depth of 4.0 cm, equivalent to 2.94 mmHg). Eight 15-minute studies and nine 8-hour in vivo studies were performed with healthy participants. Two correction methods, thermal compensation (TC) and interpolated thermal compensation (IC), were applied with ManoView™ Analysis Program; median error was calculated from the difference of corrected pressure from the expected value (e.g., 2.94 mmHg in vitro). Results: Overall pressure drift resulted from a thermal effect, an initial pressure shock due to change in temperature at intubation, and a baseline drift, a linear drift (R2 > 0.86) over time of unknown origin. Drift was highly variable across sensors (p < .0001) and studies (p < .0001), as seen in Fig.1A. In contrast to previous reports, there was no correlation between pressure drift and average or maximum pressure exposure (r = -0.02; r = -0.05). Following correction, error was best corrected with IC (Fig. 1B).

Figure 1: (A) Boxplot example of variability in thermal effect for all sensors. (B) Pressure-time graph showing non-corrected data (green), TC (blue) and IC (red).

Conclusions: Pressure drift in the ManoScan™ system is highly variable across sensors and studies, refuting manufacturer report that pressure uniformity remains within 2 mmHg for 4-hours or less of recording. Only IC is able to correct the error associated with pressure drift but requires communication with the manufacturer to enable this option. This drift may have a substantial impact in clinical diagnostics and research of swallowing function.

Introduction: Disruption to swallowing function is commonly-reported after anterior cervical spine surgery. To date, the literature has largely focused on patient-reported outcomes and/or the presence of aspiration. Yet, physiological changes in swallowing remain poorly understood. We seek to describe changes in swallowing parameters (residue, maximal hyoid position and pharyngeal wall thickness) on videofluoroscopy (VF) taken pre- and post-surgery. Materials & Methods: Scc calibrated thin liquid swallows were extracted from standardized pre- and post-surgical VF of 17 patients (8 male, mean age 55 years). These swallows were retrospectively analyzed for post-swallow residue (using 4 point ordinal ratings of severity for the vallecula and piriform sinus), maximal anterior and superior hyoid position (using previously reported methods), and posterior pharyngeal wall thickness. Acceptable levels of inter- and intra-rater reliability were achieved for all parameters. Within-subject comparisons were conducted using paired Wilcoxon sign rank test (residue) and paired t-tests (hyoid and pharyngeal wall thickness). Two-tailed p-values of <0.05 were considered statistically significant.

Results: A statistically significant worsening of the following swallowing parameters was confirmed post-surgery: a) vallecular residue (Z = 2.449, p = 0.016), b) maximum superior hyoid position (t(16) = 2.357, p = 0.016) and c) pharyngeal wall thickness (t(16) = 5.031, p<0.001). No significant differences in piriform sinus residue or anterior hyoid position were observed. Conclusions: Significant worsening of swallowing parameters including vallecular residue, superior hyoid position and pharyngeal wall thickness was observed in this retrospective VF sample of thin liquid swallows. Future prospective studies should investigate aspiration risk associated with these changes in swallowing parameters.

PPB.4 THE INFLUENCE OF AGE CATEGORY, GENDER, LOCATION, EFFORT, VOLUME AND CONSISTENCY ON LINGUAL SWALLOWING PRESSURES (PS) IN HEALTHY BELGIAN ADULTS

J. Vanderwegen1; G. Van Nuffelen2; C. Guns2; R. Elen1 1Thomas More University College, Belgium; 2Antwerp University Hospital, Belgium

Introduction: The influence of several subject and bolus parameters on...
Ps is not fully understood. Also, no previous European research on Ps is available although cross-cultural differences in maximum tongue pressures (MIP) were described1. Methods 160 healthy adults (with equal gender distribution) were studied using the IOPI and the standard tongue bulbs; pressure is expressed as absolute numbers in kPa. Exclusion criteria were complaints of dysphagia or dysarthria, neurological disorders, major oral or head and neck surgery, any history of cancer presence of diabetes or food allergies. All persons passed the 90cc water swallow test. Distinct age categories (AC; 1.20–60yo; 2: 61–70yo; 3: 71–80yo; 4: 80+yo) were based on previous MIP research1. Anterior and posterior tongue strength were assessed; each bolus was swallowed both non-effortful (NES) and effortful (ES) without allowing visual feedback from the IOPI in order to avoid influence during NES1. Consistencies used were still cold water, natural unsweetened yoghurt and potato puree and the starting order was randomized. Bolus volumes were 5 and 10 ml, corresponding with tea- and tablespoons. Mixed effects with random intercept and pairwise comparisons with stepdown Bonferroni correction was performed using SAS. Results No differences in Ps were found for age, gender or volume after correction for multiple testing. Comparing location, a significant higher Ps was found during water swallows in AC1 (p=.0024). ES revealed higher Ps than NES regardless of AC, gender and consistency (p<.000), except for water swallows in AC4. Analysis of consistency demonstrated that during NES, Ps for water were lower than yoghurt (p<.008)except in AC3-4 and puree (p<.0001)(all AC)(Table1). Ps for yoghurt were lower than puree (p<.02) except AC4. During ES, Ps for all consistencies were of similar magnitude across locations, except in AC4 where Ps for liquid were lower than yoghurt and puree (p<.03).

Conclusions Several parameters did not reach significance in this largest study to date, unlike previous research (Table2). While ES showed no major differences across consistency and AC, a consistently high NES Ps for any consistency was needed in AC4 to effectively clear the bolus. This can correspond with a clear reduction in functional reserve in the elderly.

PPB.5A ACCURACY OF CERVICAL AUSCULTATION FOR DETECTING DYSPHAGIA
S. Nozue, Y. Ihara; Y. Takei; K. Takahashi / Division of Oral Rehabilitation Medicine, Department of Special Needs Dentistry, Showa University Sc, Japan

Introduction: Cervical auscultation (CA) is a non-invasive screening method for detecting dysphagia, and it has been used widely in the clinical setting. There have been some studies focused on diagnostic accuracy of CA, reporting the sensitivity 62–95 percent and specificity 50–92 percent. One possible reason for these variations might be due to the differences of target sounds acquired during CA. Some reports focused on expiratory sounds (ES) pre and post the swallowing, while other reports focused on swallowing sounds alone (SS). In this study, we investigated the specificity and sensitivity of CA using three types of audio samples; pre and post swallow expiratory sounds, swallowing sounds alone, and swallowing sounds with pre and post swallow expiratory sounds. Methods: Seventeen patients with no dysphagia and 30 patients with dysphagia who underwent videofluorographic swallowing study (VF) at our department participated in the study. The pharyngeal residue was cleared before the VF. Acoustic sounds used for the perceptual test were recorded simultaneously with the VF images. The swallowing material for VF was a 3cc yoghurt-like food. Diagnosis with VF images was carried out by three dentists using the penetration-aspiration scale. Perceptual judgement of dysphagia was conducted by nine dentists and one speech-language pathologist by listening to three types of audio samples; pre and post swallow ES, SSand swallowing sounds with pre and post swallow expiratory sounds (SS+ES). The perceptual judgements of dysphagia against these types of audio samples were compared. Results: The sensitivity and specificity of ES was 58.4% and 63.9%, 72.9% and 66.9% for SS, and 80.9% and 58.2% for SS+ES respectively. SS+ES showed the highest sensitivity and the lowest specificity. Conclusion: Our results suggested that it would be most useful to have information of both swallowing sound and expiratory sounds before and after swallowing when perceptually evaluating dysphagia.

PPB.6 THE USE OF GYROMETRY TO CORRECTLY INTERPRET ACCELEROMETRY IN DYSPHAGIA
M.P.J. Henderson1; D. Smithard2; S.W. Kelly1; G. Marcelli1 / 1University of Kent, United Kingdom; 2King’s College Hospital NHS Foundation Trust, United Kingdom

Introduction: Use of accelerometry for dysphagia assessment and treatment was first proposed in 1991 and has been developed in many studies since, but has yet to gain wide acceptance in a clinical setting. Recent studies[1,2] attempting to build systems using accelerometers which measure larynx movement fail to report how the inevitable rotation of the sensor during measurement is accounted for. Accelerometry has enormous potential to be the basis for a portable, low-cost, safe and non-invasive dysphagia assessment tool, if it can be properly understood. Materials and Methods: Sensors which combine an accelerometer and a gyrometer (which measures rotational velocity) were placed on a group of healthy subjects. Tri-axial accelerometer data was collected simultaneously with gyrometer data during swallowing. The data was examined for evidence of a rotational component. The gyrometer output is used to calculate the true Anterior-Posterior and Superior-Inferior...
axis acceleration of the larynx. Results: A significant sagittal rotation can be observed during swallowing. Gyrometer and accelerometer data show high correlation, which would not be the case if rotation had little influence on the accelerometer output. A significant correlation between the shape of the gyrometer signal and speed, height and hold duration of larynx elevation can also be observed. Conclusions: Our study shows that rotation of the sensor in response to larynx movement is a large contributing factor to the accelerometer signal. This has important implications for the interpretation of the accelerometer signal: a gyrometer is essential for the correct interpretation of accelerometry of the throat. With our approach, several characteristics of a patient’s swallow can be distinguished, such as speed of larynx elevation, height of elevation, duration and strength of hold at maximum elevation. Viewing these separately can provide the clinician with a far clearer understanding of an individual’s swallowing physiology.

PPB.7 COMPARISON OF VIDEOFLUOROSCOPY AND IMPEDANCE PLANIMETRY (ENDOFLIP®) FOR THE EVALUATION OF ESOPHAGEAL STENOSIS

M. Scharitzer1; J. Lenglinger2; W. Schima3; P. Pokieser4 / 1Department of Biomedical Imaging and Image-Guided Therapy, Medical University of Vienna, Austria; 2Dept. of Surgery, Medical University of Vienna, Austria; 3Dept. of Diagnostic and Interventional Radiology, KH Göttlicher Heiland, KH der Barmherzigen Schwes, Austria; 4Unified Patient Division, Dept. of Medical Education, Medical University of Vienna, Austria

Introduction: Videofluoroscopy including a tablet test is considered the method of choice for visualization of the upper gastrointestinal tract in patients with solid-food dysphagia. Impedance planimetry (EndoFLIP®) is a novel diagnostic technique assessing endoluminal diameter and cross-sectional areas with simultaneous pressure evaluations and assessment of a distensibility index. The aim of this retrospective study was to compare both methods for evaluation of esophageal stenosis at the esophagogastric junction in patients with dysphagia. Material and Methods: A search of files patient revealed 34 patients who underwent videofluoroscopy including a tablet test and impedance-planimetry between 02/2010 and 12/2013. Videofluoroscopic examinations were retrospectively reviewed regarding the esophageal transit of standardized tablet (diameter, 14mm). Also the reporting of symptoms during tablet passage, esophageal motility disorders and other functional or structural abnormalities were evaluated. These data were correlated with impedance planimetry findings (McNemar tests). Results: Impaction of the tablet occurred in 22/34 patients, in 3 patients a moderately delayed transit was seen, whereas 9 patients showed a unimpeded tablet passage. Statistical evaluation showed no correlation between tablet behaviour and planimetry-findings in all patients. If patients with tablet impaction above the esophageal stenosis due to functional disorders were not included in the analysis, both methods showed a significant correlation concerning tablet impaction and esophageal diameter measured by impedance planimetry (balloon inflation of 50ml at rest) between 14-19mm (p=0.027). Conclusion: Videofluoroscopy and impedance planimetry use distinct evaluation methods and measurement parameters, but significant correlation between tablet impaction and residual esophageal lumen between 14-19mm measured by impedance planimetry is observed.

PPB.8 BENIGN ESOPHAGEAL STENOSIS REVISITED: EVALUATION BY VIDEOFLUOROSCOPY

M. Scharitzer1; J. Lenglinger1; P. Pokieser1 / 1‘Dept. of Biomedical Imaging and Image-Guided Therapy, Medical University of Vienna, Austria; 2Dept. of Surgery, Medical University Vienna, Austria; 3Unified Patient Division, Dept. of Medical Education, Medical University of Vienna, Austria

Introduction: Videofluoroscopy including a tablet test and impedance-planimetry are the combined investigation of function and morphology as well. It is an ideal first test for evaluation of swallowing disorders and may allow diagnosis of benign stenoses with high reliability in patients with dysphagia.

PPB.9 CORRELATION BETWEEN TONGUE PRESSURE EVALUATED BY THE IOWA ORAL PERFORMANCE INSTRUMENT (IOPI) AND BY VIDEOFLUOROSCOPY IN OLDER PATIENTS WITH OROPHARYNGEAL DYSPHAGIA

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Introduction: Accurate measurements of tongue strength are necessary to evaluate the swallowing function of older patients. We looked for a correlation between tongue pressure measured with the IOPI and bolus propulsion force calculated using videofluoroscopy (VFS). We also...
examine whether low tongue pressure was associated with impaired safety and efficacy of swallow and nutrition and frailty. Material and methods: Twenty older patients with oropharyngeal dysphagia (79.7±4.2 years) were evaluated with IOPI and VFS. With IOPI we measured maximum anterior and posterior isometric pressures and anterior and posterior pressures during the swallow of 5 mL and 20 mL boluses of thin liquid, nectar and pudding. With VFS we calculated tongue propulsion forces (using Newton’s 2nd law of motion) during swallow of the same boluses. We also recorded VFS signs of impaired safety and efficacy of swallow and nutritional and frailty parameters by clinical methods. Results: IOPI tongue pressures weakly correlated with tongue propulsion strength (anterior pressure: rs=-0.1916, P=0.036; posterior pressure: rs=-0.2585, P=0.004). In VFS, bolus propulsion strength for 20 mL boluses (6.10±5.94 cN) was significantly greater than for 5 mL boluses (1.24±0.82 cN, P=0.001). Differences were not significant between viscosities. With IOPI, anterior pressures during 5 mL boluses significantly increased with viscosity (13.73±3.39 KPa thin liquid, 14.63±3.92 KPa nectar, 17.19±5.52 KPa pudding, P=0.042). Anterior pressure during deglutition of patients with pharyngeal residue (13.87±4.23 KPa) was significantly lower than in patients without residue (15.56±4.83 KPa, P=0.045). Patients with BMI 30-40 had significantly higher pressures during deglutition (17.10±4.79 KPa) than patients with BMI 18.5-25 (12.83±4.11KPa, P=0.001). Conclusion: Tongue pressure measurements and bolus propulsion forces do not correlate. Both parameters need evaluating to characterize tongue function in dysphagic patients.

PPB.10 THE ENDOSCOPIC EVALUATION OF THE ORAL PHASE OF SWALLOWING (ORAL–FEES, O–FEES): PRELIMINARY DATA ABOUT THE RELIABILITY BETWEEN ENDOSCOPIC AND RADILOGICAL PROCEDURE. D. Farneti1; B. Fattori2; L. Bastiani3; E. Genovese1 / 1Audiology - Phoniary Service, AUSL Romagna, Rimini, Italy; 2ENT Audiology Phoniary Unit - University of Pisa, Italy; 3Institute of Clinical Physiology, National Council of Research (CNR) Pisa, Italy; 4Audiology Service - University of Modena, Italy

Introduction Oral FEES (O-FEES) is a new endoscopic procedure, which is a variation of FEES, conceived to directly visualise the oral phase of swallowing (preparation and propulsion of the bolus). In the perspective of a clinical use of this new procedure it was compared with the radiological gold standard. Material and methods A sample of 8 male outpatients, underwent a simultaneous O–FEES and VFSS. The inter-rater reliability using 11 radiological landmarks, compared to O–FEES, was blindly determined between two raters. Inter-rater agreement between the two judges for the O–FEES and VFSS scores was assessed with the single score intra-class correlation coefficient (ICC). Results The inter-rater agreement concerning endoscopical and radiological evaluations between the two raters, showed strong values of intra-class correlation coefficient (ICC) (interval confidence 95%): 0.875 (0.373-0.979) and 0.921 (0.542-0.986) respectively. The O–FEES score results correlate with VFSS score (Spearman correlation coefficient 0.85, p(0.016)). Conclusions Compared with the radiological gold standard, O–FEES offers reliable information about oral preparation and oral propulsion of the bolus.

15:30 - 16:00 Exhibition Hall
Session 07C Poster viewing, Professional roles in dysphagia management

PPC.1 REFLECTIVE THINKING DURING LEARNING NEW TECHNIQUE PREMATURES ORAL FEEDING E. Winnicka1; J. Smogorzewska2; G. Szumski2 / 1The Children’s Memorial Health Institut, Poland; 2The Maria Grzegorzewska Academy of Special Education, Poland

Preterm newborns require special support to develop oral feeding function. Appropriate technique of feeding increases its efficacy and safety, as well as reduces the risk of feeding disorders. Although it is commonly believed that the premature feeding: do not require special skills, is similar to the healthy and term newborns feeding, do not require any mental predispositions, such as reflective thinking - none of above statements are true. Aim: Examining changes in nurses’ reflective thinking level during training concerning acquisition of new skills in oral feeding technique of premature. Method: Trainings for nurses (N = 31) were performed in 5 different Neonatal Intensive Care Units in Poland. The trainings were focused on developing such skills of feeding preterm newborns as: working with the body of the child, selecting accessories for feeding, a selection of oral control and dynamic stabilization and recognizing the signs of baby’s readiness for start and for end of feeding. Training was divided into 4 stages: a lecture about feeding disorders of preterm infants (1), an assessment of participants feeding skills before the beginning of practical work (2), workshops (3), the assessment of feeding skills after training (4). At the end of each stage the level of reflective thinking about feeding techniques was examined. Results were analyzed with ANOVA with repeated measures. Results: The analysis showed significant changes: F (3,90) = 15.056; p<.001; eta²=.336 in level of nurse’s reflective thinking. Comparison post-hoc with Sidak’s correction showed positive changes between the measurements (1) and (2) (p=.002) and (1) and (3) (p=.0001) and (1) and (4) (p=.0001) respectively. There were no statistically significant differences between the measurements (2) and (4), (2) and (3), (3) and (4). Conclusion: Mental predisposition to reflective thinking is involved during acquisition of new feeding skills and can change during the proper training.

PPC.2 LEARNING BY PLAYING: APPLICABILITY OF THE “DYSPHAGIA GAME” FOR THE TRANSFER OF BASIC KNOWLEDGE ABOUT DYSPHAGIA (PILOT STUDY) K. Bykova; U. Frank / University of Potsdam, Department of Linguistics, Swallowing Research Lab, Germany

Introduction: Specific learning games can support the acquisition of fundamental knowledge of a topic [1]. Our pilot study examined whether playing an English version of a board game (pic.1) can transfer the basic knowledge about dysphagia more effectively than reading a text with the same information over an equal amount of time. This study was the pilot trial for a research evaluating the forthcoming German version of the “Dysphagia Game” (DG). Methods: The pilot trial included 8 students of the University of Potsdam, Germany. The participants were non-native but proficient English users. Participants were assigned to 2
groups (fig.1). Group 1 (Players) played the DG for at least 30 minutes during 5 days. All 44 questions of the DG were answered twice within this period. Group 2 (Readers) read the text created from the answers of the DG in their own pace twice during 5 days. By asking 5 control questions from the pool of the DG in a paraphrased wording, the study evaluated gained knowledge about dysphagia in 2 baseline measurements directly before and after the learning period. The number of correct answers was converted to numerical scores (max. 32). Results: The Players improved their knowledge of dysphagia from 4 points (SD=2.12) to 14.74 points (SD=3.69) after the learning period. An individual increase in knowledge ranged from 100 to 300%. The Readers enriched their knowledge scores from 3 points (SD=1.73) to 7.5 points (SD=1.65). Individual growth was from 33 to 400%. Conclusions: 1. The Players learned the basic knowledge more effectively than the Readers working with the informative text about dysphagia. 2. Implementation of the DG is beneficial for the transfer of knowledge of dysphagia to non-professionals. 3. However, the Players required more time to reach their level of knowledge.

Disclosures: This study was supported by Focus Games Ltd. Focus Games Ltd.: www.focusgames.com Dysphagia Game: www.dysphagiagame.com

PPC.3 EXAMINING SPEECH AND LANGUAGE THERAPY SERVICES TO PEOPLE WITH LUNG CANCER: INTERNATIONAL PRACTICES AND KEY CHALLENGES

F. Henriques; M. Walshe; F. LaMorgia/ Trinity College Dublin, Ireland

Introduction While speech and language therapists’ (SLTs) role in Head & Neck cancer is acknowledged, the role with people with lung cancer seems to be under-recognized and in practice patients tend not to be referred until palliative stages of care. However, research suggests that SLTs play a significant role in the management of patients with a diagnosis of lung cancer (Brady et al, 2015). Additionally, other studies focusing on care of the lung cancer population emphasize the importance of maintaining individuals’ quality of life (QOL), acknowledging that swallowing is always affected (Roe et al, 2007). The aims of this study are (1) to examine services provided by SLTs internationally to people with lung cancer and related communication and swallowing problems, (2) to examine current patterns of SLT service delivery and (3) to explore whether SLT services vary internationally.

Material & Methods: An anonymous, non-experimental, cross-sectional survey was used. Participants were recruited using snowball sampling. SLTs from Europe, New Zealand, Australia and United States of America participated in data collection. Results were analysed using descriptive statistics and comments were analysed qualitatively. Results Data from 136 SLTs was obtained. Overall, SLTs agree that the people with dysphagia and lung cancer receive less attention than SLTs people with other cancers. Results reinforce the consensus in the literature that SLTs have a significant role in the management of communication and swallowing disorders associated with lung cancer. Furthermore, SLTs believe they have a positive impact on the QOL of these people. Respondents emphasised the need for specialists guidelines in this area. Conclusions Further research must confirm the efficacy of SLTs’ role in dysphagia and lung cancer. Meanwhile, acknowledgement of the importance of early referral and integration of this population into clinical professional guidelines should improve services to them.

PPC.4 THE ROLE AND CURRENT PRACTICE OF SPEECH AND LANGUAGE THERAPISTS IN THE NEONATAL INTENSIVE CARE UNIT IN SAUDI ARABIA; A NATIONAL SURVEY

O. Jazzar1; M. Walshe2/1King Faisal Specialist Hospital and Research Center, Riyadh, Saudi Arabia; 2 Trinity College Dublin, Dublin, Ireland

Introduction: In Saudi Arabia, speech and language therapist (SLTs’) involvement in the Neonatal Intensive Care Units (NICUs) has been very recent. Information regarding the current roles and responsibilities of SLTs in this context as well as patterns of clinical practice within NICUs in Saudi Arabia is lacking. There are no Saudi clinical practice guidelines for speech and language therapy services, let alone SLT services provided in the NICU. It is important that SLTs’ clinical practice is as consistent as possible to ensure that patients receive equal evidence based care. Knowledge of the current SLT role and current practice in the NICU in Saudi Arabia is needed to determine the extent to which current practice reflects best international practice. The aim of this study was to examine the role, clinical experience, and current practice of SLTs in NICUs in Saudi Arabia. Materials & methods: An online survey questionnaire was devised and disseminated via SurveyMonkey. Emails containing the survey link was sent to SLTs working in medical settings in Saudi Arabia. Results: Twenty SLTs responded to the survey. Results suggest that the extent of involvement of SLTs in the Saudi NICUs is variable. The findings confirm that speech and language therapy services in the NICUs in Saudi Arabia are not fully developed, unrecognized and under-resourced. The need for interdisciplinary team cooperation and effective communication were the two most important factors indicated by respondents to improve SLT clinical practice in neonatal care.

Conclusions: The response rate reflects the number of SLTs working in NICUs in Saudi Arabia. These findings have implications for training and workforce development of the profession in neonatal care as well as the development of country specific professional guidelines. The findings reveal the factors that influence SLTs’ clinical practice in the NICU and pinpoint deficiencies to be addressed and suggestions for further development.

PPC.5 MULTIDISCIPLINARY MANAGEMENT OF DYSPHAGIA - ROUTINE WORK OR CHALLENGE FOR THE TEAM?

A. Uriko; E. Lurje; K. Nagel; L. Kööts-Ausmees/ Tartu University Hospital, Estonia

Introduction For the complex management of patients with dysphagia, the Speech and Swallowing Disorder Rehabilitation Center (SSDR) was established in Estonia, Tartu, in June 2012. Treatment of dysphagia in our clinic is based on multidisciplinary approach. Team consists of phy-
PPC.6 MULTIDISCIPLINARY MANAGEMENT OF DYSPHAGIA – ROUTINE WORK OR CHALLENGE FOR THE TEAM?
O. S. Sella1; Y. M. Manor1/1 ‘University of Haifa, Department of Communication Sciences and Disorders; Loewenstein Rehabilitation, Israel; 2Movement Disorders Unit, Department of Neurology, Tel-Aviv Sourasky Medical Center; Ono Academic Coll, Israel

Introduction: Up to date knowledge can aid speech and language therapists (SLTs) in patient management. We assessed the accuracy of dysphagia management- related knowledge of SLTs in Israel before and after a 60 hours dysphagia course.

Material & Methods: Closed questionnaires were used to assess the change in knowledge following 10 days of dysphagia course focusing on anatomy, physiology and biomechanics of swallowing, swallowing impairments, bed-side and instrumental evaluation, and management approaches. The questionnaire included multiple-choice questions regarding diagnosis and intervention based on bed-side evaluation, videofluoroscopy swallowing study (VFSS) and fiberoptic endoscopic examination of swallowing (FEES). Four visual analog scales (VAS) were used to evaluate professional confidence in fulfilling tasks related to therapy, supervising students, lecturing and presenting a case study.

Results: Twenty five out of 35 SLTs (Age: 33.4± 9.3 years; years of experience: 8.2± 9.5) filled the questionnaires at pre- and post-testing. McNamer analysis revealed significant increase in correct answers in knowledge related to VFSS interpretation in 3/4 questions (p = 0.016, p <0.001, p = 0.002). Knowledge related to BSE interpretation and FEES analysis remained low with no significant change (BSE p = 0.15, p = 0.69; FEES p = 0.11). VAS were tested using paired t-tests, with a significant increases in confidence following the course (therapy p < 0.001, supervising students p = 0.004, lecturing p < 0.001, case study p < 0.001). Conclusions: Accurate professional knowledge of SLTs is of high importance in dysphagia management. Dysphagia courses can provide some of the knowledge required, however, applying the knowledge in case management and decision making, might require an additional educational medium such as live simulation and hands on experience with supervision. Lastly, high level of confidence does not necessarily indicate high level of knowledge.

PPC.7 THE SURVEY OF OCCUPATIONAL THERAPIST MANAGEMENT IN PATIENT WITH SWALLOWING DISORDER
S. Szeentaweesook1; P. Benjapornlert1; G. Kongngeon1; P. Wattanapan2/1 ‘Department of Rehabilitation Medicine, Faculty of Medicine, Khon Kaen University, Khon Kaen, Thailand; 2Institute of Medicine, School of Medicine, Suranaree University of Technology, Nakornratchasima, Thailand

Introduction: Due to limitation of speech pathologist in Thailand, occupational therapists (OT) take a role in swallowing rehabilitation. There is only few training hour for swallowing disorder in curriculum, therefore some therapists has insufficient knowledge and lack of confidence in swallowing rehabilitation. This study aimed to survey the present practice in swallowing rehabilitation among occupational therapists in Thailand. Materials and Methods: The researchers studied the OT management in dysphagia patients between 2013–2014. The occupational therapists were asked to complete the questionnaire which consisted of working places and experiences, service frequencies in swallowing training, screening test, training techniques, swallowing investigation and training limitation. Results: One hundred and nine OTs completed the questionnaire. The majority, 33%, were more than 10-year-experienced general OT. Forty percent reported experience in swallowing training 1–2 case/week. The common cause of dysphagia was stroke (99%), cerebral palsy (58%) and Parkinson (47%). Three Oz water test was the most widely used (26.6%). Oromotor stimulation (88.1%), double swallowing (67.5%) and oropharyngeal strengthening exercise (54.1%) were performed as swallowing training techniques, respectively. Lack of self-confidence in swallowing rehabilitation was the most limitation (28.4%). Working experience on swallowing was associated with screening test method (p<0.05), OT who had less than 3-year-experience used 3 Oz water only (41%), while self-modification together with 3 Oz water test were taken in those who had 7-year-experience. The double swallow, diet modification, Stretching neck muscle, Masako, alternated swallow, supraglottic swallow, Mendelsohn maneuver were used statistic significantly (p<0.05) in 2014 group. Lack of screening test and training equipment were the statistic significantly problem in 2013 group (p<0.05). Both groups (p<0.05) needed basic swallowing knowledge and management. Conclusion: OT has been inadequate of a fundamental swallowing knowledge, management and standard screening test. This is useful information in planning future conferences in swallowing rehabilitation course.

PPC.8 WHAT PHARMACIST KNOW ABOUT THICKENER AGENTS
M. Civitepe1; I. Mavis1,2; E. Cicek1,3; Y. Kiliç1,5/1 ‘Anadolu University, Health Sciences Faculty, Turkey; 2Turkey, Turkey

Introduction: Dysphagia is the medical term for swallowing problems. Thickened liquids are often used for the management of dysphagia. This way the bolus control and antero-posterior transfer becomes
more manageable for the most difficult consistency-liquids. Purpose: To provide pharmacists with the basic knowledge to counsel caregivers in use thickeners agents for dysphagia. Material & Method: To access what the basic information they know about thickeners agents, a survey was conducted. All pharmacists in Central Eskisehir City was chosen as a pilot region. Of 89 Pharmacy in the region 67 was able to complete the survey. No commercial names were used, but only the main ingredients (e.g., starch, gelmix, or xanthan base). Other questions were the number of pharmacological agents they sell in one year for the diagnosis of aspiration pneumonia or dysphagia (code J18.9, R13), specifics of thickeners agents (volume, viscosity, look- taste). Results: Last year pharmacists provided approximately 45,000 prescribed antibiotic for the diagnosis J18.9 with the active ingredient “ceftriaxone” and “moxifloxa- cin” (Rocephin®, Unacefin® and Avelox®). Unfortunately, it is not easy to determine what percentage is for the aspiration pneumonia compared to pneumonia. However, the saddening information was to see the lack of understanding the use of thickeners. %95 of the participants were not aware of the products and what they are used for. All of them indicated use of the thickening agent would prevent necessary hydration status of the body. Since assisting families and caregivers in thickeners use part of the education part, pharmacists should be able to provide information on proper preparation, handling, and storage of the product since they are the part of the management team. Therefore, an informative paper is prepared and delivered to all participants.

PPC.9 PHYSICIANS PERSPECTIVE ON DYSPHAGIA MANAGEMENT
M. Civille; Z. Birisik; S. Selvi; 1SLP CCC, Turkey; ‘Anadolu University, Health Sciences Faculty, Turkey
Introduction: Swallowing disorders (dysphagia) are commonly due to delayed/ill passage of food into the stomach through the oral cavity during the swallowing process, prevention is the food escaping through the nasal cavity, entering to windpipe, or leaking through the mouth. Dysphagia is a serious symptom. Actually the lack of knowledge about dysphagia is an arousing factor interfering with management. Many times physicians treated dysphagia with proton pump inhibitors for many months without prior endoscopy then the patient present with inoperable esophageal cancer. Thus, management includes a team effort with multiple professions. Pilot work of this study is presented in The 1st Turkish Dysphagia Society Meeting (2013, Ankara). It is the first awareness work from the physicians’ perspective. Purpose: To determine what physician know about dysphagia. Sample taken from seven regions of Turkey, both from Public and private hospital settings. Results: 201 physicians responded to our survey out of 520 mailed. Of those, 78 of them are ENT, 50 Other (oncologist), 30 Physiatrist, 27 Neurologist, and 16 of them are Internal Medicine doctors. The experience of their practice ranged from 45 years (1 person) to 27 years (3 person) and 5–8 years the rest. 72% of them are employed at Public Hospital and 28% at Private. Of those participants only 37% were participated any workshop or seminars related to dysphagia. Among those who needed their examination for swallowing management had the following diagnosis: stroke 64%, craniofacial anomalies 14%, degenerative, 12%, 10% developmental problems. 22% of the participants were aware of the bedside swallowing diagnostic procedures. Only 2 of them know about Speech Therapists. Endoscopic evaluation was the choice of diagnostics (45%). Detailed statistics of demographic and knowledge base data will be presented: Close work with Turkish Dysphagia Society to set up educational programs for related physicians to increase awareness.

PPC.10 IMPLEMENTING THE OROPHARYNGEAL DYSPHAGIA AND ASPIRATION UNIT (ODAU) AT THE UNIVERSTIARY HOSPITAL ST. JOAN (UHSJ) REUS (CATALONIA, SPAIN): INTERDISCIPLINARY INVOLVEMENT.
G. Rion; A. Bonada; G. Boqué; R. Catala; G. Defebrer; I. Megias; N. Ortiz; J. Benitol Hospital Universitari |St Joan de Reus, Spain
Introduction: Oropharyngeal dysphagia (OD) is a highly prevalent symptom that can cause nutrition and respiratory complications. Prevalence of dysphagia is about 30–60%, depending on the population studied. OD is associated with high dyscapcacy, longer hospital stays and high mortality. Those reasons took us to create an interdisciplinary work team to diagnose OD in an early and reliable way, focused on implementing efficient intervention strategies to prevent, even to avoid, complications at a secondary level hospital. Material and methods: ODAU activity began at January 2010, and was composed by an otolaryngologist, two speech pathologists, a neurologist and a nutritionist. It developed a monthly outpatient clinic, in which a complete swallowing assessment was carried out in patients referred from several hospital departments. An oro- facial exploration and a fiberoptic endoscopic evaluation of swallowing allowed us to achieve a therapeutic specific plan in every patient. On the other side, ODAU developed a comprehensive protocol that integrated screening, diagnosis and treatment of the inpatients. Results: From 2010 to 2014 ODAU visited 242 patients with an annual progressive increase. At the same time we carried out an integral and specific plan in 208 inpatients during the last 2 years. Concurrently, it was crucial to provide training to all involved professionals. The First OD Training Course took place in April 2013. Further specific sessions were directed to more directly involved nurses. In 2014, once the inpatients OD protocol was consolidated, we set up the ODA Committee, a monthly meeting where related professionals evaluate each case in an interdisciplinary way. Conclusions: An interdisciplinary assessment of OD patients has been successfully established at the UHSJ, either for outpatients or inpa- tients. Specific protocols including screening, diagnosis and treatment achieve an early management of OD.

15:30 - 16:00  Exhibition Hall
Session 07D  Poster viewing. Dysphagia in stroke and brain damage
PPD.1 RESUCITATION OF NORMAL SWALLOWING FUNCTION IN WALLENBERG SYNDROME BY RTMS AND SURGERY
E. Verin; A.M. Leroi; J.P. Marie/ Rouen University Hospital, France
We report the experience of repetitive transcranial magnetic stimulation (rTMS) followed by ENT surgery in two patients suffering of an oropharyngeal dysphagia due to a brainstem infarction, stable since 18 months. The two patients were completely aphagic because of an absence of swallowing initiation, a hemipharyngo-larynx paralysed and pharyngo oesophageal dysnergia. We proposed five times a weeks of five sessions of rTMS (1Hz frequency, 20 minutes, both hemisphere,
Swallowing disorders observed were consistent irrespective of the cause of acquired brain injury. Patients unable to return to oral feeding 3 months after admission, had at admission a tracheotomy with inflated cuff (p = 0.14), bronchial obstruction (p = 0.14), salivary stasis and aspirations objectively identified by nasal endoscopy (p = 0.14). Conclusion: Swallowing disorders are systematic in severe brain injury and early bedside assessment is essential to propose appropriate medical rehabilitation care.

PPD.3 PHONATORY MEASURES AND OROPHARYNGEAL DYSPHAGIA IN THE ELDERLY AFFECTED BY STROKE
C.T. Mituuti1; A.G. Brasolotto2; G. Berretin-Felix1/ 1Federal University of Santa Catarina, Brazil; 2Bauru Dental School - University of São Paulo, Brazil
Purpose: The purpose of this study was to verify if phonatory measures are associated with oropharyngeal swallowing in the elderly affected by stroke Material and Methods: We evaluated 19 individuals affected by stroke (average age 69 years). All individuals were submitted to a functional endoscopic evaluation of swallowing with solid, pudding and liquid; the posterior escape, stasis (salivary, pharyngeal, valleculae and pyriform sinus), laryngeal penetration and aspiration, number of swallows and laryngeal sensibility were also verified. Furthermore, the individuals were submitted to the spirometry to verify the phonatory volume, average of phonatory flux, simple phonic quotient and composed phonic quotient. Results: According to the Spearman test, a negative correlation was verified between the posterior escape for the solid and the phonatory volume (r = -0.522; p=0.046), and the average of phonatory flux (r = -0.555; p=0.032), demonstrating that the higher the posterior escape was, the lower the phonatory volume and the the average of phonatory flux in the individuals affected by stroke were. Furthermore, a negative correlation was verified between the valleculae stasis for the pudding consistency and the simple phonic quotient (r = -0.534; p=0.018), demonstrating that the higher the valleculae stasis, the lower the value of the simple phonic quotient. Conclusion: A correlation was identified between the aspects of oropharyngeal dysphagia and the phonatory volume, as well as with the simple phonic quotient, demonstrating the possibilities of common intervention in both functions.

PPD.4 LIMITED FUNCTIONAL RESERVE IS NOT A CHARACTERISTIC OF NEUROGENIC DYSPHAGIA
A.M. Namasivayam1; C.E.A. Barbon1; V. Chak2; M. Peladeau-Pigeon3; S.L. Stokely4; C.M. Steele2/ 1University of Toronto, Canada; 2Toronto Rehabilitation Institute - University Health Network, Canada; 3Trillium Health Partners, Canada
Introduction: Tongue-palate pressure is a parameter of great interest in the field of dysphagia. Maximum isometric tongue-palate pressures (MIPs) decline in healthy aging. Functional reserve (FR) is the difference between MIPs and swallowing pressures, and is also thought to decline in healthy aging. In this study, we explored whether MIPs and functional reserve are reduced in individuals with dysphagia, compared to healthy age-matched controls. Materials & Methods: We studied a retrospective clinical sample of 43 adults with dysphagia secondary to stroke, acquired brain injury, brain tumor, neurodegenerative disease or age-related frailty (26 male; mean age: 60, age range: 26–93). Peak anterior MIPs and regular effort saliva swallow (RESS) pressures were collected with the Iowa Oral Performance Instrument and FR was calculated. Paired t-tests were used to compare measures for these individuals with dysphagia to decade-based means from a sample of 340 healthy controls aged 12–86 (162 male). Results: The 95% confidence intervals for individuals with dysphagia were MIPs of 33-43 kPa (mean = 38) and FRSS pressures of 17-26 kPa (mean = 22). Both MIPs and RESS pressures were significantly lower than values seen for age-matched controls (p < 0.001). Confidence intervals for the healthy controls were MIPs of 43-47 kPa (mean = 45) and RESS of 29-30 kPa (mean = 30). Functional reserve averaged 15 kPa in both groups. Confidence intervals for FR were wider in the individuals with dysphagia (10–19 kPa) than in the controls (14–17 kPa), but this difference was not statistically significant. Conclusions: In contrast to older healthy controls, who only show a reduction in MIPs, individuals with dysphagia also demonstrate a significant reduction in

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swallowing pressures. The impact of this reduction is to preserve an average gap of 15 kPa between MIPs and swallowing pressures. Thus, limited FR is not a characteristic of neurogenic dysphagia.
PPD.8 DYSPHAGIA DETECTION AFTER IMPLEMENTATION OF A NEW PROTOCOL IN ACUTE STROKE PATIENT’S ATTENDED IN THE HOSPITAL DEL MAR
G. Romeral1; M. Villatoro2; E. Muñoz3; E. Giralt4; J. Roquer1/1 Neurology department. Hospital del Mar, Spain; 2Endocrinology department. Hospital del Mar, Spain

Introduction Previous studies have shown that dysphagia is frequent after an acute stroke, affecting between 27%-50% of patients. The objective of this study was to evaluate if the implementation of a new protocol (NP) for oropharyngeal dysphagia (OD) detection, modifies the prescription of diets, compared to a previous period. Methods In our centre, since 2009, OD diagnosis in acute stroke patients (ischemic strokes, hemorrhagic strokes, and subarachnoid haemorrhage) was performed with the water test. In October 2014 a NP was created, in collaboration between the Neurology, Endocrinology and Rehabilitation Departments, using as screening for OD the clinical examination method volume-viscosity(MECV-V) and afterwards the diet of patients were adapted according to the test results (see Figure 1). Subtypes of diets were classified as: normal, crushed diet, easy mastication diet, dysphagic type I diet and dysphagic type II. We conducted a retrospective study comparing no consecutive patients admitted in our Hospital pre and post implementation of the NP. Results: We analyzed 476 patients, 256 of these in the group 1 (previous to NP implementation), and 220 in the group 2 (after the NP implementation). No differences were found between groups according to age, gender, type of stroke, and initial stroke risk (moderate/severe or vertebrobasilar stroke), where the screening is performed by a trained nurse of Dysphagia Unit. She assesses patients with bedside evaluation and Volume-viscosity test. This same nurse establishes the need for further invasive tests for the assessment of dysphagia (FESST and/or VFSS). She also adapts the consistency of individual diets and even provides indications of dysphagia rehabilitation. Results: 420 patients with stroke (PnP: 78 patients, InP: 100 patients and CP: 242 patients) were included. The groups were comparable in clinicals AND epidemiology OD have some degree of 37.7% in the PnP, 36% on InP and 32% for CP. We found that AP prevalence was 32% in the PnP, 10% on InP (OR = 4.2; p = 0.0002) and 7% in the CPs (OR 6.6, p = 0.0001). Mortality rate was 16.6% in the PnP, 10% in the InP (p = 0.09) and 8.6 in CPs (p=0.001). Conclusions: In our hospital, the implementation of a protocol for the integrated management of dysphagia has reduced the mortality and aspiration pneumonia rate in patients of Stroke Unit.

PPD.9 IMPROVEMENT OF MORTALITY AND ASPIRATION PNEUMONIA RATE IN STROKE UNIT AFTER IMPLANTATION OF DYSPHAGIA ASSESSMENT PROTOCOL
R.G.F. Gutiérrez Fonseca; J.F.F. Fernandez Ferro; B.B.B. Garcia Botran; M.G.R. Guilain Rodriguez; J.G.N. Granell Navarro; J.P.M. Pardo Moreno; T.M.G. Millas Gomez; L.S. Sambrano; M.A.F. Abuin Flores/ Hospital Universitario Rey Juan Carlos, Spain

Introduction: The acute stroke (IA) is the most common cause of oropharyngeal dysphagia (OD) and aspiration pneumonia (AP). We want to compare the incidence of AP before and after the implementation of a protocol for the integrated management of OD in the stroke unit (SU) of the Hospital Universitario Rey Juan Carlos (HURJC) in Mostoles (Madrid).

Methods: We have established three study periods: preimplantation period (PnP: September 2013 – February 2014), before Dysphagia Unit Protocol in SU; initiation period (InP: March 2014 – June 2014) take off of protocol and consolidation period (CP: June 2014 – March 2015). We divide patients admitted to the SU in two groups. The first group are patients with low risk of OD (TIA or mild stroke) in which the screening is done through an adaptation of NOD step-wise protocol of Ickenstein, performed by SU nursing. The second group are patients with moderate or high OD risk (moderate/severe or vertebrobasilar stroke), where the screening is performed by a trained nurse of Dysphagia Unit. She asses patients with bedside evaluation and Volume-viscosity test. This same nurse establishes the need for further invasive tests for the assessment of dysphagia (FESST and/or VFSS). She also adapts the consistency of individual diets and even provides indications of dysphagia rehabilitation. Results: 420 patients with stroke (PnP: 78 patients, InP: 100 patients and CP: 242 patients) were included. The groups were comparable in clinicals AND epidemiology OD have some degree of 37.7% in the PnP, 36% on InP and 32% for CP. We found that AP prevalence was 32% in the PnP, 10% on InP (OR = 4.2; p = 0.0002) and 7% in the CPs (OR 6.6, p = 0.0001). Mortality rate was 16.6% in the PnP, 10% in the InP (p = 0.09) and 8.6 in CPs (p=0.001). Conclusions: In our hospital, the implementation of a protocol for the integrated management of dysphagia has reduced the mortality and aspiration pneumonia rate in patients of Stroke Unit.

PPD.10 IMPACT OF NEUROLOGICAL DEFICITS, DEPRESSION, NUTRITIONAL STATUS AND SWALLOWING DIFFICULTIES IN QUALITY OF LIFE AFTER STROKE
A.C. Pacheco; R.S. Santos; A.M.Q. Norberto; W.V. Nascimento; R.P.C. Miranda; M.R. Montaldi; D.B. Favoretto; F.J. Dal Bem; L.B.M. Alves; B.P. Rimoli; M.C. Braga; T.C. Bueno; T.E.G. Santos–Pontelli; P.T. Cougo-Pinto; K.T. Weber; S.C. Mazin; R.O. Dantas; O.M. Pontes–Neto/ School of Medicine, Ribeirao Preto, Brazil

Introduction: Dysphagia is common in stroke patients and can contribute to morbidity and mortality due to nutritional and pulmonary complications. In addition to the complications, dysphagia may be related to poorer quality of life. Our aim was to evaluate quality of life related to swallowing in stroke patients after three months of stroke, and to assess if impaired quality of life in this population was associated with neurological deficits, depression, nutritional state and swallowing difficulties. Material & Methods: 87 stroke patients were evaluated, 44 female patients (51%), age mean (SD) was 63.82 (13.19) years, 86% had ischemic type of stroke. To evaluate stroke severity was used National Institute of Health Stroke Scale (NIHSS) at hospital admission, 24 hours after admission, discharge and 3 months after stroke. To measure functional disability was used Barthel Index. It was also applied Patient Health Questionnaire (PHQ-9) for assessing presence of depression.
Individual semistructured interviews the primary method. Four interviews
using a hermeneutic-phenomenological approach to qualitative enquiry was used with indi-
family carers of people with MND (PwMND). Methods: A hermeneutic-
needs. This study offers an exploration of the dysphagia experience for
aspects of MND, such as dysphagia, is lacking. An in-depth understand-
experience is available however research aimed at understanding
which impacts the family unit. Research investigating family carer
experiences of dysphagia may shape healthcare professional’s thinking
in relation to how they interact with family carers when managing feed-
ing, eating, drinking and swallowing difficulties. Additional evidence is
required to inform practice.

15:30 - 16:00   Exhibition Hall
Session 07E   Poster viewing. Dysphagia in neurodegenerative
and geriatric patients

PPE.1 “WE WERE LEFT TO OUR OWN DEVICES AND WE DIDN’T
THICKEN EVERYTHING.” THE COMPLEX NATURE OF THE HEALTHCARE
PROFESSIONAL – FAMILY CARER RELATIONSHIP, AND ITS EFFECT ON
THE EXPERIENCE OF DYSPHAGIA IN MND
S.L. Daly; C. Jagoe/ Department of Clinical Speech and Language
Studies, Trinity College Dublin, Ireland

Introduction: MND is increasingly being conceptualised as a disease
which impacts the family unit. Research investigating family carer
experience is available however research aimed at understanding therapeutic exchanges which take place in the management of specific aspects of MND, such as dysphagia, is lacking. An in-depth understanding of the experience of dysphagia is required to facilitate care which is proactive rather than reactive and appropriately addresses family carer needs. This study offers an exploration of the dysphagia experience for family carers of people with MND (PwMND). Methods: A hermeneutic-phenomenological approach to qualitative enquiry was used with individual semistructured interviews the primary method. Four interviews were conducted with bereaved carers recruited through a voluntary agency. Interviews were audio-recorded, transcribed and analysed thematically in order to identify the essence of the experiences. Results: Two of the main themes identified through thematic analysis of the data are presented: balancing needs and agendas and information as a means of empowerment. These themes capture the multifaceted nature of the relationship between professional and informal carers of PwMND and highlight the importance of this relationship in the total illness experience for family carers. Conclusion: This study adds to the evidence supporting conceptualisation of MND as an illness which affects the family unit; it emphasizes the importance of the working relationship not only between healthcare professionals and PwMND but between healthcare professionals and family carers. Understanding family carer’s subjective experiences of dysphagia may shape healthcare professional’s thinking in relation to how they interact with family carers when managing feeding, eating, drinking and swallowing difficulties. Additional evidence is required to inform practice.

PPE.2 EFFECTS OF ELECTRICAL STIMULATION NEUROMUSCULAR IN
REHABILITATION OF ORORHYPHENAGE DYSPHAGIA IN A MULTIPLE
SCLEROSIS CASE
L.L. Tomasij; I.S. Strassburg; B.F.T. Gonçalves; B.T.L. Guimarães; R.
Mancone/ Universidade Federal de Santa Maria, Brazil

Introduction: dysphagia rehabilitation occurs through direct and indirect therapy swallowing and can be combined with application of Neuromuscular Electrical Stimulation (EENM), noninvasive technique, applied through electrodes transectaneous form, associated with functional activities, acting as re-educator the swallowing mechanism. Multiple sclerosis (MS) is a chronic demyelinating and neurological disorder of the central nervous system (CNS) and its symptom depends on the location of the lesion, and may bring the dysphagia as manifestation of clinical disease. Material & methods: a case study subject with multiple sclerosis. It was effected videofluoroscopy swallowing review pre- and post-speech therapy for dysphagia rehabilitation, using direct and indirect therapy associated to EENM, using a transectaneous neuromuscular stimulator equipment coupled with application of adhesive electrodes in the submandibular and laryngeal region, seeking strength and muscular functionality. The analysis of the evaluations took place through a range which includes temporal and visuo perceptual variables of swallowing. The variables were analyzed by three judges with experience in videofluoroscopy analysis of swallowing. After, the statistical analysis was effectuated. Results: there was no statistical difference between variables, however, there was variation in the number of post-therapy swallows in the liquid, solid and honey, variation in oral transit time of all of them, pointing to improvement in the preparation of bolus post-therapy, and increased pharyngeal transit time in the liquid (0.78-1.82s) and solid consistency (2.63-3.06s), suggesting increased the amplitude of the complex hio laryngeal movement. Conclusion: the application of EENM in MS patients seems to be an important resource of treatment for swallowing disorder. Further studies are needed with larger samples and longer time of application of the technique in order to verify the effects on biomechanics of swallowing.

PPE.3 FACTORS PREDICTING THE PERSISTENCE OF DYSPHAGIA IN
HOSPITALIZED OLDER INDIVIDUALS
Y. Kuroda/ St. Francis Hospital, Japan

Background: Many older individuals experience dysphagia during hospitalization. The symptoms can be transient or persistent. Recent studies have shown that physical and nutritional status is associated with the condition. The aim of this study was to determine the factors associated with the persistence of dysphagia in hospitalized older individuals. Material & Methods: A total of 133 hospitalized older individuals with dysphagia (53 men and 80 women, with a mean age of 85.6 years) were enrolled. The subjects were divided into two groups: the oral intake group (n = 91) achieved sufficient oral intake during the hospitalization, while the non-oral intake group (n = 42) did not (i.e., resulting in poor oral intake). Swallowing function was measured with a graded water swallowing test (GWST) and a food intake level scale (FILS). Functional status was measured with a physical dependency scale and a comprehension scale. Nutritional status was measured with mid-upper arm circumference (MUAC), calf circumference (CC), and serum albumin lev-
Denmark; Frederikshavn Municipality, Denmark; Hjoerring Municipality and a dietician in the municipalities visited the patient 21 days after discharge. An occupational therapist continuously included and screened for dysphagia with the standardised volume-viscosity swallow test (V-VST). Patients with dysphagia and CAP were discharged after a mean of 9.6 days as compared to a mean of 7.9 days for patients with CAP. A clinical relevant difference was given between the two groups according to admissions 6 months before the diagnosis of dysphagia (P=0.065). This difference was reduced after the diagnosis of dysphagia and the intervention in the municipalities was given (P=0.586). The final results will be presented at ESSD2015.

Conclusions Close cooperation between the hospital and municipalities around the rehabilitation of patients with dysphagia seems to be able to reduce the number of readmissions.

PPE.6 A MIXED METHODS STUDY EXAMINING THE EXPERIENCES OF DYSPHAGIA FOR PEOPLE WITH MULTIPLE SCLEROSIS (MS)

A. Barrett; M. Walshe; A. Careyl Trinity College Dublin, Ireland

Introduction: Multiple Sclerosis (MS) is a progressive neurological disease. Oropharyngeal dysphagia is prevalent in between 34.3% and 43% of individuals with MS. However, little is known about the impact or experience of dysphagia for these individuals. This is important in order to deliver high quality personalised care to this population. This study aims to examine the experiences of living with dysphagia for people with MS. Methods: 6 individuals with dysphagia and MS were recruited. The Dysphagia Handicap Index, the Dysphagia in Multiple Sclerosis Questionnaire and the Functional Oral Intake Scale were completed. Qualitative data was obtained using individual unstructured interviews. Data from quantitative measures and qualitative interviews were triangulated. Results: While all participants were homogenous in term of oral intake methods, self-reported or perceived dysphagia severity varied between participants. Qualitative data provided an in-depth understanding of life with dysphagia due to MS. Emerging themes were “Dynamic adjustment to the eating and drinking process”, “Evolving roles and relationships”, “Quotidian participation”; “Dysphagia in the context of other disabilities” and “Reaching acceptance”. Participants’ experiences were influenced by a wide array of personal and contextual factors. They described how they compensated and adapted to life with dysphagia and MS. Although the progression was continuous, change was gradual. Maintaining control and developing coping strategies were described. This study found that responses measured on the DHI and DYMUS scales were in...
agreement with each other and with the qualitative data. Conclusion: The impact of dysphagia on individuals with MS is highly individual but there are common themes. Perceived dysphagia severity was observed to be unrelated to functional oral intake. The rich qualitative data revealed that the experiences of dysphagia and MS are inseparable and influenced by a multitude of factors.

PPE.7 PREVALENCE AND RISK FACTORS FOR GERIATRIC DYSPHAGIA
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Introduction: Geriatric dysphagia is becoming an increasingly needful area as the population ages across many countries. Aged care staff and caregivers for the elderly are often ill equipped to deal with swallowing difficulties as there is limited knowledge of the occurrence and risk factors in this population and setting. This study aimed to identify following difficulties as there is limited knowledge of the occurrence and risk factors in this population and setting. This study aimed to identify the prevalence and potential risk factors for geriatric dysphagia that will assist in forward the email to their own contacts across the world. Email invitations were distributed to known contacts with encouragement to forward the email to their own contacts across the world. The purpose being, to recruit many people anonymously in many different countries. Results To date, 1293 people have completed the online questionnaire, from 30 countries (UK, 38.5%; USA 48.49%) and 45 identifiable nationalities. 81% of the respondents are female, with a median age of 35 years (mean, 37.8, range 5-88). Although, the majority of people had no problems swallowing, 411 (31.66%) reported some difficulty swallowing tablets, 237 (18.33%) reported food sticking in their throat and 205 (15.85%) reported coughing when swallowing. Conclusion: Swallowing problems are not common in the younger population, but are nonetheless present and are undiagnosed and as a consequence not managed. It is not known what underlies the problems that people report.

PPE.8 DYSPHAGIA: A COMMUNITY TIME BOMB?
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Introduction: Data are emerging on swallowing in the general population. Cross sectional prevalence of dysphagia in younger community dwelling adults is unknown. There is a particular absence on the international perspective as well as in the younger age groups. Studies of older people, suggest a prevalence of 20-30% of community dwelling older people have dysphagia. Recent studies have suggested that 5.4% of young adults may also have dysphagia. Materials and Methods: An online survey using the EAT-103 assessment as a base was developed with additional questions from the original paper. Demographic questions were added (sex, age, nationality and country of residence). Email invitations were distributed to known contacts with encouragement to forward the email to their own contacts across the world. The purpose being, to recruit many people anonymously in many different countries. Results To date, 1293 people have completed the online questionnaire, from 30 countries (UK, 38.5%; USA 48.49%) and 45 identifiable nationalities. 81% of the respondents are female, with a median age of 35 years (mean, 37.8, range 5-88). Although, the majority of people had no problems swallowing, 411 (31.66%) reported some difficulty swallowing tablets, 237 (18.33%) reported food sticking in their throat and 205 (15.85%) reported coughing when swallowing. Conclusion: Swallowing problems are not common in the younger population, but are nonetheless present and are undiagnosed and as a consequence not managed. It is not known what underlies the problems that people report.

PPE.9 CLINICAL EXAMINATION OF ORAL STRUCTURES AND SWALLOWING IN PATIENTS WITH DUCHENNE MUSCULAR DYSTROPHY AND SPINAL MUSCULAR ATROPHY TYPE 2 - A PILOT STUDY
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Introduction: Problems with oral structures, oral functions, mastication and swallowing are reported in patients with Duchenne Muscular Dystrophy (DMD) (1). Spinal Muscular Atrophy (SMA) Type 2 is also characterized by bulbar weakness with swallowing difficulties (2). The aim of this study was to document the mastication, swallowing, oral structural and functional problems in these patient population. Methods: Twelve DMD patients (mean age: 9.63±3.13 years), 7 SMA Type 2 patients (mean age: 8.42±3.77 years) were included in this study. Clinical examination of oral structures and functions, 3 ounce water swallowing test (3) were performed by a swallowing expert. Descriptive data of the patients were shown with statistics of frequency distribution. Results: Malocclusion, excessive height of hard palate, macroglossia, difficulty in swallowing viscous and solid foods, excessive soreness on masticator muscles during mastication, wheezing were documented in both DMD and SMA Type 2 patients according to clinical examination of oral structures and functions. Tongue fasciculation, trismus, coughing during feeding, impaired voice quality and volume and recurrent pulmonary infection were documented in only SMA Type 2 patients. Although all DMD patients succeed in 3 ounce water swallowing test, 2 SMA Type 2 patients failed to complete it (Table 1). Table 1. Documented problems in patients Discussion: This study suggests...
that oral and swallowing problems are frequently observed in patients with neuromuscular diseases. More severe problems were observed in SMA Type 2 patients than DMD patients. This study suggested that it is important to determine the swallowing related problems earlier in these progressive neuromuscular diseases especially in SMA Type 2 to prevent the further problems, enhance survival time and provide better life quality.

PPE.10 FIBEROPTIC ENDOSCOPIC EVALUATION OF SWALLOWING AND FOOD CONSISTENCY IN THE AMYOTROPHIC LATERAL SCLEROSIS

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Introduction: The swallowing disorders in neurodegenerative diseases are significant and these disorders can vary with different food consistency. This study aims to describe the findings of the pharyngeal phase in two food consistencies in individual with Amyotrophic Lateral Sclerosis (ALS). Material & Methods: Retrospective cross-sectional clinical study. We analyzed 18 exams (fiberoptic endoscopic evaluation of swallowing) the individuals with ALS, regardless of the type and stage of the disease, with aged 26 to 78 years, 9 female and 9 male. We used nasofibroscope Pentax FNL-10RP3 with Image Capture System Zscan 6 ENT and we offered puree and liquid consistency in volume 5-10 ml. We analyzed the following parameters: laryngeal sensitivity, posterior oral spillage, pharyngeal residue, laryngeal penetration and tracheal aspiration. Results: All individuals had presence of laryngeal sensitivity. For the puree consistency, we observed 44.4% individuals with posterior oral spillage; 55.5%, pharyngeal residue; 16.7%, laryngeal penetration and 5.6%, aspiration with cough. For liquid consistency, we observed 77.8% individuals with posterior oral spillage; 27.8%, pharyngeal residue; 27.8%, laryngeal penetration; 11.1%, aspiration with cough and 11.1%, silent aspiration. Conclusion: There was higher frequency of posterior oral spillage with liquid consistency and pharyngeal residues with puree consistency.

PPE.11 LARYNGO-PHARYNGEAL REFLUX DISEASE: THE HIDDEN CAUSE OF FAILURE TO THRIVE DURING FIRST YEAR OF LIFE

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Introduction: LPRD is defined by the reflux into the larynx, oropharynx, and/or nasopharynx or the non-forceful regurgitation of milk and other gastric contents into the oesophagus. More significant LPRD is also common in infancy (at least 40% of infants), usually begins before the infant is 8 weeks old, may be frequent (5% of those affected have six or more episodes each day) and usually becomes less frequent with time (resolves in 90% of affected infants before aged 1 year). LPRD is believed to contribute to a variety of conditions, including failure to thrive (Venkatesan et al., 2013). Subjects and Methods: 20 infants were assigned from the phoniatrics unit, ENT Department, faulty of medicine, Cairo university during the period from October 2014- March 2015. Their age ranged from 6 weeks to 9 months at the time of the study. The reason for referral was failure to thrive. All 20 subjects had history of incubation of 3-6 weeks, Premature birth 28-32 weeks, Low birth weight 1600-2000grams. Procedure: flexible nasopharyngolaryngoscopy plus trans nasal esophagoscopy down to LES. NG tube was removed 30 minutes prior to procedures. No oral intake 2 hours prior to procedure. A Checklist list was applied to tabulate the findings, it included 5 items: Pharyngeal pooling, Penetration-Aspiration, Esophageal mucosal abnormality, Esophageal structural abnormality, Reflux through LES. Results: 70 % of the subjects had pooling in both piriform fossae and and postcricoid area, 60% had penetration of pooled secretion, 40% had aspiration of pooled secretions – silent aspiration, 70% had hyperemia of the pharyngeal and esophageal mucosa and in 70 % reflux at the LES was evident during the examination. Conclusion: Evidence from this study and other studies link LPRD closely to failure to thrive in Neonates and infants. LPRD should be considered and managed early on when suspected to prevent against long term tube feeding in infants with failure to thrive.

PPE.12 MASTICATION MOVEMENT OF TYPICALLY DEVELOPING CHILDREN AND CHILDREN WITH CEREBRAL PALSY

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Introduction: Mastication in children with Cerebral Palsy (CP) is characterized by a reduced chewing speed and reduced muscle coordination. Consequently, children with CP are at greater risk of choking, aspiration, impaired digestion and impaired natural dental cleaning. The aim of this study was to compare data on mastication in children with CP and typically developing children, in order to gain insight in differences in kinematics and muscle activation. Method/Materials: Fifteen typically developing children (mean age 9.15; range 8.01-11.11) and eight children with CP (mean age 9.11; range 8.01-11.03) participated in the study. They visited the laboratory for two sessions at one day. One session consisted of sEMG and kinematics measurements, the other session of dynamic ultrasound measurements. In both sessions children were offered five pieces of a crunchy biscuit (1.5 x 1.5 cm). Results: The bites of children with CP compared to those of the typically developing children are characterized by a significant longer total time (15.74 sec. versus 7.81 sec.), higher amount of chew cycles (13.8 versus 10.4), and a smaller closing velocity (43.0 mm/sec. versus 59.9 mm/sec.) and smaller opening velocity of the mandible (52.6 mm/sec. versus 78.3 mm/sec.). From ultrasound measurements the tongue movements showed a smaller horizontal displacement (0.7 mm. versus 0.9 mm.) and smaller vertical displacement (0.47 mm. versus 0.59 mm.). Conclusion: Mastication movements of children with CP differ from typically developing children; in particular the mastication process is slower.
Introduction. Dysphagia is a common problem in children with repaired esophageal atresia (EA). Abnormalities in the oropharyngeal and esophageal phase have hardly been studied, neither the prevalence nor the variety of these abnormalities. The aims of this study were (1) to report the prevalence of dysphagia in children with repaired EA; (2) to identify and differentiate oral and pharyngeal dysphagia based on videofluoroscopic swallow study (VFSS) findings in a limited number of children. Material and methods. Medical records of 111 patients, born between January 1996 and July 2013, treated at the Radboudumc Amalia Children’s hospital were retrospectively reviewed. The prevalence of dysphagia was determined by the objective Functional Oral Intake Scale (FOIS) (modified for children) in four age groups: <1, 1-4, 5-11 and 12-18 years. In addition, the first performed VFSS of 13 children was reviewed according to a structured procedure. Results. The prevalence of dysphagia was 55% (61/111) in age group <1 year. The prevalence of dysphagia decreased from 51% (54/106) to 17% (11/64) and 21% (5/24) in respectively age group 1-4 years, 5-11 years and 12-18 years. The percentage of tube feeding dependent patients decreased from 42% (47/111) in age group <1 year to 4% (1/24) in age group 12-18 years. The review of the 13 VFSS’s revealed oral dysphagia in 33% and pharyngeal dysphagia in 77% of the children. Conclusions. Oropharyngeal dysphagia appears to be a significant problem in children with repaired EA. This study emphasizes the need to standardize the use of objective dysphagia scales in follow-up of children with repaired EA. In addition, when dysphagia is identified by using a rating scale, like the modified FOIS, VFSS imaging should be considered. Using an objective dysphagia scale by clinicians and the performing of a VFSS in children with (repaired) EA are necessary to give tailored advice for feeding and swallowing in this patient group.
ordinating sucking, swallowing and respiration. The Early Feeding Skills (EFS) Assessment is a tool with 36 items to assess infant readiness for oral feeding, and to evaluate infants response to a feeding (3). Based on the EFS, we developed a short version with 12 items: the Checklist Oral Feeding (COF). Items 1 to 4 are observed and scored previous to the moment of oral feeding. Items 5 to 12 are observed and scored during and directly after oral feeding. The COF can be used by nurses in neonatal intensive care units or by speech-language therapists to determine whether an infant can accomplish safely and effectively oral feeding. The aim of this study was to investigate the interrater and intrarater reliability of the COF. Material & Methods: In 4 hospitals in the Netherlands, 47 protoculled videotapes of oral feedings in preterm infants were made. Experts in neonatal feeding, i.e. nurses or speech-language therapists, scored the COF directly after the feeding moment. For the interrater reliability 10 videotapes were randomly selected. Two students who received a training, viewed the tapes and scored the COF independently. One expert also scored the COF based on the videotape. For the intrarater reliability 30 videotapes were scored twice by the students and 15 by the experts. Results: The interrater reliability, based on 40 completed COF’s of the two students and two experts was good, with an Intraclass Correlation Coefficient (ICC) of 0.84. Intrarater reliability of the experts and students was also good, with an ICC of 0.95 and 0.98, respectively. Conclusions: The COF is a reliable short checklist for preterm infants and students was also good, with an ICC of 0.95 and 0.98, respectively.

**PPF.7 DYSPHAGIA IN THE CONTEXT OF THE POSTERIOR FOSSA SYNDROME AFTER CEREBELLAR TUMOR SURGERY**

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Purpose: Swallowing dysfunction is a common sequel of tumor resection in the posterior fossa area. After surgery in this area (where the cerebellum and the brainstem are situated), children may develop posterior fossa syndrome (PFS). Mutism and severely reduced speech are the most remarkable symptoms of PFS, but also ataxia, pareses, eye movement disorders, behavioral symptoms and dysphagia are common. In a few articles on PFS, dysphagia is mentioned, but the expected course of recovery of the swallowing function is not described. Also, questions remain on the relationship between recovery from mutism and the decrease of dysphagia. The aim of this study is to clarify the course of dysphagia in children with PFS after cerebellar tumor surgery, with a focus on prognostic factors for recovery. Methods: Retrospective cohort analysis in children who were surgically treated for medulloblastoma between 2005-2015. Medical history of these children and data on dysphagia and speech were obtained from the electronic patient record of Sophia Children’s Hospital. Results: 43 children (72% male) surgically treated for medulloblastoma in the posterior fossa area were included. 18 children (42 %) developed PFS after surgery. Nine (50 %) had swallowing difficulties in oral and pharyngeal phase. Six of them were observed in detail. In all six children we saw that when the apraxia decreased within mouth and tongue, thick liquids seemed save. In four of the children there was still aspiration in thin liquids months after surgery. Intake of solid foods correlated with the absence of facialis paresis or ataxia. Improvement of swallowing did not directly correlate with decrease of mutism or vice versa.Conclusion: Children after cerebellar tumor surgery have a high risk to develop dysphagia, more specifically when they develop PFS. They should all be examined, and in case of dysphagia treated, by a speech therapist in order to reduce the risk of aspiration pneumonia.

**PPF.8 KARADUMAN CHEWING PERFORMANCE SCALE: THE CONTENT VALIDITY STUDY**

S. Serel; N. Demir; A.A. Karaduman; Hacettepe University, Turkey

Introduction: Chewing disorders are common among pediatric population. Chewing function is assessed depending on observational, non-standardized clinical decision and there is no instrument to evaluate the chewing functions’ steps. The aim of the study was to develop a reliable and valid scale which determine the chewing function level of children and evaluate the content validity of the scale. Material-methods: KCPS which was developed in Hacettepe University was rated chewing function between 0-7 at first. 0 indicated normal, 7 indicated worst chewing function. This first version was separated according to presence of GAG reflex. GAG reflex was removed from the classification because it is not directly related to chewing. The final version was between 0-4. The seven expert’s opinion was taken for content validity. The multidisciplinary team included four physiotherapists, one dentist, one gastroenterologist and one dietitian. Each scale parameters and assessment procedure were clarified through the examples in first meeting. After explanations, each expert scored each step 0-10 in terms of relevance and validity. 0 means the worst, 10 means excellent. It was also asked if there is a section which required to add something or totally remove for each step. Each expert’s comments were collected and made a consensus in the second meeting. Content validity index was calculated. The score of each expert was collected and divided by the number of experts. RESULTS: The mean score of the experts was 98±2.3 according to content validity index. The steps called 0, 3 and 4 were scored as 10, step 1 was scored as 9.2±1.2 and step 2 was scored as 9.8±0.4. The scale steps were all found necessary and appropriate. Conclusions: It was shown that KCPS was a usable scale in terms of content validity. This scale is appropriate in terms of content to evaluate and grade chewing function and is a good candidate assessment tool to fill the gap in the literature about chewing evaluation.

**PPF.9 FINGER STIMULATION PROTOCOLS PRIOR TO ORAL OR GAVAGE FEEDS TO PROMOTE ORAL FEEDING IN PRETERM INFANTS: A SYSTEMATIC REVIEW OF THE EVIDENCE**

A. Carey; M. Walshe; Z. Greene; A. Barrett/ Trinity College Dublin, Ireland

Background: Preterm infants (<37 weeks gestational age (GA)) frequently experience oral feeding difficulties due to their global immaturity impacting on their ability to coordinate sucking, swallowing, and breathing patterns. As a consequence preterm infants require enteral milk feeding until attainment of independent oral feeding is achieved. Finger stimulation protocols are interventions which target oral feeding difficulties aimed at reducing the transition time to independent oral feeding. The aim of this study is to examine the efficacy and safety of
finger stimulation protocols prior to feeds (gavage or oral) with and without supports on oral feeding in preterm infants. Determining the efficacy of this intervention approach will inform best practice and clinical decision making as well as increasing the potential to reduce healthcare costs and improve resource management. Design and Methods: All published and unpublished randomised control trials (RCTs) and quasi-randomised control trials examining the efficacy of finger stimulation protocols in promoting oral feeding in preterm infants published in all languages were sought. A range of electronic data bases were searched from inception to April 2015. Data was extracted and analysed independently by two reviewers. Results & Discussion: Eleven studies were eligible for inclusion in this review. The methodological quality of these studies was assessed using Cochrane risk of bias tool. The overall quality of the studies varied. Results suggests that finger stimulation protocols show promise as an intervention but more rigorous studies are needed. Clinical implications and directions for research studies on this intervention are discussed.

PPF.10 COMPARISON OF CHEST COMPUTED TOMOGRAPHY FINDINGS OF SEVERE MOTOR AND INTELLECTUAL DISABILITY PATIENTS BETWEEN ASPIRATORS AND NON-ASPIRATORS

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Purpose: Oral ingestion in severe motor and intellectual disability (SMID) patients, such as those with cerebral palsy, is associated with an increased risk of aspiration pneumonia. Therefore, in order to safely continue oral ingestion, it is important to detect aspiration early and perform appropriate management such as the restriction of food textures and changes in the rate of oral feeding. However, we also often encounter SMID patients that do not develop aspiration pneumonia with oral ingestion. Therefore, the effects of aspiration need to be evaluated in the lungs of these patients. In this pilot study, we compared the computed tomography (CT) findings of SMID patients between aspirators and non-aspirators. Materials and Methods: Eighty-three SMID patients participated in the present study (mean age 14.9±10.1). The underlying diseases of these patients included cerebral palsy, chromosome aberrations, and neuromuscular diseases. All patients were identified from the patients of our Department who had previously undergone an endoscopic evaluation (VE) and had been identified as 1) prandial aspirators or non-aspirators and 2) saliva aspirators or non-aspirators at that time. The findings of chest CT were acquired within one week of the VE procedure. We determined whether any differences existed between the acute or chronic inflammation findings of the lung parenchyma and airways in aspirators and non-aspirators. Results: No significant differences were observed in the CT findings of prandial aspirators and non-aspirators (P = 0.90), whereas significant differences were noted in the CT findings of saliva aspirators and non-aspirators (P < 0.01). Conclusion: The results of the present study showed that, among SMID patients, 1) a risk assessment of pneumonia may be difficult in the presence or absence of prandial aspiration only, and 2) the status of saliva aspiration may become an indicator of the severity of aspiration and also be useful in the management of dysphagia.

15:30 - 16:00 Hall Session 07G Poster viewing, Physical and compensatory treatments

PPG.1 EFFECTS OF RESPIRATORY MUSCLE EXERCISE IN THE SWALLOWING OF NORMAL SUBJECTS

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Introduction: Swallowing is influenced indirectly by the dynamic action of the hyolaryngeal complex when the pharynx acts in a contractile way to protect the airway during swallowing. Troche et al.1 carried out a study in which they demonstrated the importance of respiratory muscle training, through the use of expiratory incentive for rehabilitation of dysphagia to a better function of the hyolaryngeal complex. However, studies that evaluated the effects of respiratory muscle exercise with incentive spirometry (IS) in the swallowing of normal subjects were not found. The aim of this study was to analyze the effects of IS use in the biomechanics of swallowing in normal subjects. Material & methods: Prospective and longitudinal study. The respiratory training was administered for seven consecutive days with the use of a flow-oriented incentive spirometry (three sets of ten repetitions for inspiration and expiration). The biomechanics of swallowing was evaluated by videofluoroscopy (pasty offer in spoon of 10 ml), through temporal variables (pharyngeal transition time) and also visuoperceptual ones (number of swallows, waste in the pyriform sinuses and valleculae, penetration/aspiration)3, by two blinded and experienced evaluators in videofluoroscopic analysis of swallowing. For statistical analysis we used the Wilcoxon test, Two-Proportion Equality and Kappa. Results: 16 young women with a mean age of 21.2 ± 3.4 were evaluated. In visuoperceptual variables (p < 0.001) and time variable they were verified almost perfect agreement between evaluators (p = 1.00). After the respiratory muscle exercise, a significant difference on the pharyngeal transition time (BTT) (p = 0.02) was observed, reducing it by approximately 0.09 seconds after the training. Conclusion: It was possible to infer in this work that the decrease in the BTT of the pasty consistency in the sample submitted to the respiratory training may be related to increased mobility of the hyolaryngeal complex.

PPG.2 QUANTITATIVE EVALUATION OF THE SUPRAHYOID MUSCLES ACTIVITY USING A TONGUE TRAINING INSTRUMENT MADE OF THERMOPLASTIC ELASTOMER RESIN NAMED “PEKO-PANDA”

S. Sato; T. Okamoto; H. Otaki / Nishi-Hiroshima rehabilitation hospital, Japan

(Introduction) In the training for dysphagia, the isometric exercise in which a patient, by raising the tongue, compresses a stick-like material on the tongue to the hard palate is widely used as a lingual-muscle-strengthening method. The materials on the tongue include a spoon, a tongue spatula (TS), a trainer’s finger or others. As one of such materials, an instrument named “Peko-panda” (PP) has been developed. We quantitatively evaluated its availability. (Materials & Methods) The PP is an oblong plate made
of thermoplastic elastomer resin. Its anterior part has a compressible hollow hemisphere. In training, a patient, by elevating the tongue, depresses this part to the hard palate. The PP is classified into 3 types, a soft type, an intermediate one and a hard one. In 12 healthy men in their twenties, action potentials of the suprathyroid muscles were recorded with a surface EMG, when they, by lifting their tongues at maximal power, compressed 4 instruments; a TS and 3 type of PP respectively to the hard palate for 3 seconds. They were measured in 2 different postures, i.e., in the vertical sitting posture and in the lying one with the back elevated 30 degrees from the horizontal plane. The elements of the waveforms in a trial were digitally extracted and formed into an absolute value, with which root mean square was calculated as suprathyroid muscles activity (SHMA), and statistically compared among 4 groups in 2 postures. (Results) The SHMA was not significantly different among 4 groups in each posture. There was also no significant difference in the SHMA between 2 postures. Though not significant, there was a tendency in each posture that the harder the PP was, the higher the SHMA was. (Conclusions) In the lingual training, the PP can work equivalently as TS heretofore used. So the PP can be used for patients who cannot sit vertically. And with different kinds of compressibility, the PPs could be used in a stepwise fashion according to the stage of dysphagia.

**PPG.3** THE EFFECTIVENESS OF THE HEAD-TURN-PLUS-CHIN-DOWN MANOEUVRE FOR ELIMINATING VALLECULAR RESIDUE
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Introduction: When swallowing efficiency is impaired, residue collects in the spaces of the pharynx. Residue is also thought to increase the risk of post swallow aspiration. Cued or spontaneous clearance swallows in a head neutral position do not always successfully clear residue. We investigated the impact of a novel manoeuvre on residue clearance by combining a head turn with the chin down posture. Material and methods Data were collected from 26 participants who demonstrated persistent vallecular residue after an initial head neutral clearance swallow in videofluoroscopy. Participants were cued to perform a head-turn-plus-chin-down clearing swallow, with the direction of the head turn randomized across participants. Pixel-based measures of the amount of residue in the vallecular space before and after the manoeuvre were made by blinded raters using ImageJ. Measures of %-ful and the Normalized Residue Ratio Scale (NRRS) were extracted. Univariate analyses of variance were used to detect significant reductions in residue in the manoeuvre. Results On average, pre-manoeuvre measures showed residue filling 56-73% of the vallecular space, depending on stimulus consistency (NRRS scores: 0.2-0.4). More than 80% of pre-swallow measures displayed NRRS ratios >0.06; this threshold has previously been linked to increased risk of post-swallow aspiration. The head-turn-plus-chin-down manoeuvre reduced residue below this threshold 15% of the time, achieving significant reductions in pixel based measures (p < 0.05). Post-manoeuvre measures showed residue filling 21-36% of the valleculae for thin and nectar-thick liquids (NRRS: 0.04-0.11) and 45-62% for honey-thick and solid stimuli (NRRS: 0.17-0.41). Conclusions These data suggest that the novel head-turn-plus-chin-down manoeuvre can be an effective strategy for reducing persistent vallecular residue, particularly with thin and nectar-thick stimuli.

**PPG.4** THE COMPARISON OF CHIN DOWN VS. NEUTRAL POSTURE SWALLOWING EXERCISE ON LINGUAL STRENGTH IN HEALTHY INDIVIDUALS: DOUBLE-BLIND RANDOMIZED CONTROLLED TRIAL
J. Park; H. Hong; G. Sim / Dongguk University Ilsan Hospital, Korea, Republic of

Introduction: The tongue exercise increases lingual strength in healthy individuals and also results in improved swallowing function in abnormal populations. However, almost all training programs use isometric exercises which are not inconsistent with the training specificity principle and it is also difficult to follow the overload principle. On the other hand, chin down posture increased the tongue driving force during small boluses swallow. We thought chin down swallowing exercise was more training specific and adhered to the overload principle. Therefore, we tried to reveal the effects of the swallowing exercise in chin down posture on lingual strength comparing to the neutral effortful swallowing exercise. Material and methods: Twenty-one healthy volunteers were randomly divided into two groups. One group (chin down swallow group, n=11) performed 5ml water swallowing in chin down posture every 5 second for 20 minutes. One session consisted of two 10 min exercises with a 5 min rest period provided between exercises to avoid muscle fatigue. A total of 12 sessions of training for 4 weeks were performed. The other group (neutral effortful swallow group, n=10) swallowed 5ml water effortfully in neutral posture for the same length of time as a control. Blinded lingual strength measures were obtained using the Iowa Oral Performance Instrument (IOPi) before and after 4 weeks of training in both groups. Results: After 4 weeks of training, lingual strength measures (maximal isometric pressure) were increased significantly in both groups. However, there were no differences of strength increment between two groups. Conclusion: Swallowing exercise in chin down posture increased lingual strength in healthy individuals. However this training was not superior compared to effortful swallowing exercise.

**PPG.5** EFFECTS OF APPLICATION OF THICKENING AGENT ON MUCOCILIARY TRANSPORT TIME
K. Nohara¹; E. Ai¹; H. Fukatsu²; N. Tanaka²; T. Sakai¹ / ¹Osaka Univ. Graduate School of Dentistry, Japan; ²Osaka Univ. Dental Hospital, Japan

Introduction: The thickening agent is applied to the liquid to prevent dysphagic patients from aspirating, leading to pneumonia. It was reported that the drinking of high-viscosity liquid daily by patients is associated with greater morbidity due to aspiration pneumonia than in those drinking low-viscosity liquid. These results suggest that the thickening agent reduces the risk of aspiration, but makes excretion of the aspirated liquid difficult. We examined the effect of the thickening agent on mucociliary transport, which performs an important role in the excretion of aspirated liquid. Material & Methods: Subjects were 12 healthy adult volunteers. We prepared nectar-like and honey-like viscosity liquids of 0.3% (m/v) saccharin solution using two types of thickening agent: starch-gum-based and gum-based. The mucociliary transport time was
evaluated by measuring the saccharin time (ST), which is the time from when the prepared liquid (0.025 mL) was applied to the anterior border of the inferior concha to when the subject sensed sweetness in the pharynx. Results: With the starch-gum-based thickener, the mean ST of the honey-like liquid (21.5 ± 8.9 minutes) was significantly longer than that of the nectar-like liquid (13.5 ± 6.6 minutes). With the gum-based thickener, the mean ST of the honey-like liquid (23.3 ± 6.4 minutes) was significantly longer than that of the nectar-like liquid (17.7 ± 4.8 minutes). There was no significant difference between the starch-gum-based and gum-based thickener with the same viscosity. Conclusions: These results suggest that the high-viscosity liquid is more difficult to excrete by mucociliary transport than the low-viscosity liquid if it is aspirated into the trachea regardless of the type of thickening agent.

PPG.6 SENSORY ENHANCEMENT PRACTICES WITHIN AUSTRALIAN VIDEOFLUOROSCOPY SWALLOW STUDY (VFSS) CLINICS.

L. Turkington1; R. Nund2; E. Ward3; A. Farrell1 / 1Royal Brisbane and Women’s hospital, Australia; 2University of Queensland, Australia; 3The University of Queensland, Australia

Introduction Speech pathologists use sensory enhancement along with other compensatory techniques during clinical swallowing assessment and videofluoroscopic swallow studies (VFSS) to reduce symptoms of dysphagia. The use of SES in VFSS was described by Logemann (1993) and other descriptions occur of within VFSS changes to taste, temperature, bolus size, viscosity and texture of boluses. Investigation of symptom reduction, associated with SES during VFSS, has been described with use of sour boluses, cold boluses and carbonated liquids as well as mixing capsaicinoids in test materials during VFSS. These results suggest that the high-viscosity liquid is more difficult to excrete by mucociliary transport than the low-viscosity liquid if it is aspirated into the trachea regardless of the type of thickening agent.

PPG.7 IMPROVEMENT OF DYSPHAGIA IN POST CEREBROVASCULAR ACCIDENT PATIENTS USING THE FUNCTIONAL ORAL INTAKE SCALE (FOIS)

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Introduction: The CVA is the cardiovascular disease that results in the greatest level of morbidity. Dysphagia is the most serious common impairment among patients with CVA and is present in 43% to 86% of the cases. The frequency and severity of dysphagia after CVA calls for early and specialized treatment. Therefore, the purpose of this study is to assess the effectiveness of Speech-Language Pathology treatment of patients with Cerebrovascular Accidents with dysphagia, using the functional oral intake scale as a marker. Method: A retrospective study was conducted through the survey of the medical records of post CVA patients with diagnosis oropharyngeal dysphagia, treated in the hospital bed by the Speech-Language Pathologists of the Speech-Language Pathology Department of the São Camilo Hospital, Ipiranga division in the city of São Paulo-SP, using the FOIS scale as a marker of the improvement of these patients’ swallowing. Results: Among the 18 dysphagic patients assessed using the FOIS and who underwent Speech-Language Pathology treatment, 50% had improvements in dysphagia after treatment, 11.1% became worse and 38.9% did not have changes in their clinical condition. Among the dysphagic patients using a feeding tube, 16.6% worsened after Speech-Language Pathology intervention, 66.6% improved and 16.7% had no changes. Among the individuals who were not using a feeding tube, 8.3% worsened, 41.7% improved and 50% had no changes. The patients with feeding tubes had an average of 17 Speech-Language Pathology sessions, and the patients without feeding tube had an average of 5 sessions. Of the patients breathing environment air, 13.3% worsened after Speech-Language Pathology intervention, 46.7% improved and 40% had no changes. Of those 02, 0% worsened, 66.7% improved and 33.3% showed no difference. Conclusion: Patients with cerebrovascular accident with dysphagia as sequela benefitted from Speech-Language Pathology intervention at the hospital, improving their grade in the FOIS scale.

PPG.8 INFLUENCE OF THE CONDITIONS FOR BLOWING ON THE ORBICULARIS ORIS AND MYLOHYOID MUSCLES.

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Introduction In patients with velopharyngeal insufficiency (VPI), blowing training is frequently applied. Because the soft-blowing method, in which patients blow through a straw whose end is in water in a cup, can improve oral lip closure function, it is widely selected to improve the oral function of aged patients. However, there has been no detailed evaluation of the diameter and length of straws or viscosity of water, and these conditions are judged by training clinicians in hospitals and institutions. Therefore, in this study, we investigated the influence of such conditions for soft-blowing on the level of muscle activity of the orbicularis oris and mylohyoid muscles, and evaluated the load during soft-blowing.

Material & Methods The subjects were 10 healthy adults (mean age was 27.6±1.5 years) without objective or subjective abnormalities of the stomatognathic system. The posture during measurement was sitting at 90 degrees, the subjects held a container in which a straw was inserted into the test specimen, and blew through the straw to cause bubbling of the specimen for as long as possible. The length (L) of the straw was set at 10, 15, and 20 cm, the width (W) was set at 6, 10, and 15 mm, and evaluation was performed using 4 types of straw, combining these conditions. Furthermore, the concentration of the test specimens was set to 0, 2, 4, and 6% of the thickeners (Tsururinuko Quickly, Clinico Co., Tokyo) in 100 mL of water. The recording area of muscle activity was the orbicularis oris and mylohyoid muscles. Under these conditions, the
level of activity of each muscle was evaluated. Results A positive correlation between the level of activity of the orbicularis oris and mylohyoid muscles and the concentration of the test specimens was observed. Regarding the length and diameter of the straws, no correlation was noted. These results suggest that it is effective to adjust the load based on the viscosity of water during blowing training.

**PPG.9 SWALLOWING AND RESPIRATORY MUSCLE STRENGTH TRAINING IN SUBACUTE DYSPHAGIC STROKE PATIENT: A PROSPECTIVE STUDY**

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Background: Oropharyngeal dysphagia is highly prevalent in stroke patients. Respiratory muscle weakness may be responsible for impaired cough which results in greater incidence of bronchoaspiration and chest infections. Respiratory muscle training (RMT) have been suggested as innovative therapeutic strategies for the management of dysphagia as well as an effective technique for avoiding respiratory complications at 6-months follow up. Objective: The purpose of this study was to evaluate the effectiveness in swallowing of a 3-week RMT in subacute dysphagic stroke patients. Methods: Prospective, single-blind, randomized controlled trial was carried out in subacute dysphagic patients. Main outcomes were maximal respiratory pressures (PImax and PEmax), Penetration-Aspiration Scale (PAS), Functional Oral Intake (FOIS) and Volume-Viscosity Swallow Test (V-VST). A p-value <0.05 was considered as statistically significant. Results: 29 patients meet inclusion criteria. 16 were included in RMT group and 13 in conventional swallowing therapy (CST). Only patients in the RMT group showed a significant improvement in swallowing (p<0.003). No differences were noted regarding the length and diameter of the straws, no correlation was noted. Further stakeholder surveys were conducted mid-2015. Results The final international framework consists of 8 levels (0 to 7) and includes both objective research into texture modification and may pose a risk to patient safety. In 2012 the International Dysphagia Diet Standardisation Initiative (IDDSI) was launched to develop international standardised terminology and definitions for texture modified foods and liquids for individuals with dysphagia. Material & Methods Four stages were used to develop the international framework. A review of the published literature of existing national standards was completed and published in 2013. A systematic review of the evidence base for texture modified foods and liquids was published in 2014. An international survey of over 2000 respondents representing four stakeholder groups was conducted in 2014. All elements were considered by an expert multidisciplinary international panel in 2015 to develop a draft international standardized terminology and framework. Further stakeholder surveys were conducted mid-2015. Results The final international framework consists of 8 levels (0 to 7) and includes both foods and liquids on a single continuum. Levels are identified by numbers, text labels, and colour codes. Detailed descriptions are provided and practical objective tests of consistency are used to distinguish between levels. Conclusions An international framework for standardised classification of texture modified foods and liquids has been developed. A review of existing standards, available evidence and collaborative efforts with stakeholder groups has resulted in a framework that is culturally sensitive, measurable and applicable to individuals of all age groups in all care settings.
PHR.2 PHARYNGEAL RESIDUES AND ASPIRATION AND THE RELATIONSHIP WITH CLINICAL/NUTRITIONAL STATUS OF PATIENTS WITH OROPHARYNGEAL DYSPHAGIA SUBMITTED TO VIDEOFLUOROSCOPY

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Introduction: Oropharyngeal dysphagia (OD) can be a symptom of neurological, neurodegenerative (NDD), chronic respiratory diseases and head&neck cancer (HNC). Patients with OD can lead to impaired clinical and nutritional status. The aim of study was to investigate videofluoroscopic (VFS) signs of impaired efficacy (pharyngeal residues) and safety (aspiration) of swallow and the relationship with the clinical/nutritional status in patients with OD. Material & Methods: Clinical history (age, sex, diseases, comorbidities and weight/height) and VFS exams of patients (n=76), between 38-96 years (March 2011/December 2014). Swallow evaluation was tested with consistencies: liquid, nectar, honey, pudding and solid with barium contrast. Pharyngeal residues was considered as the presence of contrasted in the valleculae and/or pyriforms sinus after the swallow. Aspiration was defined as the passage of contrasted across the vocal folds. Nutritional status was diagnosis by the Body Mass Index (BMI), considering underweight BMI<18.5kg/m2. For data analysis was used the Poisson regression (Backward; p <0.20) and for the final model p <0.05 was considered. Results: In the adjusted analysis, underweight patients with presented higher prevalence of pharyngeal residues than to normally nourished (100% vs 77.8%) (PR 1.34, p=0.011). Pharyngeal residues was associated with male (PR 1.32, p=0.040), NDD (PR 1.57, p=0.021), stroke (PR 1.62, p=0.009), cerebral palsy (PR 1.76, p=0.006), and patients with HNC (PR 1.73, p=0.002). Aspiration was associated with HNC (PR 2.27, p=0.028) and cardiovascular disease (PR 1.96, p=0.027). Underweight was not associated with the presence of aspiration (p=0.532). Conclusion: Patients with OD and underweight presented an association with pharyngeal residues, but not with impaired safety of swallow. Underweight, male sex, stroke, NDD, cerebral palsy and HNC were associated with pharyngeal residue. Aspiration was associated with HNC and cardiovascular disease.

PHR.3 A STUDY ON DYSPHAGIC PATIENTS WHO DIED IN HOSPITAL

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[Introduction] Our hospital is an acute care facility with 1014 beds. Dysphagia rehabilitation is discussed on ward rounds conducted by a multidisciplinary team including a physiatrist, a dentist, a dental hygienist, a nurse, and a dietitian. This multidisciplinary team is generally providing care for more than 40 dysphagic patients. Despite these efforts, some of patients die in hospital. This study aimed to determine the factors predicting death in dysphagic patients. [Material and methods] 337 in-patients with dysphagia under the care of the multidisciplinary team between January and December 2014 were retrospectively investigated by reviewing their medical records. The clinical characteristics of the patients who died in hospital were analyzed. [Results] A total of 45 patients died in hospital. The underlying diseases varied; the most common were respiratory inflammatory diseases (n = 15). Twenty-two patients died due to the progression of an underlying disease such as malignancy. More than half of patients died due to deterioration of their general conditions in relation to complications such as pneumonia. The mean serum albumin levels at the start of intervention were 2.3±0.5g/dl for those who died and 2.8±0.6g/dl for the 70 patients who achieved sufficient oral intake after the start of intervention, showing a statistically significant difference (p < 0.01). Among those who died, 7 patients achieved some degree of oral intake, at least temporarily, but most continued to suffer from malnutrition even after the intervention. [Conclusions] The results of the present study showed that most mortalities were attributable to deterioration of general condition including nutritional status rather than to fatal diseases such as malignancy and severe stroke. The dysphagic patients who died in hospital had been suffering from malnutrition throughout the hospitalization, suggesting the importance of nutritional intervention.

PHR.4 NUTRITIONAL STATUS IN STROKE PATIENT IN REHABILITATION WARD

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Introduction: The patients who have had stroke have difficulty in activity of daily livings including eating. Some patients have the swallowing problem. This may lead to poor nutrition and pulmonary infection. The nutritional status has an effect on the outcome of the rehabilitation and length of hospital stay. Therefore, nutritional status evaluation and intervention to improve nutrition is important. The objective of this study was to determine the nutritional status of stroke patient who admitted in rehabilitation ward. Material & Methods: All stroke patients who admitted at rehabilitation ward, Srinagarind hospital, in 2014 were recruited in the study. All participants were assessed the nutritional status using Srinagarind nutritional screening tool within 48 hour after admission. Results: A total of 97 stroke patients, with mean age 65.13 +/- 10.22 years, were screened. Of these patients, 87% had been reported in risk group thus 57% were defined as high risk for malnutrition which needed intervention to improve nutrition. Most of the patients (73%) had the swallowing problem. About half reported poor appetite and weight loss. Thirty percent of these patients had low Body mass index (less than 18 kg/m2). Conclusions: Stroke patients had a high risk for malnutrition, therefore nutritional status assessment and nutritional care plan should be developed for such patients.

PHR.5 LONG-TERM COMPLICATIONS RELATED TO SEVERE NEUROGENIC DYSPHAGIA IN ACQUIRED BRAIN INJURY PATIENTS

A. Morales Mateu; R. Terré; M. Bernabeu; F. Mearin / 1Institut Guttmann, Spain

Introduction: The aim of the present study was to analyze long term complications of patients with severe neurogenic dysphagia (score ≤ 3 in FOS scale). Material and methods: We retrospectively studied 15 hospitalized patients with acquired brain injury at least with 5 years of follow-up from 2002 to 2008 who were admitted to hospital for neu-
few studies addressed the sensory quality and acceptability of thickened food and thickeners in dysphagia from different perspectives. The aim of the study was to explore the perceptions, needs and interests related to food and thickeners in dysphagia patients, professionals and caregivers.

PPH.6 PERCEPTIONS, NEEDS AND INTERESTS RELATED TO FOOD AND THICKENERS IN DYSPHAGIA: PATIENTS, PROFESSIONALS AND CAREGIVERS PERSPECTIVE
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Introduction Modifying the consistency of liquids is a solution for the safe feeding of dysphagia patients. The adding thickeners in liquids have devastating effects on the sensory quality of the product leading to rejection of food with the risk of dehydration and undernutrition. However, few studies addressed the sensory quality and acceptability of thickened liquids and provide information to improve satisfaction of patients. Therefore, it's necessary to find strategies to improve the knowledge about the disease and to train about the anti-dysphagia measures related to the dietary treatment, not only for the professionals but also for the caregivers and patients.

PPH.7 ENT CAUSES FOR DYSPHAGIA IN CHILDREN - TWO CASE REPORTS
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Background Dysphagia can threaten normal child’s development. The main concern is mortality due to aspiration pneumonia, dehydration and malnutrition. Dysphagia should be suspected in children in whom food spitting, prolonged feeding, coughing or choking during feeding, and continuous drooling or repeated respiratory symptoms are present. Neurological and inborn diseases are the main reasons for dysphagia in children. The fiberoptic endoscopic evaluation of swallowing can reveal the cause of dysphagia and direct the interdisciplinary treatment. The conservative rehabilitation procedures including different head and body positions, food textures, and swallowing maneuvers are oriented toward specific child’s symptom. In some cases the speech therapist’s treatment is not sufficient and surgical treatment is necessary. Case 1.: two months old premature boy was referred to the Phoniatric office because of coughing during bottle feeding. After birth the nasogastric tube insertion and nasotracheal intubation was necessary because of tracheoesophageal fistula. After surgical treatment of fistula oral feeding was attempted. The fiberoptic nasolaryngoscopy showed slightly impaired mobility of the left vocal fold probably caused by the injury of the left laryngeal recurrent nerve during surgical procedure. Feeding with the right side of the head in a lower position than his left side was advised. The coughing during bottle feeding disappeared completely. Case 2.: six months old girl was referred to the Phoniatric office because of increasing feeding problems due to inability of nose breathing. Choanal atresia was suspected. Nasolaryngoscopy showed large adenoids, which completely filled nasopharynx and choanae. The coagulation adenoidectomy was performed under endoscopic control. After the operation, child was able to breathe through her nose and was breastfed without difficulties. Conclusions. Dysphagia in children is not rare. The causes for dysphagia can be also found in the ENT region. Endoscopic examination of the upper aerodigestive tract can explain the problems in a considerable number of cases and proper conservative or surgical treatment can be started.

PPH.8 PRENATAL AND NEONATAL COUNSELING IN CASES OF DYSPHAGIA CAUSED BY CLEFT LIP AND/OR PALATE: ROLE OF SPEECH AND LANGUAGE THERAPIST
H. Pimental
School of Allied Health Technologies - Polytechnic Institute of Porto, Portugal

The feeding process involves complex functions that can be disturbed by Cleft Lip and/or Palate (CPL), causing dysphagia. The diagnosis of CPL can begin throughout the prenatal period, from the second trimester...
of pregnancy, or in neonatal period. According to specialists Robbins et al. (2010) and Rey-Bellet et al. (2004), usually, this diagnosis has a significant impact on the family. These families essentially seek to find answers to their questions about the feeding technics and/or strategies. Speech and Language Therapist (SLT) has an important role in the follow-up of those families, supporting the feeding process and minimizing the consequences of dysphagia. This accompanying can be conducted in pre- or neonatal period. Therefore, we will be looking to identify, characterize and describe the role of this professional in the pre and neonatal feeding counseling, provided to caregivers of babies with CLP. To achieve the outlined objectives it was developed a narrative review, with a selection and analysis of published articles, between 2000 and 2015, based on reference authors such as C. Rey-Bellet, E. Altmann, L. Flasher, P. Fogle, J. Hohlfeld, J. Robbins or R. Strauss. The results indicated that prenatal diagnosis enables a more effective preparation for neonatal baby needs in feeding process. According to these research, this area stands out as that which is most needed for prospective parents. These become more capable at feeding their children (by breastfeeding and/or with assisted feeding). The satisfaction of families with this counseling reaches more capable at feeding their children (by breastfeeding and/or with assisted feeding). The satisfaction of families with this counseling reaches.

PPH.9 FEES FINDINGS IN CHILDREN WITH RETT SYNDROME
A.D. Delidis1; E. Georganitis2; N. Papadimitriou3; I. Plioutas4; T. Nikolopoulos5; 2nd Otolaryngology Department, University of Athens Medical School, Greece; 3rd Otolaryngology Department, University of Athens Medical School, “Attikon” University Hospital, A, Greece; 2nd Otolaryngology Department, University of Athens Medical School, “Attikon” University Hospital, A, Greece

Introduction: Rett Syndrome is a rare neurodevelopmental disorder with a known chromosomal abnormality that causes severe pervasive neurological impairment. Originally termed cerebroatrophic hyperammonemia, it is a neurological disorder of the grey matter of the brain that almost exclusively affects females but has also been found in male patients. The clinical features include small hands and feet and a deceleration of the head growth (including microcephaly in some). Repetitive stereotyped hand movements, such as wringing and/or repeatedly putting hands into the mouth, are also noted. People with Rett syndrome are prone to gastrointestinal disorders and up to 80% have seizures. They typically have no verbal skills, and about 50% of affected individuals do not walk. Scoliosis, growth failure, and constipation are very common and can be problematic. Dysphagia is common in this population. Materials/Methods Six patients with diagnosed Rett Syndrome were examined in the Voice and Swallowing disorders clinic of the “Attikon” University Hospital, Athens, Greece and underwent Fiberoptic Endoscopic Examination of Swallowing (FEES). A pediatric fiberoptic endoscope (Carl Storz®) was used. Pureed bolus and liquid bolus were delivered and penetration/aspiration scale noted. Examinations were recorded and reviewed by at least two physicians. Medical history, including prior pneumonia episodes were also noted. Results All subjects concluded the examination. Mean age was 7.5 years. All patients were female. Patients less than 7 years old had no prior history of pneumonias whereas older patients (two) had multiple episodes of pulmonary infections. Penetration/ aspiration scale had a mean value of 3.7 with no patients aspirating and two having normal pharyngeal phases. All had oral apraxia and were receiving pureed oral diet. None had gastrostomy. Conclusion FEES is an acceptable and valuable method for evaluating swallowing efficacy of this rare population of patients.

SATURDAY OCTOBER 03
15:30 – 16:00 Exhibition Hall Session 15J Poster viewing, Screening and clinical assessment 2

PPJ.1 DOES DIURNAL VARIATION IN COUGH REFLEX TESTING EXIST IN HEALTHY YOUNG ADULTS?
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Introduction: Cough reflex testing (CRT) is increasingly utilised in dysphagia research and clinical practice as a means of assessing reflexive cough sensitivity and silent aspiration risk. Diurnal variation in cough sensitivity may be a major confounding variable (Pounsford et al, 1985) that is controlled for in clinical trials by testing at the same time each day. However, this may not be feasible in acute clinical settings. In addition, diurnal variation has only been described in CRT using a vital-capacity method. It is unknown whether such variation exists in the tidal-breathing method, more commonly used in clinical assessment. We present findings from an investigation of diurnal variability in CRT in healthy young adults using a tidal-breathing method. Material & Methods: 53 participants (19 --37 years) underwent CRT on two occasions: once in the morning (between 9am -- midday) and once in the afternoon (between 2 -- 5pm). The order of testing was randomised. Participants inhaled successively higher citric acid concentrations via a facemask, with saline solution randomly interspersed to control for a placebo response. The lowest concentration that elicited a reflexive cough response was recorded. Results: Morning cough thresholds (Mdn = 0.4 mol/L) were not significantly different from afternoon cough thresholds (Mdn = 0.4 mol/L), p > .05, T = 11, r = -.14. Regardless of time of day, participants’ first cough thresholds (Mdn = 0.3 mol/L) were significantly lower than their second cough thresholds (Mdn = 0.4 mol/L), p < .01, T = 6, r = 0.27. Conclusions: We found no evidence of diurnal variability in CRT. Inter-day variation was observed, however this was no greater than one dose above initial thresholds. This raises the question of reproducibility of CRT in patient populations; an issue which warrants further investigation.

PPJ.2 VALIDITY EVIDENCE BASED ON CONTENT VALIDITY AND RESPONSE PROCESSES OF A MULTIDISCIPLINARY SCREENING TOOL FOR OROPHARYNGEAL DYSPHAGIA IN STROKE
T.M. Almeida1; P.C. Cola2; H. Magalhães3; D. Magnoni2; L. Pernambuco4; R.G. Silva5; Dante Pazzanese Institute, Brazil; 4UNESP, Brazil; 5UFPR, Brazil

Introduction: a multidisciplinary screening tool which provides valid and reliable interpretation of the results is crucial to the early identification
PPJ.3 TRANSCULTURAL TRANSLATION OF “EATING ASSESSMENT TOOL” TO PORTUGUESE LANGUAGE FROM ANGOLA
S. Leal; R.G. Silva; S. Mestre; A. Rockland

Purpose: Perform and validate a transcultural translation of the Eating Assessment Tool (EAT-10) to the Portuguese language of Angola-Africa.

Methods: The translation process was divided into four interconnected steps: Translation - conducted by a committee of three independent translators whose native language is Portuguese from Angola and full English proficiency; Back-translation-performed by a Portuguese/English bilingual translator with cultural experience in both Angola and USA; Expert panel-the translated versions and the back-translated version were compared and analysed by an expert panel of six dysphagia experienced speech therapy professionals; Content validation-preliminary version was compiled with guidelines from the expert panel which was then applied to a sample of 37 subjects from the Luanda province, from both genders, at least 18 years old and with no signs of deglutition problems, intellectual disability, dementia, hearing loss and/or visual loss that would jeopardize the acknowledgment of the information given prior to the test and the ability to fill a form. Results: Semantical and content equivalence was reached. Consensus regarding the pre-final version of the document was also fulfilled. The experts agreed with the majority of the translated items within a range of 83.3% to 100% on the translated items. The content validation phase showed that 91.9% of the subjects considered the questions easy to understand and to answer while 89.2% of the subjects considered the instructions to be clear. The level of education does not seem to directly influence the intelligibility of the instrument items, not understanding the words of the same, observing a proportional distribution between the groups with lower education and the group of higher qualifications. Conclusion: The EAT-10 was successfully translated and adapted to the Angolan culture therefore creating the EAT-10 version for Angolan Portuguese: A Tool for Screening Swallowing.

PPJ.4 THE LEBANESE ARABIC VERSION OF THE EATING ASSESSMENT TOOL (LEBEAT-10)
S. Leal; R.G. Silva; S. Mestre; A. Rockland

Purpose: Perform and validate a transcultural translation of the Eating Assessment Tool (EAT-10) to the Lebanese language of Lebanon.

Methods: The translation process was divided into three phases. Phase 1) items development based on an extensive literature review on MEDLINE, EMBASE, LILACS, SciELO and Cochrane Library databases; Phase 2) analysis of a multidisciplinary committee of 19 judges. Content Validity Index values (IVC) above 0.78 were accepted to determine the acceptance of the judge’s analysis; Phase 3) investigation of validity evidence based on professional health responses. They administered the tool and answered a structured interview and cognitive scale about their understanding of the items and possible issues during administration. After adjustments, the final version of this phase was developed. Results: Phase I) after the literature review, the tool were developed and divided into Step I with 18 questions related to predictive risk factors for OD and Step II with 11 questions related to indicative signs of risk for OD observed during homogeneous soft diet meal; Phase 2) eight items of the Step I and four items of the Step II have not reached the IVC baseline after the analysis of the judges. The authors reviewed the items and a second version of the tool was developed. Phase 3) cognitive interview revealed misconceptions by some health professionals. New adjustments by the authors resulted in the final version of the tool, produced for future analysis of the other psychometric properties. Conclusions: It was possible to develop a multidisciplinary screening tool for dysphagia in stroke with validity evidence based on test content and response process.
swallowing requires good oral mobility and strength. Movements and actions in one swallowing phase influence movements and actions in the others. The lack of saliva, which is generally underestimated, makes swallowing difficult by interfering with bolus manipulation and movement within the mouth, pharynx and esophagus. Xerostomia, a clinical symptom defined as dryness of the oral mucosa, can in this context lessen the ability to sense the bolus (swallow is triggered by the sensation of the bolus in the pharynx), and causes impairment of oral functions (reduced ability to chew and decreased bolus propulsion). Xerostomia’s signs and symptoms may include: burning sensation in the mouth, poor oral hygiene, inflammatory change of oral mucosa, taste dysfunction (dyseusia), high incidence of periodontal disease or caries, changes in oral sensitivity and painful swallowing (odynophagia). Due to the decreased production of saliva, xerostomia can potentially lead to difficulty in swallowing which can lead to limited motivation to eat, poor swallowing initiation and limited intake volume (poor oral intake). The aim of this report is to describe swallow function impairment secondary to dry mouth symptoms in order to describe the bases for the differential diagnosis of secondary dysphagia versus swallowing discomfort, and to establish a protocol to manage these patients with speech therapy.

**PPJ.6 DEVELOPMENT OF THE TURKISH VERSION OF THE DYSPHAGIA HANDICAP INDEX (DHI-T)**

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The Dysphagia Handicap Index (DHI) developed by Silberg et al (2011) is a self-administered 25-item questionnaire. Since it is non-invasive, it is easy to administer and has an impact on person’s quality of live. The purpose of this study was to develop a Turkish version of the DHI (DHI-T). Fallowing development of the device, to assess its validity, reliability in the normal and people with acquired neurologically based oropharyngeal dysphagia. This study was conducted at the University based hospital of the Health Sciences Faculty. The questionnaire is translated into Turkish, and then re-translated into English by 5 fluent speakers. Later is administered to 200 people with dysphagia diagnosis secondary to stroke, and 150-control group. Internal consistency and test-retest reliability were evaluated. The results of two groups were compared statistically. DHI-T Cronbach’s alpha coefficient score = 0.96 indicating good internal consistency of the questionnaire. 35% of the people in the study completed the re-test for reliability, which was found for the total scores of DHI-T (r=0.87, p=0.0001). There was also a significant difference between two groups in the study (p<0.001). A scale of self-reported severity at the bottom of the scale was also related to the scale itself. It was a good way of looking into problems origin being “physical”, “emotional” or “functional” to determine management plan. Post therapy scores were also compared with the baseline scores. Detailed statistics will be provided.

**PPJ.7 THE TOMASS: A CROSS-COUNTRY COMPARISON OF NORMATIVE DATA NEW ZEALAND AND PORTUGAL**

D. Nogueira1; M. Huckabee2; E. Reis3; M. Filipe4; C. Ribeiro5; A.M. Campos6; R. Vieira7; Z. Raposo8; N. Silva8; I. Mestre9; D. Silva1; S. Veloso1/
1Escola Superior de Saúde do Alcoitão, Portugal; 2The University of Canterbury, New Zealand; 3Lisbon University Institute, Portugal; 4Escola Superior de Saúde do Alcoitão, Portugal; 5Escola Superior de Saúde do Alcoitão, Portugal; 6Escola Superior de Saúde do Alcoitão, Portugal; 7Escola Superior de saúde do Alcoitão, Qatar; 8escola Superior de saúde do Alcoitão, Portugal

Introduction: The clinical evaluation of swallowing comprises a collection of non-instrumental measures, which may include and swallows of liquids and solids. Those assessments consist primarily of subjective interpretation of that is largely dependent on observation, experience and the type protocols used and the process as well. Few objective measures with comparisons to normative data were found so far. The Timed Test of Swallowing (1996, Hughes & Wiles ) document the swallow of 150 ml of water in healthy individuals. The TOMASS, developed over the last few years by McIntosh et al tests the efficiency for solid bolus intake: Material and Methods: The present study was conducted in the test application to a sample of 121 healthy Portuguese individuals. Results:The results of the cross cultural comparison were similar to those previously found with healthy controls. Differences may be influenced by the type of cracker, cultural type of food and other reasons that make normative data by country absolutely necessary. Conclusions: TOMASS is an easy administration test that shows great similarities between countries when testing healthy controls. However, the cracker type can influence results. Great similarities were found that will permit compare results with specific population with dysphagia and use this test as a routine practice test as well.
Abstract Book

PPJ.9 RELATIONSHIP BETWEEN THE FLEXOR NECK MUSCLE ENDURANCE, PHONATION TIME AND PEAK EXPIRATORY FLOW RATE IN YOUNGER PEOPLE
C. Sayaca1; H.E. Kilinc2; N. Demir2; N.A. Sayaca2; A. Karaduman3/
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Purpose: In the clinic, shaker and phonation exercises are most commonly used to strengthen movements of larynx. In addition, coughing is important to eject the foreign body from trachea after aspiration. Peak expiratory flow rate is strongly related to coughing. We aimed to investigate the correlation between the flexor neck muscles endurance, phonation time and peak expiratory flow rate (PEF), statistically.

Materials and Methods: The participant lay supine, with the head lifted nearly two finger above bed and keeping this position for a long time to evaluate the neck flexor muscle endurance. For phonation time, individual said /i/ very strongly and for a long time after deep inspiration and time was recorded. Finally, peak expiratory flow rate was measured by a Mini Wright Peak flowmeter. We calculated that we would need 41 participants to detect a two point difference with 80% power and at 5% significance and correlation was minimum 0.5 between dependent parameters. In addition we added 10% participants to cover potential problem. Result: Sixty-one individuals were accepted in this study (31 female and 30 male). Mean age was 20.7 (19 to 25). Mean neck flexor muscle endurance was 61.36 sec, mean phonation time was 20.16 sec, and mean PEF was 466.93 l/min. Four individuals did not want to puff a Mini Wright Peak flowmeter. Statistically, there were significant relationships between neck flexor muscle endurance and phonation time (r:0.43, p<0.01), between neck flexor muscle endurance and PEF (r:0.47, p<0.001), and between PEF and phonation time (r:0.42, p<0.01).

Discussion: There are significant relationships between phonation time, flexor neck muscle exercises and PEF. Patients with problems during deglutition are given an exercise programme that includes improving phonation and flexor muscle endurance and a tough expiratory exercise. We think that in this way we can increase effectiveness of rehabilitation.

PPJ.10 VALIDATION OF THE TEST OF MASTICATION AND SWALLOWING OF SOLIDS (TOMASS) IN HEALTHY IRISH ADULTS
E. McCague; M. Walshe; O. Kerrigan; Trinity College Dublin, Ireland

Introduction: There are few assessments available for evaluating mastication. The Test of Mastication and Swallowing of Solids (TOMASS) has been validated in New Zealand (NZ) using the Arnott’s Salada™ cracker. In order for TOMASS to be used in Ireland and UK, it needs validation in healthy Irish adults using a locally available cracker. This study aims to establish normative values for the TOMASS in Irish adults and seek an alternative cracker for Irish and UK populations. Materials and Methods: 55 participants were recruited. These covered 4 age groups: 18-40 years; 41-60 years; 61-80 years; 81 years+. Norms for age and gender for each of the participant groups were calculated. Differences between norms on both types of crackers were investigated. Results: Normative values were established for Irish adults using Arnott’s Salada™ cracker. There were no differences were found between the Irish and NZ populations with the exception of the number of swallows per cracker in men. The TOMASS demonstrated high inter and intra-rater reliability. There were significant differences between both cracker types in terms of age, gender, time taken to ingest cracker and number of masticatory cycles per bolus. Conclusion: Norms achieved in the Irish population largely support NZ data. Carr’s Table Water™ cracker is not a suitable replacement for Arnott’s Salada™ cracker due to statistically significant differences across parameters. Options for further development of data with an Irish-UK cracker equivalent are discussed.

15:30 - 16:00
Session 15K Poster viewing, Instrumental Assessment
Exhibition Hall

PPK.1 TOWARDS STANDARDIZED MULTIDIMENSIONAL SWALLOWING ASSESSMENT IN DAILY CLINICAL PRACTICE
L. Baijens; W. Pilz; H. Moes; N. Roodeberg; Maastricht University Medical Center, Netherlands

Introduction. Standardized protocols for examinations such as videofluoroscopy and fiberoptic endoscopic evaluation of swallowing are widely applied in the context of scientific dysphagia research. In daily clinical practice, however, the same examinations are often performed without a standardized protocol.
The Barthel Index has been shown to be a good measure of disability validated tools, if available. For examining the patient or for interpreting the results. Furthermore, aspects of patient well-being such as affective disorders, cognitive function, and dysphagia-related quality of life are not usually measured and thus not taken into account in dysphagia treatment planning. Material and Methods: Patients visiting the outpatient clinic for dysphagia at the Maastricht University Medical Center undergo a multidisciplinary and multidimensional swallowing assessment with a duration of under two hours. Results: Table 1 shows the standardized multidimensional protocol for swallowing assessment used in Maastricht. Conclusions: Some evaluation procedures only address a single aspect of swallowing, resulting in specific information that could be complemented by performing a multidimensional swallowing assessment with different evaluation tools. So doing would give a bigger picture of a patient’s pathophysiology of swallowing and thus assist in decision-making for treatment in daily clinical practice. Furthermore, information derived on clinically relevant affective symptoms, cognitive function, and dysphagia-related quality of life could play a role in dysphagia management. The protocol we apply in Maastricht is not one of the gold standards; instead, by capturing multiple aspects of patient well-being such as affective disorders, cognitive function, and dysphagia-related quality of life, it can be helpful in designing a customized treatment plan. This presentation demonstrates the benefits of applying a standardized multidimensional swallowing assessment protocol using validated tools, if available.

PPK.2 EARLY DETECTION AND REHABILITATION OF SWALLOWING DISORDERS
L. Bubbico/Italian Institute of Social Medicine / ISFOL, Italy
The Barthel Index has been shown to be a good measure of disability and is applied in routine clinical practice in a valid and reliable manner. In the patients with stroke, the swallowing disorders and severe communication deficits affect much on the degree of disability. The evaluation of Barthel score can permit differentiation of patients according to severity and valuate the improvement in swallowing rehabilitation. Forty-eight consecutive stroke patients, 34 ischemic and 14 hemorrhagic, 26 male and 22 female, with mean age 74.4 years (from 36 to 89), were included. A complete swallowing evaluation, including bed side examination, water test, pharyngeal sensation and fiberoptic endoscopic evaluation of swallowing (FEES), was performed. The aim of this study was to provide data on the effects of swallowing therapy on stroke patients and to evaluate the influence of disability on the dysphagia evolution. Moreover the functional severity of dysphagia was assessed by The Dysphagia Outcome and Severity Scale (DOSS). For disability assessment we used Barthel Index. The dysphagia and disability evaluation was conducted on admission and on discharge, after about 8 weeks (mean: 61.6 days) of neurological and swallowing rehabilitation. Thirty-eight stroke patients (80% of the cases) presented dysphagia: 18 (47%) moderate dysphagia, and 15 (39%) severe dysphagia. On discharge, 18 patients (47.3%) recovered normal swallowing, 9 patients (23.6%) had physiologic swallowing with an adequate oral diet restriction, and 6 were nourished through SNG or PEG. The comparison between the patients with improvement of dysphagia after swallowing therapy and the patients with persistent severe dysphagia on admission, showed a significantly lower Barthel Index score in the latter group (p=0.001). This study sustains the usefulness of a complete swallowing evaluation (bed side examination, water test, pharyngeal sensation, FEES and DOSS) to evaluate the occurrence and evolution.

PPK.3 CLASSIFICATION OF THE SEVERITY OF OROPHARYNGEAL SWALLOWING IN THE HEALTHY ELDERLY
T. Totta1; C.T. Mituuti2; G. Berretin-Felix3/1Hospital for Rehabilitation of Craniofacial Anomalies - University of São Paulo, Brazil; 2 Federal University of Santa Catarina, Brazil; 3Bauru Dental School - University of São Paulo, Brazil
Purpose: The purpose of this study was to propose a clinical protocol to classify the severity of oropharyngeal swallowing dysfunction in the elderly. Material and Methods: We evaluated 37 healthy elderly people, from both genders by the clinical evaluation of swallowing comparing with the functional endoscopy evaluation of swallowing (FEES). The clinical and FEES evaluation was performed by two blinded experienced speech language pathologists in order to verify the swallowing performance when tested the solid, pudding and liquid consistencies. The individuals were classified according to the severity of oropharyngeal swallowing dysfunction in the clinical evaluation and in the FEES. Results: The results indicate significant differences between clinical evaluation and FEES to severity of oropharyngeal swallowing dysfunction to the consistencies of liquid (0.0098), pudding (0.0014) and solid (0.0006). The proposed protocol presented the following values of sensibility: liquid = 50%, pudding = 100%, solid = 66%; Specificity: liquid = 61%, pudding = 66%, solid = 53%; Negative predictive values: liquid = 91%, pudding = 100%, solid = 94%; Positive predictive values: liquid = 13%, pudding = 14%, solid = 11%. Conclusion: The protocol didn’t classify the severity of oropharyngeal swallowing dysfunction, however identified the suggestive signs of absence of penetration and aspiration for pudding, confirmed by FEES; it overestimated the identification of these signs when compared with FEES for the other tested consistencies.
related factors were investigated. Material & Methods Subjects were 12 healthy adults (7 males and 5 females: 28.1±6.7 years on average). A 4-ch stealth pharyngeal pressure measurement device (8 Fr in diameter) (Star Medical) was used to measure the swallowing pressure. The most caudal part of the sensor was set at ch 4, and the swallowing pressure was measured at 4 points with 2-cm increments. A sensor catheter was inserted nasally. After ch 4 had reached a positive resting pressure, and the wave form had become stable, 5 mL of tap water at room temperature was given to swallow without command. The grip strength and tongue pressure were simultaneously measured to evaluate the relationship with the swallowing pressure. Results: The mean swallowing pressure was 120.4±26.2 mmHg in males and 177.8±57.4 mmHg in females at ch 1 in the tongue root, suggesting a significant difference between males and females, but no significant difference was observed in the other ch. The swallowing pressure was significantly lower at ch 2 compared with the other ch. No correlation was observed between the swallowing pressure and grip strength in the healthy subjects.

**PPK.5 A PHYSICAL MODEL FOR STUDYING FLUID RHEOLOGY DURING A SIMULATED ORAL SWALLOW**

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Introduction: Thickened drinks can be easier to swallow for dysphagia patients, but the rheological properties responsible for this are not fully understood. Classifying thickened drinks using a rheometer is too dissimilar to the physiological swallowing environment and in vivo measurement methods have limited accuracy and are cumbersome. A physical model can expose thickened drinks to the same physiological and mechanical conditions they would experience during a real swallow and allows detailed, novel and repeatable rheological measurements to be made. The parameters to be investigated are tongue – hard palate contact pattern, as it moves upward. It has an elastic modulus of 125 kPa and base sagittal dimensions 70 x 60 mm2. It is sloped in order to replicate a typical tongue – hard palate contact pattern. The angle of this slope determines the swallowing pressure and range of pressures will be tested: 3, 6.75, 12.5, 24.25 and 36 kPa. These values were determined by an extensive literature review of studies that measured healthy swallow pressures. The tongue surface is microscopically textured and lubricated in order to match the surface tribology of the human tongue. Total oral swallow time can be finely adjusted and the range 0.25 – 3 s will be investigated. Particle image velocimetry will be used to measure internal bolus rheology by analysis of two-dimensional fluid vector images. Results / Conclusions: Preliminary results demonstrate a relationship between oral swallow time and fluid flow characteristics in the sagittal plane. With greater knowledge of fluid behaviour under healthy and dysphagic swallowing conditions, current treatments for dysphagia can be better understood and improved to achieve safer swallowing.

**PPK.6 ASSESSMENT OF PHARYNGEAL RESIDUE USING RETRO-NASAL AROMA**

K. Horii1; S. Fujiwara2; M. Inoue3; T. Ono4/ 1Division of Comprehensive Prosthodontics, Niigata university graduate school of medical and dental s, Japan; 2Division of Dysphagia Rehabilitation, Niigata university graduate school of medical and dental science, Japan

Introduction: Pharyngeal residue after swallowing may be due to weak pharyngeal pressure, dyscoordination of swallow-related muscle activity or impairment of upper esophagus sphincter opening. Though pharyngeal residue can be detected by videofluorographic or videoendoscopic assessment, methodology of its quantitative evaluation has not yet been established. Retro-nasal aroma is defined as the sensory perception of aroma via velo-pharynx. In the present study, we test the hypothesis that pharyngeal residue can be quantified by measurement of retro-nasal aroma. Material & Methods: Five healthy young volunteers participated. The intensity of retro-nasal aroma was measured via nasal tube from naris using odor sensor. Since the simulation of pharyngeal residue, after small amount of flavor essence (0.2, 0.4 and 0.6 ml) was injected to the hypopharynx via tube of 1 mm outer diameter, the subject was asked to hold it. The intensity of retro-nasal aroma was measured every one second and compared with the amount of the flavor essence. Results: The intensity of retro-nasal aroma was increased gradually and reached plateau 60 second after injection. The changes in the intensity of retro-nasal aroma were affected by respiration. Furthermore, the intensity of retro-nasal aroma had a significant liner correlation with the amount of the flavor essence (P<0.01, R=0.979, Peason’s correlation). Conclusions: Our current results suggested that measurement of retro-nasal aroma can possibly be available to measure the pharyngeal residue noninvasively.

**PPK.7 CLINICAL Efficacy IN PATIENTS WITH MECHANICAL VENTilation**

R.O. Castaño Perez/ Hospital Universitario Austral, Argentina

Introduction. Dysphagia is the outcome of a variety of acute or chronic illnesses, or medical procedures such as mechanical ventilation. Several authors agree on the incidence of dysphagia after mechanical ventilation, some reviews also found higher incidence of dysphagia studied with onsite instrumentation showing up to 82% of problems concerning the larynx. Others studies suggested laryngo-pharyngeal incompetence after recent extubation. Material & Methods. We studied 18 patients in 2 groups who required orotracheal intubation and mechanical ventilation for more than 48 hours in the Intensive Care Unit Service. We excluded patients with history of dysphagia, head and neck surgery and tracheostomies. Group 1 (9 patients): evaluated by clinical method of volume-viscosity swallow test (V-VST). Group 2 (7 patients):
PPK.8 FEES IN EXTUBATED ICU PATIENTS WITH DYSPHAGIA: SALIVA AND PUREE SWALLOWING RELATIONSHIP?

J. Prada-Pendolero; E. Fernández-Bermejo; M.J. Aroca; F. Monasterio/ La Princesa University Hospital, Madrid, Spain, Spain

Introduction: Fiberoptic endoscopic evaluation of swallowing (FEES) is gold standard for deglutition study in the ICU setting. Objectives: Analysys of Protocol FEES results. Methods and main results: Prospective observational randomized study, >24-48h consecutive patients in a 26-bed general ICU University Hospital. 35 adults patients underwent serial FEES, first one was included. Each patient was studied for saliva and meal consistencies. 28/35 (80%) patients had tracheostomy cannula. 94.6% of FEES were made on day 2-6. Only 13/20 (37.1%) patients did not aspirated at least two food consistencies. Statistical difference Puding and saliva were demonstrated. Conclusion: Aspiration of saliva and stasis of puree are main independent complaints of post-IOT dysphagia (p<0.05)

PPK.9 TRANSNASAL ENDOSCOPY OF THE ORAL-CAVITY’S FUNCTION: TECHNIQUE AND LIFE-DEMONSTRATION

I.F.H. Herrmann/ Interdisciplinary Reflux-Center, Germany

Introduction: Transnasal endoscopy of the oral cavity is the basis for understanding normal oropharyngeal functioning and dysphagia. Material & Methods: In our trial, we performed a retroflexion of the endoscope in the oropharynx up to 180° - 200°. The optical window was placed at the border between the soft and hard palate. Different qualities of food and liquid were applied. Neither sedation nor local-anesthesia were used. Results: The endoscopic analysis of the oral cavity’s function is an innovative approach. After gathering sufficient experiences, we started with the endoscopy of patients with dysphagia problems. Independent of speech and voice production, biting off and crushing of food of different consistencies as well as soaking and softening, is considered to be the main task of the oral cavity. The tongue directs the interaction between lips, cheek, teeth and saliva during oral digestion. Together with the soft palate it organizes the transport to the oropharynx. Conclusions: The collaboration between the tongue, the teeth, the cheeks and the saliva-injection can be observed in detail. The findings modify the understanding of the function and dys-function of the tongue and of the soft palate.

PPK.10 TRANSNASAL ENDOSCOPY OF THE OROPHARYNGEAL FUNCTION (RETFLEXED VIEW)

C. Arens/ ENT-Department, Univ. Magdeburg, Germany

Introduction: During the transport of the intake through the oropharyngeal tract, depending on the consistency of food (solid versus liquid) a laryngeal cascade may be observed. The aim of the study was to visualize this process endoscopically. Material & Methods: In our trial, we used the transnasal access and performed a retroflexion of the endoscope in the oropharynx up to 180° - 200°. After gathering sufficient experience by self-experiments, we examined patients suffering from dysphagia. The retroflexed optical window was placed at the tip of the epiglottis. Different qualities of food and liquid were tested. Neither sedation nor local anesthesia was used. The video-sequences were analyzed with the help of slow motion and time measurements. The registration was performed in HD-Quality. Results: The retroflexed endoscopic analysis of the oropharyngeal function had previously not been described. This innovative technology notably improves the quality of the data and the precision of diagnosis. New aspects of the oropharyngeal function were discovered: e.g. bolus collection at the tongue base and in the valleculae; the flow fl ows over the plicae pharyngoepiglotticae and triggers the swallowing act. Conclusions: Oropharyngeal endoscopy with antero- and retroflexed views provides insight into the complexity of the oropharyngeal function. The technical improvements permit a better understanding of the complexity of the process and of the etiology of dysfunctions, stimulating the development of new treatment strategies.
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honey was 2.89 swallows and pudding was 2.33 swallows. There was a correlation between the variables penetration and aspiration and early escape later and beginning of the pharyngeal phase consistency nectar. Conclusion: There was a change in temporal and perceptual visual swallowing parameters in patients with bronchiectasis, even with the presence of penetration and aspiration.

PPL.2 REDUCED TONGUE STRENGTH DOES NOT AFFECT SENSORY TESTS OF TACTILE OR VISCOSITY DISCRIMINATION
C.E.A. Barbon1; V. Chak4; R. Cliffe Polacco1; S. Hori1; S.M. Molfenter2; M. Peladeau–Pigeon1; T. Shariff2; S. Stokely2; T.J. Valenzano1; C. Yee1; C.M. Steele1/4 Toronto Rehabilitation Institute, Canada; 1New York University, United States
Introduction It is plausible to assume that sensory information obtained during bolus compression by the tongue enables tailoring of propulsion forces to bolus viscosity. We explored whether reduced tongue strength leads to higher sensory discrimination thresholds in healthy adults and adults with dysphagia. Materials & Methods Two experiments were conducted. Experiment 1 involved 340 healthy individuals aged 12-86 (178 women). Experiment 2 involved 19 adults with neurogenic dysphagia aged 33-86 (10 women). Maximum isometric tongue pressures were measured using the Iowa Oral Performance Instrument. Participants also completed the Essick Tactile Discrimination Acuity Test, which identifies the threshold (in mm) of correct identification of embossed alphabet letters probed by the tongue while blindfolded. Finally, participants completed a triangle test viscosity discrimination task using 5 xanthan-gum thickened liquids ranging from 190-380 mPa.s @50s⁻¹. Experiment 1 analyses explored differences in tactile and viscosity discrimination as a function of age (in 20-year bins), sex and tongue strength. Paired t-tests were used to compare individuals with dysphagia do not have greater difficulty discriminating viscosity with xanthan-gum thickened liquids. This suggests that individuals with reduced tongue strength should still be able to detect and respond to differences in bolus viscosity.

PPL.3 SWALLOWING PHYSIOLOGY AFTER CERVICAL SPINE SURGERY
S. Duchac1; M. Hielscher-Fastabend4; H.M. Müller2; T. Pitzen1/4 Klinikum Karlsbad, Germany; 4University of Bielefeld, Germany
Introduction: Dysphagia with an incidence of up to 79% is the most common complication after cervical spine surgery. Whilst most cases seem to be temporary and slight, there are severe and complex cases, where patients suffer immensely. However, there are hardly any studies looking at components of swallowing physiology additional to penetration/aspiration and Residue Scores. The aim of this study is to investigate if there are significant changes in swallowing physiology in this patient population. Methods: In 28 patients (13f/15m; age M = 58,2, SD = 17,1) who underwent cervical spine surgery (anterior approach n = 19, posterior approach n = 9) Videofluoroscopy was done one day before surgery and after surgery (M = 4 days, range 1-15 days). Videofluoroscopy data were analysed retrospectively with the MBSimP©™ to compare parameters of swallowing physiology. Videofluoroscopy followed a standard protocol using a teaspoon of thin liquid, a sip thin liquid, a teaspoon puree and a bite of bread. Results: Preliminary results for the teaspoon thin liquid show significant changes (Wilcoxon Test) in several MBSimP©™ components in the anterior surgery group; Anterior Hyoid Movement (p = .014); Epiglottic Movement (p = .034); Pharyngeal Stripping Wave (p = .011); Paryngo-Esophageal Segment Opening (p = .014); Tongue Base Retraction (p = .014) and Paryngeal Residue (p = .004). In the posterior surgery group only Laryngeal Elevation showed significant changes (p = .046). There were no significant differences in the other MBSimP©™ components. No statistical significant changes in the Pen/Asp Scale before and after the surgery could be shown for both groups (anterior: p = .655; posterior: p = .317). Further analysis is under progress. Conclusion: The results seem to provide valuable information which possibly may allow early detection of risk patients and lead to an optimized management concerning oral intake and therapeutic intervention. Continuing additional research is pursued.

PPL.4 EFFECTS OF NEUROMUSCULAR ELECTRICAL STIMULATION (NMES) ON SALIVARY FLOW IN HEALTHY ADULTS
K. Nagoya; Y. Ihara; Y. Takei; S. Nozue; Y. Uesugi; G. Koike; K. Taka
hashi/ Department of Special Needs Dentistry, Division of Oral Rehabilitation Medicine, Showa University Sc, Japan
Introduction : In our clinical practice of dysphagia treatment, we frequently experience complaint of increased saliva during application of Neuromuscular Electrical Stimulation (NMES). The aim of present study is to investigate the effects of NMES on salivary flow. The salivary flows with and without electrical stimulation were measured and compared under conditions of rest and gum-chewing. Material & Methods : This study was carried out on nine healthy adults (average age 31.1 years). In this study, the amplitude of the electrical stimulation was set at the level of 75% from the pain threshold for each subject. NMES was delivered by surface electrodes on the motor points of the suprathyroid muscles. The resting and gum-stimulated salivary flows were measured before and during NMES. Subjects were instructed to expectorate (spit) any pooled saliva into the cup. Resting saliva was pooled for 15 minutes, and stimulated saliva was pooled for 10 minutes while chewing tasteless paraffin gum. All experiments were examined on same conditions (time of day, room temperature and humidity). Results: Six of 9 subjects demonstrated increased resting salivary flow with electrical stimulation compared with no stimulation, While three demonstrated a decrease. On stimulated salivary flow, five of 9 subjects demonstrated a decrease and 3 demonstrated an increase, 1 remained the same. Conclusions: These results indicate that NMES was effective in increasing resting salivary flow in two-thirds of healthy adult subjects.
**PPL.5 SWALLOWING IN PATIENTS WITH LARYNGITIS**

**R. Dantas**; 1 Modal Medical School of Ribeirão Preto University of São Paulo, Brazil

**Introduction:** Laryngitis is an extra-esophageal manifestation of gastroesophageal reflux disease, but may also be caused by tobacco, alcoholic beverages, rhinopharyngeal infections and traumatic lesions. Our hypothesis is that the lesions seen in the disease may affect normal swallow. **Material and Methods:** We investigated the swallows of 21 patients with laryngitis (14 women and 7 men; mean age 50 years) and 21 normal controls (14 women and 7 men; mean age 50 years). In the laryngoscopic examination done on patients, the main laryngeal alterations found were hyperemia and posterior laryngeal edema (71%), hyperemia and edema of the vocal folds (29%) and laryngeal pachydermia (19%). Patient complaints included hoarseness (86%), chronic throat clearing (86%), heartburn (76%), acid regurgitation (76%), globus (71%) and multiple swallows (62%). In the videofluoroscopic examination, each subject swallowed a 5 mL liquid, 5 mL paste and solid bolus in a random sequence. **Results:** There was no difference between patients and normal controls with the swallows of liquid bolus. With paste bolus, the preparation phase of swallow was longer in patients (mean: 4691 ms, CI 95%: 3655-5728 ms) than in controls (mean: 2700 ms, CI 95%: 2018-3382 ms; p=0.002). With solid bolus, the oral transition duration was shorter in patients (mean: 548 ms, CI 95%: 419-677 ms) than in normal controls (mean: 1533 ms, CI 95%: 518-2548 ms; p=0.012). Conclusion: Patients with laryngitis have a longer paste bolus preparation phase of swallow than normal controls. With solid bolus, the oral transition duration was shorter in patients than in controls. With solid bolus, the oral transition duration was shorter in patients than in controls.

**PPL.6 EXAMINING POST-SWALLOW RESIDUE BY BOLUS TEXTURE AND SWALLOW TYPE**

**L.F. Riquelme**; A. Davis; P. Dhillon; E. Johnston; S. Lee; L. Lovelett; T. Rush; M. Santander; S.M. Molfenter

**Introduction:** Recently, researchers have quantified post-swallow residue using the normalized residue ratio scale (NRRS) for thin liquid swallows (Moltenter & Steele, 2013). Our aim is to expand the literature by reporting NRRS across textures (thin vs pudding) and swallow types (terminal vs non-terminal swallows). Materials & methods: Videofluoroscopic data from 180 swallows of thin (n=61) and pudding (n=119) thick boluses were analyzed for residue in the vallecula (NRRSv) and in the pyriform sinuses (NRRSp). Swallows were extracted from a sample of 50 patients with mixed neurogenic dysphagia. All swallows included in this analysis were the initial swallow that was executed for a given bolus. They were categorized as ‘terminal’ (a single swallow was executed for the bolus) and ‘non-terminal’ (one or more clearing swallows followed the initial swallow). Two-way ANOVAs were conducted for each residue location to test the influence of bolus texture and swallow type. Two-tailed p-values of <0.05 were considered statistically significant. Results: While descriptive statistics revealed greater NRRSv and NRRSp scores for pudding compared with thin liquid, results were not statistically significant. NRRSv scores were statistically lower in terminal (mean=0.095, SD=0.18) compared to non-terminal swallows (mean=0.199, SD=0.22) [p=0.010]. Post-hoc explorations of 95% confidence intervals by swallow type reveal NRRS thresholds that necessitate a secondary clearing swallow (NRRSv > 0.15, NRRSp < 0.22). Discussion: This dataset confirms that single, terminal swallows have lower amounts of residue compared with non-terminal swallows and reveals specific thresholds for eliciting clearing swallows that differ by residue location. Future research should investigate aspiration risk with residues above and below these thresholds.

**PPL.7 COMPARISON BETWEEN RIGHT VAGUS NERVE AND LEFT VAGUS NERVE IMPLICATIONS IN VENTILATORY PATTERN DURING SWALLOWING**

**Y. Quahchi**; C. Duclos; J.P. Marie; E. Verin

**Introduction:** Vagus nerves are implied in swallowing. However, the relative contributions of each vagus nerve in swallowing process and in ventilatory pattern during swallowing are not known. Our aim was to study separately the consequences of right cervical vagotomy and the consequences of left cervical vagotomy on ventilatory pattern during swallowing. Material & Methods / Three groups (N=14) of Wistar rats were studied by barometric plethysmography during water swallowing. They were explored firstly at healthy state. Then, a right cervical vagotomy was made in the first group, a left cervical vagotomy was made in the second group and the third group was a SHAM group. A second exploration by barometric plethysmography during water swallowing was made after surgery. We determined inspiratory time (TI), expiratory time (TE), total time of breathing cycle (TT=TI+TE), tidal volume (VT) and ventilatory drive (VT/TI) during water swallowing at healthy state and after surgery. We determined also the respiratory phase preceding and following swallowing apneas. Results / During swallowing, TT increased following right cervical vagotomy (0.42±0.05 s vs 0.63±0.13 s) (p<0.001) and following left cervical vagotomy (0.47±0.07 s vs 0.62±0.08 s) (p<0.001) compared to healthy state. However, it remained constant in the SHAM group. VT remained always constant and VT/TI decreased after right and
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after left cervical vagotomy compared to healthy state. Swallowing apneas were often preceded and followed by expiration in all conditions. The comparison of ventilatory variables during swallowing between the 2 vagotomized groups did not show any differences. Conclusions / Our results show that vagus nerves participate in the control of ventilation during swallowing by increasing ventilatory drive. This role does not differ between right and left vagus nerves suggesting that functional vagal innervation of upper airways is symmetric.

PPL.8 PHARYNGEAL SWALLOWING DURING WAKE AND SLEEP STATES
K.M. Lamvik; R.D. Jones; E. Guia Hernandez; M.L. Huckabee / University of Canterbury Rose Centre for Stroke Recovery and Research, New Zealand

Introduction: Data suggest that in healthy controls, swallowing–respiratory coordination (SRC) is altered by the degree of volitional input into swallowing but not level of arousal.1 This is illustrated in a patient with brain stem stroke where severely impaired SRC when awake normalises during sleep, suggesting a disruptive influence of cortical modulation. Comparison of swallowing in sleep compared to wake conditions may inform us similarly on the role of volition and arousal in control of pharyngeal swallowing. Materials & Methods: We explored pharyngeal pressure generation during sleep and wake conditions in a case series of three patients with swallowing impairment (mean age of 60 years, range 33–66 years) and 20 healthy participants (mean age of 27 years; range 21–52 years). The patients with dysphagia had previously been identified to present mis-sequence pharyngeal pressure, which resolved to functional levels following treatment. The latency and amplitude of pharyngeal pressure generation was measured with conventional and high-resolution manometry (HRM) during sleep, and within-subject comparisons were made between supine sleep and upright swallowing conditions. Results: Immediately prior to the sleep study, the mean peak-to-peak latency of Patient 1 was 31 ms (95% CI, −71–133 ms), but this reverted to −58 ms (95% CI, −120–4 ms) when asleep. These outcomes were replicated in Patient 2, whose peak-to-peak latency regressed to −7 ms (95% CI, −83–97 ms) during sleep, from his pre-sleep latency of 93 ms (95% CI, 19–166 ms). Analysis of data from Patient 3 and healthy controls is currently being completed and will be reported. Conclusions: This study is the first to characterise differences from wake to sleep swallowing using pharyngeal manometry in patients and healthy controls. Analyses of swallowing in sleep may inform us on the role of volition in swallowing motor control, which is of interest when considering rehabilitation protocols.

PPL.9 EXPLORING THE EFFECTS OF SYNCHRONOUS PHARYNGEAL ELECTRICAL STIMULATION AND CARBONATED WATER ON CORTICAL EXCITABILITY IN THE HUMAN PHARYNGEAL MOTOR SYSTEM.
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Introduction: Previous reports have revealed that excitation of human pharyngeal motor cortex can be induced by pharyngeal electrical stimulation (PES)1 and carbonated water (CW).2 This study is aimed to investigate whether synchronously combining PES with swallowing (of still water, SW or CW) can potentiate this excitation in pharyngeal cortical area. Our hypothesis was that combining inputs would potentiate cortico-pharyngeal excitability compared to each alone which would be more advantageous in the rehabilitation of dysphagic patients. Materials & Methods: Eleven healthy volunteers (3 females, age range 19–35 yrs) participated and were intubated with an intraluminal catheter for delivering PES and recording pharyngeal electromyography. Each underwent baseline transcranial magnetic stimulation (TMS) cortico-pharyngeal area. Our hypothesis was that combining inputs would potentiate cortico-pharyngeal excitability compared to each alone which would be more advantageous in the rehabilitation of dysphagic patients. Materials & Methods: Eleven healthy volunteers (3 females, age range 19–35 yrs) participated and were intubated with an intraluminal catheter for delivering PES and recording pharyngeal electromyography. Each underwent baseline transcranial magnetic stimulation (TMS) cortico-pharyngeal and hand motor evoked potential (MEP) measurements bilaterally. Subjects were then randomised to receive one of four 10-minute interventions (PES only, ShamPES+CW, PES+CW and PES+SW). Pharyngeal and control hand MEPs were then re-measured for up to 60 minutes. Data were analysed using ANOVA and post hoc t-tests. Results: Two way repeated measures ANOVA comparing pharyngeal MEP amplitude changes in the dominant hemisphere for Interventions×Time showed a significant interaction, F(1, 10)=7.072, P=0.024. One way ANOVA for each Interventions indicated significant changes for PES only (P < 0.01) and ShamPES+CW (P < 0.05) but not PES+CW or PES+SW over time. Subsequent post-hoc t-tests showed the significant increase immediately for ShamPES+CW (P < 0.05) and at 60 minutes for the PES only intervention (P < 0.05) (Figure 1). Conclusions: Of the interventions applied, only PES alone was able to induce sustained changes in pharyngeal cortical excitability that built up over time. Combination stimuli by contrast were less effective in promoting enhanced excitability. Our data suggest that PES alone may give some advantages to dysphagic patients who have a difficulty in performing voluntary swallows.

PPL.10 SWALLOWING STUDY IN RATS BY PLETHYSMOGRAPHY: EFFECT OF AFFERENTS PHARYNGEAL ON ALTERNATION VENTILATION/SWALLOWING
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Background: Oropharyngeal dysphagia is often accompanied by a pharyngo laryngeal sensory deficit which could explain the occurrence of delayed swallowing reflex, causing aspiration. For these patients, it seems worthwhile to find ways to improve swallowing coordination and reduce the risk of aspiration. In current practice it is proposed to change liquid properties (thermal, sensory (bubbles) or taste (sweet, salty, acid)). Objectives: to demonstrate in animals the efficacy of liquid modifications and afferents during swallowing to improve swallowing and ventilation coordination. Methods: 42 healthy male rats, WINSTAR were included in this study. They were divided according to the oropharyngeal afferents studied in 6 groups of 7 rats. Swallows were studied with a barometric whole body plethysmograph. Each sequence was recorded on a computer with a manual analysis of breakdowns / swallowing. Each
Introduction Swallowing is separated three phases by using food movement: oral, pharyngeal and esophageal, which moves together from oral cavity to the stomach in apparently continuous motion. Many studies have focused on the oral and pharyngeal phase of swallowing, and suggested that the basic patterns of swallowing are affected by both peripheral feedback and central afferent inputs. However, the details of esophageal phase of swallowing remain unclear. The aim of our study is to investigate how esophageal stimulation changes initiation of swallowing reflex and pattern of swallowing movements in humans.

Material & Methods: Nine healthy male adults participated in this study. Video endoscopy (VE) was performed transnasally and oral catheter were passed from the other nasal cavity. VE placed just above the uvula and the catheter inserted into esophagus through the cricopharyngeal muscle and the tip of catheters put at 3, 8, 13 or 18 cm from the cricopharyngeal part. Surface EMG were recorded using pairs of surface electrodes of both the right and left masseter and suprahyoid muscles. Esophageal stimulation were documented by intraesophageal injection of water, thickened fluids or air (0.2ml/s) and recorded using pairs of surface electrodes of both the right and left masseter and suprahyoid muscles. Surface EMG were performed transnasally and nasal catheter were passed from the other nasal cavity. Ve placed just above the uvula and the catheter inserted into esophagus through the cricopharyngeal muscle and the tip of catheters put at 3, 8, 13 or 18 cm from the cricopharyngeal part. Surface EMG were recorded using pairs of surface electrodes of both the right and left masseter and suprahyoid muscles. Esophageal stimulation were documented by intraesophageal injection of water, thickened fluids or air (0.2ml/s) and the latency of first swallow was measured using VE. Results The latency became gradually shorter in order of 18, 13, 8 and 3 during injecting water and thickened fluids. There was no significant difference during injecting air. It was shorter in the esophageal injection of 3 during injecting water compared to thickened fluids (P < 0.05). Conclusions The sensitivity of triggering swallowing reflex increased with upper esophagus region. Moreover, swallowing reflex of upper esophagus region was affected by changes of mechanical stimulations. The present results suggest that initiation of esophageal swallowing reflex is dependent on esophagus region and modulation of mechanical stimulations.

15:30 - 16:00  Exhibition Hall
Session 15M  Poster viewing, Dysphagia in stroke and brain damage

PPM.1 HOW COMMON ARE SWALLOWING PROBLEMS AFTER MILD STROKE AND DOES IT MATTER?
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Introduction: After severe strokes, dysphagia is common and these patients are known to have a poorer prognosis. The proportion of patients with less severe strokes who suffer swallowing problems is unclear, and their outcomes uncertain. This study aimed to quantify the prevalence and consequences of swallowing problems after mild, non-disabling stroke. Material & Methods: Consecutive acute stroke patients (n=272) with a median baseline National Institutes of Health Stroke Scale score of 5(IQR 3-7) underwent a bedside swallow assessment categorising them as safe or unsafe to swallow. Silent aspirators were detected radiologically after use of a contrast agent as test liquid. Simultaneous pulse oximetry identified other possible silent aspirators from significant desaturation without clinical signs. A randomly selected subgroup of those scoring ‘safe’ on the bedside assessment underwent videofluoroscopy (n=54/163). Swallow assessment data were combined to describe patients as safe, unsafe or silent aspirators, and outcomes recorded prospectively. Results: Overt aspiration on the bedside assessment was seen in 109(272)(40%) patients. Radiological aspirated contrast was seen in 7(163)(4%) of those passing the assessment. Desaturation by >5% occurred in 3(2%). Combining clinical assessments identified overt aspiration in 109(40%) patients and silent aspiration in 10(4%). Of those undergoing videofluoroscopy, 15(54)/28% patients demonstrated silent aspiration. Advanced age, weak volitional cough, abnormal voice and higher baseline stroke severity independently predicted aspiration. Aspirating patients tended to have poorer outcomes, with length of hospital stay independently predicted by aspiration. Conclusions: Swallowing problems are common in mild to moderate stroke patients. No single assessment strategy can reliably identify silent aspirators and additional assessments should be used if it is suspected. Aspiration is predictive of longer hospital stay.

PPM.2 TYPE I ARNOLD-CHIARI MALFORMATION AS A CAUSE OF OROPHARYNGEAL DYSPHAGIA. A CASE REPORT.
J. Pedro; J. Mallol; R. Delia; S.M. García; A. Sansano; S. Pizarro/ Consorci Sanitari Integral., Spain

Introduction: we review an uncommon entity that may appear in Arnold-Chiari malformation Type I. Patient: young male with dyspnea and fever who reported 6 month’s evolution neck pain and progressive dysphagia. Suspecting aspiration pneumonia, a complete and directed medical history on the topographical areas that govern swallowing and a series of additional tests, to rule out other causes of dysphagia, were held. Cranial MRI confirmed the diagnosis of type I Arnold-Chiari malformation. The patient was surgically intervened through suboccipital decompression. 6 months after surgery there was an improvement in neck pain and dysphagia disappeared. Discussion: dysphagia is an unusual symptom of type I Arnold-Chiari malformation usually due to alteration by compression of the brainstem and/or to elongation of the lower cranial nerves. To achieve early di-
A. Lendínez Mesa; S.J. Grantham; M. Casero Alcázar; F. Paredes; M.C. Diaz; A. Ramos Sanchez; A.S.F. Ribeiro / Fundación Instituto San José, Spain

PPM.3 THE IMPACT OF OROPHARYNGEAL DYSPHAGIA WITHIN A BRAIN INJURY REHABILITATION UNIT.

A. Lendínez Mesa; S.J. Grantham; M. Casero Alcázar; F. Paredes; M.C. Diaz; A. Ramos Sanchez; A.S.F. Ribeiro / Fundación Instituto San José, Spain

Introduction/objectives: Oropharyngeal dysphagia is common in neurologic diseases: This syndrome remains a serious problem with nutritional and respiratory complications that can cause the patient's death (O’Neil et al, Dysphagia 1999; 14; 139). The main objective of this study is to determine the prevalence of patients with oropharyngeal dysphagia within a Brain Injury Rehabilitation Unit (BIRU). Secondary objectives: To determine the functional status and etiology that affects the possible occurrence of oropharyngeal dysphagia in these patients. Patients/Methods: A cross-sectional study was designed, with the analysis of data collected from a population of all patients admitted to a hospital in Madrid in the BIRU during a 20 month period. Results: From March 1st, 2012 to November 30th, 2013 102 patients were admitted to the BIRU. The sample consists of 33% women and 67% men with a mean age of 54.7±12.1 years. The average hospital stay was 62.0±117.9 days. A prevalence of oropharyngeal dysphagia was observed in 47.1% patients, and 22 new cases were diagnosed with oropharyngeal dysphagia within the unit. The incidence of oropharyngeal dysphagia is displayed with a primary diagnosis of stroke (29.2%), 25% with ischemic stroke and 18.8% with Traumatic brain injury. 90% of patients diagnosed with dysphagia presented a level of total dependence, whereas 8% and 2% severe to moderate dependence. Discussion/Conclusion: In this study we can conclude that the prevalence of dysphagia within this BIRU is very high, which indicates the need to recognize the importance of an early diagnosis of swallowing difficulties mainly in patients with cerebrovascular disease and a total / severe dependence level. In recent years there has been an increase of patients diagnosed with dysphagia within medium to long stay units, many are infra diagnosed from referral hospitals, causing various complications and therefore possibly increasing, the rate of morbidity/mortality.

PPM.4 THE PREVALENCE OF OROPHARYNGEAL DYSPHAGIA IN ACUTE STROKE PATIENTS AT SRINAGARIND HOSPITAL

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Introduction Oropharyngeal dysphagia is a common disorder in acute stroke patient, leading to serious sequelae such as pneumonia and malnutrition. Knowing the prevalence and associated factor of dysphagia is beneficial for preventing complication, which was the purpose of this study.

Material & Methods The prospective descriptive study yielded 114 from 170 participants of acute stroke patients admitted in Srinagarind hospital, Khonkaen University, Thailand, whom did not have the history of dysphagia, head and neck surgery and clinical stable, were included in the study. Swallowing function were assessed using dysphagia risk screening test and modified water swallowing test. Score less than 4 on modified water swallowing test was diagnosed oropharyngeal dysphagia. Results Of these 114 participants, 57.9% were male with mean age of 61.8(±13.9). Score less than 4 on MWST were found 10.5%. Acute infarction was the majority (82.5%), and the mainly site and side of stroke patients were subcortical area (50.9%) and the right (54.4%). The median NIHSS was 7 (IQR4,13.3) and mean TMSE and barthel index were 15.7(±9.7) and 55.2(±30.4). Dysphagia risk screening test showed 58.8%, 29.8% and 27.2% in dysarthria, abnormal gag reflex and weak cough, respectively. The type, site and side of stroke and old CVA had no significant association with dysphagia (p>0.05). The risk of dysphagia were barthel index (RR 48.5, 95%CI 32.4-64.5), TMSE (RR 7.3, 95%CI 1.6-13.0) and NIHSS (RR 7.9, 95%CI 4.2-11.5). Conclusions Then, the prevalence of dysphagia in acute stroke patient was 10.5%. The low barthel index, low TMSE and high NIHSS were the associated risk of dysphagia.

PPM.5 PROFILE OF CAREGIVERS AND THEIR KNOWLEDGE OF DYSPHAGIA IN HOSPITALIZED PATIENTS WITH SEQUELAE FROM CEREBROVASCULAR ACCIDENTS

L.N.P. Abreu; A.M. Furkim; R.G. Silva; A.C.M. Ghirardi; F.S. Soria; W. Nascimento; R.S. Santos / Universidade Tuiuti do Paraná, Brazil; Universidade Federal de Santa Catarina, Brazil; Universidade Estadual Paulista, Brazil; Faculdade Assis Gurgacz, Brazil; Universidade de São Paulo, Brazil

Introduction: Cerebrovascular Accidents (CVA) are the greatest cause of acquired motor impairment in adults, and the first cause of impairment and death in the world. Dysphagia caused by CVA is responsible for 51% of disabilities found in hospital admittance. Due to its complexity and need for specific care in each case, patients need multidisciplinary and Speech-Language Pathology assistance, as well as aid from caregivers in order to maintain and monitor feeding, considering the high risk of aspiration pneumonias and nutritional complications. Thus, the purpose of this study is to determine the profile of caregivers and their knowledge of oropharyngeal dysphagia and the special care during feeding of dysphagic patients. Method: Cross-sectional descriptive study with 59 caregivers of dysphagic patients from the São José City Hospital (Hospital Municipal São José) in the city of Joinville, between July and August
The entire examination took up to 60 minutes, using proper dental assessment, including medical history, bed-side oral examination score (BOE - mild, moderate, or severe), and clinical attachment levels) were thoroughly examined. The older patient group showed the need for specific guidance regarding the difficulties in recognizing the signs and symptoms of dysphagia present in patients with systemic diseases is periodontitis. Literature suggests a relationship between active periodontal disease and severe score for BOE was observed (P=0.01). Activity of periodontal disease was often related to cases of severe periodontitis (P=0.01). Severity and activity of periodontitis showed dependence on patient brushing habits (P=0.03 and P=0.05 respectively). Conclusion: There is increasing interest about the relation between oral hygiene status and systemic healthcare in rehabilitation setting, which is frequently overlooked due to patient limitations. Brain-damage patients had a poor clinical oral health status across a range of oral-, dental-, and periodontal-related parameters. Further and better structured studies are required to define evidence-based approaches for such clinical reality.

PPM.6 COMPREHENSIVE ORAL-HEALTH ASSESSMENT OF BRAIN-DAMAGED PATIENTS IN REHABILITATION SETTING
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Introduction: Hospitalization negatively impacts oral health as demonstrated by increased accumulation of dental plaque and oral-colonization by respiratory pathogens. One of the conditions commonly associated with systemic diseases is periodontitis. Literature suggests a relationship between impaired oral health and systemic diseases (e.g. endocarditis and stroke). The objective of this pilot study was to perform a detailed clinical assessment of oral health, as well as oral-health-related social and behavioral aspects, in patients with brain damage. Methods: Twelve brain-damaged patients were recruited. Patient’s social and behavioral history, bed-side oral examination score (BOE - mild, moderate, or severe), tooth condition (defect/ filled), and periodontal status (bleeding, plaque presence, and clinical attachment levels) were thoroughly examined. The entire examination took up to 60 minutes, using proper dental assessment (arch explorer and UNC-15 probe). Results: All evaluated patients were diagnosed with generalized chronic periodontitis. A trend for dependence between severe score for BOE and severe periodontitis was present (no cases of mild periodontitis were present for severe BOE group). A relationship between active periodontal disease and severe score for BOE was observed (P=0.01). Activity of periodontal disease was often related to cases of severe periodontitis (P=0.01). Severity and activity of periodontitis showed dependence on patient brushing habits (P=0.03 and P=0.05 respectively). Conclusion: There is increasing interest about the relation between oral hygiene status and systemic healthcare in rehabilitation setting, which is frequently overlooked due to patient limitations. Brain-damage patients had a poor clinical oral health status across a range of oral-, dental-, and periodontal-related parameters. Further and better structured studies are required to define evidence-based approaches for such clinical reality.

PPM.7 THE DEVELOPMENT AND IMPLEMENTATION OF AN ORAL HYGIENE POLICY TO AN ACUTE NEUROLOGICAL REHABILITATION UNIT
R. Elder; F. Bell/ The Wellington Hospital, United Kingdom
Introduction Poor oral hygiene can cause aspiration pneumonias, other systemic infections and lead to fatalities and extended hospital admissions. Secondary to their illness or injury, many patients at The Wellington Hospital are unable to manage their own oral care and are dependent on hospital staff to maintain this. Material & Methods A literature review was completed and preliminary audits of patient’s oral health status showed that 50-70% of patients were at high risk of developing oral care complications. Further audits of staff knowledge, equipment and documentation, confirmed the need for the development of a standardised assessment tool, procedure and policy. In-line with evidence based practice, a 24 hour oral cleansing and suctioning system (SAGE Products Inc., 04) was sourced for the care protocols. This provides four hourly oral care episodes to patients, which research suggests is the minimum frequency for preventing oral health deterioration and maintaining staff compliance. Results A six week trial of the developed assessment tool and equipment was conducted, measuring the oral health status of the patients pre and post intervention plus a qualitative measure of nursing opinion. Patient’s oral hygiene status either remained stable or improved during this trial, with very positive feedback from nursing. Financial implications for the hospital were also researched and it was concluded that with the new system in place, overall cost of oral care equipment is lower. Conclusions This policy is now in the implementation stage, which includes bi-annual staff training and frequent re-auditing to ensure compliance and success. Future plans include ensuring that provision of oral care for patients is an inter-disciplinary responsibility within the unit. Furthermore to determine whether the implementation of this oral care package has impacted on the hospital acquired pneumonia rates.

PPM.8 THE PREVALENCE OF SWALLOWING PROBLEM IN NEUROLOGIC PATIENTS
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Introduction: Swallowing problem is common condition among patients with neurological disease. Many instruments are purposed to assess the swallowing function. The 10-item Eating Assessment Tool (EAT-10) is a validated, self-administered, tool for swallowing problem screening. The EAT-10 is widely used and easy to administration in clinical practice. The objective of this study aimed to report the prevalence of swallowing difficulty among patients with neurological disease using EAT-10. Material & Methods: The patients with neurological disease who admitted at rehabilitation ward, Srinagarind hospital from June 2014 to April 2015 were recruited. All patients were asked to complete the EAT-10 which consists of 10 questions. Patients may have swallowing problem if the score is 3 or greater. Results: One hundred and thirty-three patients, mean age 68±7 years, were enrolled the study. Of these patients, the diseases were defined as spinal cord lesion (52%), stroke (44%) and brain tumor (4%). The prevalence of swallowing problem based on EAT-10 score in patients with spinal cord lesion, stroke and brain tumor were 96%, 43% and 100% respectively. The top three problems in patients with spinal cord lesion were “Swallowing pills takes extra effort”, “Swallowing solids take extra effort” and “When I swallow food sticks in my
throat” Conclusions: About forty percent of patients with spinal cord lesion reported swallowing problem as documented with EAT-10, therefore dysphagia screening test is necessary not only for the patient with brain lesion but also for the patient with spinal cord lesion.

PPM.10 INVESTIGATION OF OROPHARYNGEAL DYSPHAGIA IN IRANIANS AFTER STROKE

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Introduction: Dysphagia is the most common and the earliest problem after stroke. Evidences have shown that the hospitals which use formal or informal screening tests for dysphagia and the appropriate treatment protocols have lower incidence of Pneumonia. Therefore, identification and treatment of this disorder in CVA (Cerebrovascular Accident) is vital. Speech and language pathologists (SLPs) have played an important role in detecting these problems. But in Shiraz/Iran SLPs are not involved in inpatient diagnosis. Hence, they miss the benefits of early intervention in these patients. Our aim in this study was investigating the oropharyngeal dysphagia after stroke in inpatient settings. This study was important for: 1- The health policy research center in Shiraz to consider the roles of SLPs in swallowing disorders. 2- SLPs in Shiraz to participate actively in stroke management teams. 3- Scientists in the world to understand the differences and similarities in the prevalence of dysphagia in different regions with different cultures, languages and nutritional habits. Material & Methods: Eighty patients with CVA who were admitted in Shiraz hospitals were participated in this study. An interview checklist and the Mann Assessment of Swallowing Ability (MASA) were used by the experienced SLPs in dysphagia management to investigate the swallowing disorders of patients. The descriptive, T-test, Mann-Whitney and x2 analysis were used for the analysis. Results: Thirty five male, 45 female with the mean age of 59.75 (SD: 16.41) were participated in this study. According to MASA, 44% of participants had mild to severe dysphagia (mild: 13%, moderate: 32%, severe: 8%). Conclusions: The results show that dysphagia should be considered as a serious complication in inpatient settings in Iran and needs multidisciplinary rehabilitation approach. Beside other professionals who are involved in diagnosis, assessment and treatment of patients after stroke, SLPs can play an important role in the management of CVA.

PPN.1 CHARACTERISTIC OF TONGUE AND SWALLOWING PRESSURE IN PATIENTS WITH NEUROMUSCULAR DISEASES

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Introduction: This study aims to demonstrate the characteristic of tongue and swallowing pressure in patients with myotonic dystrophy type 1 (DM1), Duchenne muscular dystrophy (DMD), and amyotrophic lateral sclerosis (ALS). Methods: Thirty DM1 patients (male 16, female 14, mean age 48.0 y.o.), sixteen DMD patients (male 16, mean age 22.3 y.o.) and twenty ALS patients (male 8, female 12, mean age 68.8 y.o.) were recruited. They underwent separately measurements of tongue pressure and swallowing pressure with videofluoroscopy for swallowing using 3 mL of barium water and gelatin jelly as a test food. We measured the largest change of swallowing pressure in the hypopharynx and the upper esophageal sphincter (UES) during the several swallowing. Results: The mean values of the maximum tongue pressure were 14.1±6.6 kPa in the DM1 group, 21.6±8.0 kPa in the DMD group, and 13.2±10.2 kPa in the ALS group. The mean values of the maximum swallowing pressure in the hypopharynx and the UES were 111.8±92.4 mmHg and 56.1±30.8 mmHg in the DM1 group, 174.4±119.9 mmHg and 224.9±134.8 mmHg in the DMD group, and 189.0±81.8 mmHg and 169.2±85.4 mmHg in the ALS group. There was a significant difference in the change of pressure in the UES between DM1 group and the other two groups (p<0.01). Although there was no significant correlation between the maximum swallowing pressure and the other data in the ALS group, significant correlations were observed between the change of pressure in the UES and the age (DM1, p=0.01, R=-0.448; DMD, p=0.03, R=-0.579) in the two groups and...
between the change of pressure in the UES and the maximum tongue pressure (p=0.001, R=0.613) in the DM1 group. Conclusions: DM1 and DMD patients show long-term muscular dysfunction and tend to lose the ability to control the swallowing pressure with aging. On the other hand, the rapid progress of tongue weakness in ALS patients may induce dysphagia, even if the patients keep the swallowing pressure.

**PPN.2 DISCREPANCY BETWEEN DYSPHAGIA PERCEPTION AND VFS OUTCOMES IN MYOTONIC DYSTROPHY PATIENTS**

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Introduction. This study investigates the relationship between patients’ perception of swallowing (the extent of impairment experienced) and the swallowing function in myotonic dystrophy type 1 (DM1) patients. Material & Methods. Thirty five DM1 patients underwent videofluoroscopic swallowing examination (VFS). Vissuoperceptual ordinal and temporal measurements were analyzed. Perception of swallowing was assessed using two self-reported visual analogue scales: dysphagia severity scale (DSS) and dysphagia quality of life scale (DQoL). Clinical severity of the disease was assessed using the muscular impairment rating scale (MIRS). Spearman’s correlation coefficient was used to measure the direction and strength of associations. Results. VFS outcomes showed that swallowing function was significantly impaired in DM1 patients. Postswallow vallecular pooling and piecemeal deglutition were the most impaired outcome variables. Lower scores on the DSS and DQoL, indicating perception of swallowing impairment, were associated with an increased duration of the oral transit time (thin liquid rho= -0.496/rho= -0.762 and thick liquids rho= -0.574/rho= -0.412), and an increased duration of the laryngeal closing time (thick liquids rho= -0.478/rho= -0.583). The DQoL outcome was also associated with upper esophageal sphincter opening duration (thick liquid rho= -0.424) and laryngeal closing time (toast rho= -0.418). Increased piece-meal deglutition scores was associated with lower scores on DSS (toast rho= -0.514). No associations were found between the two analogue scales (DSS and DQoL) and MIRS. Conclusion. Although swallowing function is significantly altered in DM1 patients, as demonstrated by the VFS measurements, few associations with patients’ perception of swallowing were observed. The DSS and DQoL cannot be used as an indicator for the severity of oropharyngeal dysphagia in DM1. A multidimensional swallowing assessment protocol remains necessary.

**PPN.3 EVALUATION OF ASPIRATION PREVENTIVE EFFECTS OF CARBONATED DRINKS USING FREQUENCY ANALYSIS OF SWALLOWING AND RESPIRATORY SOUNDS**

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Introduction: Carbonated drinks are considered to promote swallowing movement due to stimulation by carbonic acid, and their use in the training of patients with dysphagia has been reported. In this study, we evaluated the swallowing dynamics on drinking a carbonated beverage using neck auscultation as a noninvasive method. Material & Methods: The subjects consisted of 7 aged patients (mean age, 84.6 ±5.6 years) with dysphagia due to central nervous system disorder and 11 healthy young controls (mean age, 20.8 ±0.6 years). Concerning the severity of dysphagia, the patients did not swallow saliva ≥3 times/30 seconds, or they showed coughing or changes in voice following the swallowing of 10 mL of water but with no decrease in oxygen saturation. Subjects swallowed 5 and 10 mL of water or a carbonated drink. Sounds during swallowing and respiratory sounds after swallowing in the neck were captured using the microphone and recorded on a PC. For analysis, the swallowing sound continuation time and first and second peak components of the swallowing sounds were calculated. For respiratory sounds, the mean level in each band was calculated using constant bandwidth analysis at 250 Hz. Results: In the aged patients, the swallowing continuation time significantly decreased with 5 mL carbonated drink compared to with the same volume of water. Frequency analysis showed higher levels in the 3-kHz band as the second peak component of the swallowing sounds and bands ≥2.5 kHz for the respiratory sounds when the aged patients swallowed 10 mL of water compared with the young controls and the carbonated drink. Conclusions: Previous studies showed high levels in the high-frequency ranges of swallowing and respiratory sounds in patients with aspiration. In this study, the patients may have developed aspiration when swallowing 10 mL of water, but the results using the carbonated drink were similar between the aged patients and young controls, suggesting safe swallowing.

**PPN.4 THE EFFECTIVENESS OF ENDOSCOPIC CRICOPHARYNGEAL MYOTOMY ON UPPER OESOPHAGEAL SPHINCTOR DYSFUNCTION IN ADULTS WITH UOS DYSFUNCTION AND NEUROLOGICAL DISEASE: A SYSTEMATIC REVIEW**

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Introduction: UOS dysfunction may be caused by neurological disease, causing dysphagia and aspiration. If compensation/rehabilitation fails to improve functioning, surgical methods may be proposed. Endoscopic cricopharyngeal myotomy (ECPM) enables trans-sphincteric bolus flow by reducing UOS resting pressure. However, ECPM is controversial, with variable clinical indicators, surgical protocols and success rates. This study aimed to determine the effectiveness of ECPM on UOS dysfunction in adults with UOS dysfunction and neurological disease. Authors investigated if ECPM (i) reduces/eliminates aspiration of food and/or fluids, (ii) reduces mean UOS resting pressure, (iii) changes oral intake status, (iv) changes quality of life (QOL,) and (v) is associated with adverse events. Material & Methods: A systematic review regarding effectiveness of ECPM on UOS dysfunction in adults with neurological disease was conducted. Authors systematically searched electronic bibliographic databases, reference lists of included studies and grey literature. Three independent reviewers extracted data from eligible primary studies and assessed methodological quality using the PEDro scale and MINORS tool2. Results:Two eligible studies satisfied inclusion criteria. These were significantly heterogeneous with reference to study design and outcomes measured. Therefore it was not possible to conduct a meta-analysis. Due to low numbers of
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eligible studies and the poor methodological quality of those included, no conclusions may be drawn regarding the effectiveness of ECPM on UOS dysfunction in adults with neurological disease. Conclusions: This review emphasizes research deficiencies regarding ECPM effectiveness. Reliable and valid evidence regarding optimal candidacy selection, standardised post-operative management, complications and ECPM effects on aspiration/penetration, mean UOS resting pressure and QOL is urgently required to support ECPM’s increasing clinical usage.

PPN.5 A DYNAMIC VIDEOFLUOROSCOPIC EVALUATION OF NEUROMOTOR DYSPHAGIA

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Introduction: In an attempt to describe the disease-specific dynamics of swallowing in patients with neuromotor dysphagia, quantitative videofluoroscopic analysis was conducted using UC Davis Dynamic Swallow Study (UCD DSS, Leonard et al. 2000).

Materials and Methods: Subjects were 17 patients with neuromotor dysphagia who underwent videofluoroscopic examination at Hokkaido Medical Center. The subjects were divided into three groups according to background disorder; six cases with idiopathic Parkinson’s disease (PD group), five cases with amyotrophic lateral sclerosis (ALS group) and six cases with lower motor neuron disturbance (peripheral group). Lateral videofluoroscopic views during command swallow were recorded on a digital video recorder. Analysis of timing and structural displacement was made offline in accordance with the UCD DSS manual.

Results: Oropharyngeal transit time (OPT) was prolonged in 4 out of 6 subjects (67 %) in PD group. Significant difference in average times was observed between PD abd ALS (*p=0.035). Akinesia in Parkinson’s disease was supposed to be reflected in the delay in OPT. Hypopharyngeal transit time (HPT) was delayed only in one out of 5 subjects (20%) in ALS group. There was no delay of this parameter in PD and peripheral group. Onset of hyoid elevation was delayed in 2 out of 6 subjects (33%) in PD group and 1 out of 6 subjects (17%) in peripheral group suggesting the delayed onset of reflexive swallowing gestures. Pharyngeal Constriction Ratio was increased in over 80% of the subjects in each group. Significant difference in average (*p=0.047) was seen between PD group and peripheral group suggesting the severer atony in peripheral motor disorder.

Conclusion: The disease specific dynamics of neuromotor dysphagia could be explained reasonably in reference to the pathophysiological backgrounds of each disease group. Thus, the present study presented basic data for the construction of dynamic swallow patterning of neuromotor dysphagia.

PPN.6 THE SELF PERCEPTION OF MULTIPLE SYSTEM ATROPHY PATIENTS WITH SWALLOWING DISORDERS AND DROOLING AND ITS RELATION TO QUALITY OF LIFE AND DISEASE SEVERITY

Y. Manor1; D.S. Shpunt2; Y.Z. Zlotnik3; A.M. Migirov4; L.B. Brounshtain5; T.V. Yoler-Kohane5; L.T. Lupo6; T.G. Gurevich1; 1Tel Aviv Medical center, Israel; 2Tel Aviv medical center, Israel; 3Ono Academic College, Israel; 4Ono Academic college, Israel

Introduction: Multiple System Atrophy (MSA) is a progressive neurodegenerative disease. One of the severe outcomes of the disease is dysphagia, accompanied by drooling which has a significant effect on quality of life (QOL). Behavioral therapy is the common approach for dysphagia treatment. Objective: To characterize the relation between the self-perception of swallowing disorders and drooling in MSA patients and their QOL and disease severity. Material & Method: The study includes 12 MSA patients, 4 MSA-P, 8 MSA-C from the Movement Disorder Unit at Tel Aviv medical center. All the patients responded to several questionnaires including: drooling, swallowing disturbances questionnaire (SDQ), quality of life related to swallowing (SWAL-QOL) and United Multiple system Atrophy Rating Scale (UMSARS) parts 1,2 and 4. Montreal Cognitive Assessment (MoCA) was performed to all patients. Results: Mean age of the patients 65.3±8.77; disease duration 7.25±3.93; UMSARS 1+2 score 59.5±16.38; UMSARS 4 score 4.08±0.79; MoCA 22.5±6.5. The SDQ score demonstrated patients’ report on swallowing disturbances with mean of 13.92±8.75 (1+ significant swallowing disturbances). A significant correlation was observed between disease severity (1st and 2nd part of UMSARS) and report of drooling (r(12)=.62, p<.05). A significant correlation was noted between the disease severity (second part of UMSARS) (30.83±8.58) and the SDQ total score (r(12)=.60, p<.05) (13.92±8.75). According to the SWAL-QOL physical discomfort is the most affected part caused by the dysphagia symptoms. Conclusion: MSA patients with high disease severity will perceive themselves with drooling and worst swallowing disturbances. Feeling of discomfort while swallowing is the most common complaint of MSA patients with swallowing disturbances. The SDQ is a useful questionnaire that detects the swallowing disturbances in MSA as expected along the natural history of the disease. These findings may help developing.

PPN.7 MODIFICATION OF FOOD AND FLUID CONSISTENCY FOR SWALLOWING DIFFICULTIES IN DEMENTIA: A SYSTEMATIC REVIEW OF THE EVIDENCE

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Introduction: Modification of food and fluid consistency is a frequently used management strategy for people with dementia. This Cochrane review aimed to determine the effectiveness of this approach in improving oral intake and reducing laryngeal penetration and aspiration in adults with oropharyngeal dysphagia and dementia. Materials and Methods: Randomised controlled trials (RCTs) and quasi-RCTs published in any language were selected. Participants were adults with a clinical diagnosis of dementia with symptoms and/or signs of dysphagia and in whom aspiration has been confirmed by clinical assessment. Relevant databases including ALOIS (Cochrane Dementia and Cognitive Improvement Group’s Specialized Register), reference lists, and abstracts of conference proceedings were searched. Authors were contacted for unpublished data as relevant. Review authors independently examined titles, abstracts, and key words identified from the literature search. Authors assessed risk of bias for
Flow Analysis metrics, TNadImp-PeakP (time from Nadir Impedance to Peak Pressure) with medians and interquartile ranges presented. Of all Pressure Flow Analysis parameters, Coefficients of variation were compared using Mann–Whitney Rank Sum test. Coefficients of variation (STDEV/MEAN) were computed using MATLAB based AIMplot software. This derived swallow function metrics represent the pressure and impedance catheter, positioned trans-nasally, was used to record liquid saline swallows, 5x5mls and 5x10mls, offered at room temperature. Pressure Flow Analysis was performed with these recordings using the swallowing function metrics.

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Introduction: The ability to modulate swallowing features in relation to bolus volume and consistency is important for normal swallowing. Variability of swallow function is clinically relevant in dysphagia assessment, which is often limited to a small number of swallows. This pilot study aimed to quantify swallow variability using Pressure Flow Analysis comparing dysphagia patients and healthy controls. Materials and methods: Data from 10 patients with Motor Neuron Disease (MND) (58–91yrs), and 10 age matched controls (59–91yrs) were studied. In these subjects, a solid state pressure and impedance catheter, positioned trans-nasally, was used to record liquid saline swallows, 5x5mls and 5x10mls, offered at room temperature. Pressure Flow Analysis was performed with these recordings using MATLAB based AIMplot software. This derived swallow function metrics and the Swallow Risk Index. Coefficients of variation (STDEV/MEAN) were determined for all subjects, 5ml and 10ml swallows separately. Results: Coefficients of variation were compared using Mann–Whitney Rank Sum Test, with medians and interquartile ranges presented. Of all Pressure Flow Analysis metrics, TNadImp-PeakP (time from Nadir Impedance to pharyngeal Peak Pressure) was the only metric significantly more variable for patients 0.19[0.17, 0.25] compared to controls 0.09[0.07, 0.15] (p<0.05) for 5ml liquid swallows. Conclusion: In this pilot study TNadImp-PeakP was the only pressure-flow measure that was significantly more variable in MND patients on a swallow by swallow analysis. Previously, TNadImp-PeakP has correlated with evidence of pre-swallow pharyngeal bolus presence, which is expected amongst dysphagia patients who have reduced sensory swallow responses. Swallow to swallow variability was greatest with smaller 5ml boluses, consistent with the known challenge of reduced sensory responses for smaller volumes. Further studies in different patient cohorts are warranted.

PPN.9 ADJUNCTIVE ELECTROMYOGRAPHIC BIOFEEDBACK IN THE TREATMENT OF OROPHARYNGEAL DYSPHAGIA IN THE ELDERLY WITH PARKINSON’S DISEASE: A PILOT STUDY

N.M.A. Silva-Arone; C.T. Mituuti; A.G. Brasolotto; G. Berretín-Felix; 1University of São Paulo, Brazil; 2Federal University of Santa Catarina, Brazil

Introduction: The electromyographic (EMG) biofeedback was described as an important adjunctive method in the treatment of neurogenic and mechanical oropharyngeal dysphagia. This study verified the influence over time of EMG biofeedback as an adjunctive method in the treatment of oropharyngeal dysphagia in the elderly with Parkinson’s disease. Material & Methods: Six elderly people with Parkinson’s disease and oropharyngeal dysphagia were evaluated for the level of functional oral intake scale (FOIS), quality of life, severity of dysphagia and level of food residue in the oropharynx. All procedures were performed realized before, after three and six months of speech therapy treatment. Three individuals were treated with conventional therapy and three were treated with conventional therapy associated with adjunctive EMG biofeedback, in a total of 15 sessions (three times a week), followed by three more sessions (once a week), for maintenance. Results: The severity of dysphagia showed a significant difference between the times before and after three months of therapy (p<0.01). Non-significant differences were found for levels of residue and FOIS between the groups and the different times. Conclusions: Both modalities of therapy resulted in a decrease in the severity of dysphagia and EMG Biofeedback improved the swallowing quality of life. Further randomized and controlled studies with larger numbers of subjects are necessary.
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semitolids ($r = 0.56$), 10 ml semisolids ($r = 0.52$). A correlation between DL and EAT-10 scores was also found ($r = 0.55$). Conclusions: patients with DM1 present mild swallowing impairment, characterized by safe swallowing, pooling and piecemeal deglutition that significantly impact on patients symptoms.

**15:30 – 16:00**

*Session 15P*  
Exhibition Hall
Poster viewing, Dysphagia in geriatric patients

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**PPP.1 FACT-FINDING SURVEY FOR DRUG-INDUCED DYSPHAGIA**  
S. Nozaki; S. Katsuragi/ Hyogo University of Health Sciences, Japan  
Introduction: Psychotropic drugs are prescribed to treat conditions such as restlessness, delirium, depression and insomnia in the elderly, but sometimes cause serious dysphagia. Mild dysphagia makes taking prescription drugs difficult, which can affect drug efficacy. Few studies, however, have investigated the circumstances surrounding drug-induced dysphagia. This survey explored the pathology, course and background of onset of drug-induced dysphagia.  

**Materi & Methods:** A retrospective survey of drug-induced dysphagia was conducted among 231 medical professionals specializing in dysphagia. Results: Of the 231 respondents, 153 answered that they had encountered cases of drug-induced dysphagia. Eighty percent of patients were ≥70 years old and the drugs that caused dysphagia were antipsychotics, anxiolytics, hypnotics, anticonvulsants, antidepressants and dementia drugs. The most common drug causing dysphagia was risperidone. Doses were mostly standard doses. The most common interval from start of administration to onset of dysphagia was less than 7 days and the most common background of onset of dysphagia was delirium. Eighty percent of patients were ≥70 years old and the drugs that caused dysphagia were antipsychotics, anxiolytics, hypnotics, anticonvulsants, antidepressants and dementia drugs. The most common drug causing dysphagia was risperidone. Doses were mostly standard doses. The most common interval from start of administration to onset of dysphagia was less than 7 days and the most common background of onset of dysphagia was delirium. Eighty percent of patients were ≥70 years old and the drugs that caused dysphagia were antipsychotics, anxiolytics, hypnotics, anticonvulsants, antidepressants and dementia drugs. The most common drug causing dysphagia was risperidone. Doses were mostly standard doses. The most common interval from start of administration to onset of dysphagia was less than 7 days.

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**PPP.2 URINARY TRACT INFECTIONS: WHY IS THE SPEECH PATHOLOGIST INVOLVED?**  
R.D. Benjamin¹; L.F. Riquelme²; L.M. Holton³; G.K. Sandoval⁴  
¹Barrique Speech-Language Pathology at New York Methodist Hospital, New York Medical College, United States; ²New York Medical College, Barrique Speech Language-Pathology at New York Methodist Hospital, United States; ³Starr Farm Nursing Center, United States  
Introduction: It is widely accepted that urinary tract infections (UTI) are a leading hospital admission diagnosis (Riquelme, 2013). Patients with UTI often present with oropharyngeal dysphagia; however, how this is manifested is poorly understood. This study sought to address why the presence of a UTI may result in temporary dysphagia, and what factors trigger a request for consultation from Speech-Language Pathology (SLP).  

**Materi & Methods:** Participants were gathered from a retrospective sample of patients discharged from our acute care facility within a 6-month period with principal diagnosis of UTI. This study, of 288 patients, was conducted via chart review. Full sample is to be analyzed. A preliminary group of patients was divided into two sets: Group 1 (N=20): patients consulted by SLP and Group 2 (N=20): patients not consulted by SLP. A number of variables were explored, including age, gender, comorbidities, length of stay and readmission rates. A numerical diet scale was developed for comparison of diet upon admission and on discharge. Results: Full data collection for 288 patients to be interpreted. Preliminary comparisons from a subset of this sample revealed that: Age: The Kruskal-Wallis test for age comparison was statistically significant ($p=0.0227$) at the 95% confidence interval; Diet on admission: statistical significance ($p=0.0354$) at the 95% confidence interval; patients not consulted showed a significantly less restrictive diet as compared to group 1. Length of stay: not statistically significant ($p=0.1611$) at the 95% confidence interval; diet upon discharge: not statistically significant. Comorbid conditions to be analyzed.  

Conclusions: As this preliminary analysis, age and diet on admission demonstrate statistical significance between groups. No statistical significance noted for length of stay. Comorbidities are currently being investigated. Overall results should serve to improve accuracy of physician referrals for this population.

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**PPP.3 CARE OF DYSPHAGIA PATIENTS AT A HOSPITAL IN MEDIUM AND LONG STAY**  
M. I. Ferrero Lopez; S. Herreaz Moral Hospital Pare Jofre, Spain  
Introduction: Dysphagia is a prevalent symptom of chronic care hospitals and long–stay (HACLE). Previous reviews have shown prevalence between 30-42% (2008–2012), it has been increasing as the protocol of attention to it consolidates. In our environment, dysphagia is detected by the presence of signs and symptoms, and is confirmed by the clinical method Volume–Viscosity (MECV-V). The care given to patients is aimed at improving safety and efficiency of swallowing and the goal is to describe the nutritional, speech therapy and general cares carried out. Methodology: descriptive, cross–sectional study of all patients admitted to the HACLE in 2012 who were referred for evaluation of dysphagia. RESULTS: Sample of 331 patients of which 273 were with dysphagia after MECVV (82.5%). Mean age 76.2 years. Males 57.9%, primary disease: Cerebrovascular Accident (CVA) 26%, cancer 25%, 18% dementias, chronic diseases 20% and others 11%. Charlson Index Average: 3.73 points, absence of cognitive damage: 21%. Die during stay: 49%. Without maalnutrition when hospitalized 1.8% ($n = 74$). In the MECV-V: 83% efficiency and 79.5% safety agreement. Interventions: oral intake was dismissed at 5.5%, more advised: average volume (68%) and viscosity pudding (28%). Nutritional Supplements: 59%, Logoterapia 14.7% and electrostimulation was used at 9.2%. Discharge are revalued 9%, of them improve or maintain result in MECV-V: 94.7%. Those who follow treatment with a speech therapist and those who have ee die less during stay ($p <0.001$). Those who die have greater comorbidity ($p <0.001$) and lower levels of albumin ($p = 0.005$). Conclusions: Interventions in patients with dysphagia in HACLE are based on dietary guidelines set by the outcome of MECV-V. The prognosis of following speech therapy is better and the nutritional status and comorbidity influence in it.
PPP.6 OROPHARYNGEAL DYSPHAGIA IN ELDERLY PATIENTS WITH COMMUNITY-ACQUIRED PNEUMONIA
E.H. Azana Fernandez; Y.R. Davila Barboza / Hospital San Juan de Dios, Leon, Spain
Introduction: Oropharyngeal dysphagia (OD) is highly prevalent in elderly patients. OD is associated with nutritional deficits and community-acquired pneumonia (CAP). Objectives: Assess the prevalence of dysphagia among inpatient patients with CAP. Methods: We conducted a observational study on CAP patients consecutively admitted to a Geriatric Department over 6 months. OD was clinically assessed using the Volume-Viscosity Swallow Test (V-VST). Results: 72 patients (77.6% women), mean age 86.2±4.3 years. The specific clinical history detected previous oropharyngeal dysphagia in 16 patients (22.2%). The V-VST detected oropharyngeal dysphagia in 35 patients (48.6%). Of them, 27 patients (74.2%) had mixed swallowing disorder, 3 (8.6%) had isolated efficacy disorder, and 6 (17.1%) had isolated safety disorder. Those patients with a positive dysphagia test had a statistically significant higher prevalence of cognitive disorder, higher age, more positive history of previous dysphagia and lower functional status. Conclusions: OD is a highly prevalent clinical finding in elderly patients with pneumonia. Screening test to detect dysphagia should be performed in these group of patients.

PPP.7 ORAL HYGIENE AND PNEUMONIA IN THE ELDERLY -- REVIEW OF THE LITERATURE WITH RECOMMENDATIONS FOR SLT PRACTICE
C. Healy; A. McCurtin / University of Limerick, Ireland
Introduction: International research notes that approximately 10% of deaths from healthcare associated pneumonia among nursing home elderly could be prevented by improving oral hygiene practices. Global studies however reflect that such oral healthcare is commonly neglected and often not adequately addressed in personal hygiene protocols. This study carried out a literature review to identify the negative health impacts of poor oral hygiene on dependent elderly. It examines the impact of ageing on the oral cavity and respiratory system and the relationship between poor oral hygiene and risk for the development of aspiration. Methods: A thorough review of the literature used search terms and electronic databases and hand-searching of reference lists. Results: The findings reflect the detrimental impact of poor oral hygiene on health and well-being of elders. There are strong associations between poor oral hygiene and the development and exacerbation of systemic conditions such as cardiovascular disease, pulmonary disease, and endocarditis. Appropriate oral hygiene need not be complex or expensive yet the literature highlights the knowledge, patient, and system barriers that interfere with the implementation of this essential intervention. The management of oral health problems of the elderly requires a multidimensional and multidisciplinary approach. The speech and language therapist (SLT) is in a unique position with skills in the area of communication, dysphagia and knowledge of oral cavity anatomy and physiology. This study highlights the strategic role that the SLT can play in ensuring the identification of oral hygiene issues and provide effective recommendations for practice for healthcare staff. Conclusion: It is essential that the implementation of quality oral care is considered an essential medical intervention rather than merely a comfort measure. Changes in practice can reduce the risks of aspiration pneumonia and improve quality of life.

PPP.9 OROPHARYNGEAL DYSPHAGIA IN ELDERLY PATIENTS WITH CHRONIC OBSTRUCTIVE PULMONARY DISEASE
E.H. Azana Fernandez; Y.R. Davila Barboza/ Hospital San Juan de Dios, Leon, Spain
Introduction: Some authors reported a higher prevalence of Oropharyngeal dysphagia (OD) in individuals with chronic obstructive pulmonary disease (COPD) than in controls. The cause is believed to lie in the intricate coordination of swallowing and breathing. Objectives: Assess the prevalence of dysphagia in patients with COPD. Methods: We conducted a observational study on COPD patients consecutively admitted to a Geriatric Department over 6 months. OD was clinically assessed using the Volume-Viscosity Swallow Test (V-VST). Results: 62 patients were included, mean patient age was 85.1±3.8 years. 69.35% were female. 9 patients required long-term oxygen therapy (very severe COPD). The V-VST detected oropharyngeal dysphagia in 20 patients (32.26%). Of them, 14 patients (70.0%) had mixed swallowing disorder, 5 (25%) had isolated efficacy disorder, and 1 (5%) had isolated safety disorder. 11 patients (55%) had safe swallow at nectar; 5 (25%) at liquid, and 4 (20%) at pudding viscosity. Conclusion: Prevalence of OD is very high in COPD patients. Screening test to detect dysphagia should be performed in these group of patients.
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PPP.8 ACCEPTABILITY OF ORAL SOLID MEDICINES IN OLDER ADULTS WITH AND WITHOUT DYSPHAGIA: A PROSPECTIVE OBSERVATIONAL STUDY

A. Ghauffr1; J. Bains1; S. Hamdy2; F. Liu3 1University of Hertfordshire, United Kingdom; 2University of Manchester, United Kingdom

Introduction: Dysphagia is common in older people which is likely to affect their ability to take oral medicines. Their acceptance to medicines are critical in ensuring compliance and therapeutic outcomes. The aims of this research are to assess patient acceptability to solid oral medicines and to evaluate the association between patient acceptability and swallowing difficulties. Materials and methods: The study was conducted in community pharmacies in the South East England during October to November 2014. Participants aged ≥65 years answered two questionnaires, the Sydney Swallow Questionnaire (SSQ) and the Medicines Acceptability Questionnaire (MAQ). The SSQ is validated assessing swallowing ability using visual analogue scales; a score ≥ 200 indicates the presence of dysphagia. The MAQ assesses the acceptability of oral solid dosage forms using a 0 to 10 ranking scale (higher score indicating better acceptance). The participants also evaluated the size and shape of tablets which might cause difficulty in swallowing. Results and discussion: 156 participants were recruited (mean age 74 range 65–93). 17 (11%) participants had a SSQ score ≥200, indicating symptoms of dysphagia. The MAQ assesses the acceptability of oral solid dosage forms using a 0 to 10 ranking scale (higher score indicating better acceptance). The participants also evaluated the size and shape of tablets which might cause difficulty in swallowing. Results and discussion: 156 participants were recruited (mean age 74 range 65–93). 17 (11%) participants had a SSQ score ≥200, indicating symptoms of dysphagia. The MAQ assesses the acceptability of oral solid dosage forms using a 0 to 10 ranking scale (higher score indicating better acceptance). The participants also evaluated the size and shape of tablets which might cause difficulty in swallowing. Results and discussion: 156 participants were recruited (mean age 74 range 65–93). 17 (11%) participants had a SSQ score ≥200, indicating symptoms of dysphagia. The MAQ assesses the acceptability of oral solid dosage forms using a 0 to 10 ranking scale (higher score indicating better acceptance).

PPP.9 SWALLOWING FREQUENCY IN ELDERLY DURING RESTING AT NIGHT

N. Kaneko1; K. Nohara1; N. Tanaka1; K. Okuno2; M. Mitsuyama1; T. Sakai1 1Osaka University Dental Hospital, Japan; 2Faculty of Dentistry, The University of British Columbia, Canada

Purpose: One of the causes of aspiration pneumonia in the elderly is saliva aspiration while asleep at night. In addition to saliva, the aspiration of refluxed contents due to GERD while asleep has also been indicated in some reports as a possible cause of pneumonia in elderly. The inflow in pharynx contents that enter the pharynx are swallowed. Due to decrease in the frequency of swallowing, which is responsible for pharyngeal clearance, therefore, more aspiration might occur, thereby increasing the risk for the development of aspiration pneumonia. However, there have been no reports of measurement of swallowing frequency in the elderly during at night, which remains unclear. This study examined the swallowing frequency in the elderly residents of a nursing homes, and compared the findings with those in healthy young subjects and the differences during resting at night. Method(s): Subjects were 13 elderly residents of a nursing home (Group E; mean age ~84.2). This study examined the swallowing frequency using a portable device capable of long-term operation and compared the findings. Measurement conditions were set to 4 hours of being placed at bed rest during the night rather than electroencephalogram recording, since nocturnal awakening frequently occurs in the elderly, and the result was compared with that of eight healthy young (Group N; mean age=31.3). Result(s): The mean swallowing frequency of the group E (7.0±3.3 times/h) was significantly higher than that of the group N (4.3±2.8 times/h). Conclusions: Because one of the causes of aspiration pneumonia in the elderly residents of a nursing homes is aspiration while asleep at night, it occurred significantly more frequently than healthy young while swallowing frequency during resting at night appeared to be decreased. These results might suggest involvement of that the sleep depth and GERD.

PPP.10 DRUGS ASSOCIATED WITH OROPHARYNGEAL DYSPHAGIA IN OLDER PEOPLE

M. Miarons1; L. Campins2; E. Palomera2; M. Serra-Prat2; M. Cabré2; L. Rofes/S Hospital de Mataró, Spain

Introduction: Some drugs, especially those acting on the central nervous system, may increase the risk of oropharyngeal dysphagia (OD) in older people. The aim of this study was to evaluate the relationship between OD and chronic exposure to drugs in older patients admitted to an acute geriatric unit (AGU) of a secondary hospital. MATERIAL AND METHODS We performed a retrospective cohort study of 966 patients consecutively admitted to the AGU from January 2008 until December 2011. We reviewed: a) the diagnosis of OD (assessed with the volume-viscosity swallowing test (V-VST), a bedside method; b) chronic patient medication (classified by ATC codes) with Bussiness Intelligence (BI) program three months before admission and c) demographic characteristics and clinical data. A univariate analysis was performed as a first step, to determine which medications were associated with OD. A multivariate analysis adjusting for confounding clinical factors will be performed as a second step, to identify which of those medications were independently associated with OD. Results: The average age of patients included was 84.6 ± 6.28 years and 59.4% were women. A total of 41.9% were diagnosed with OD. Demographic and clinical characteristics of the studied population are presented in Table 1. Drugs associated with dysphagia were: antipsychotics (OR 1.933, 95%CI 1.270–2.942), antidepressants (OR 1.440, 95%CI 1.086–1.910) and antide- mentia drugs (OR 2.725, 95%CI 1.465–5.070). Drugs with a protective effect on OD were: beta
DYSPHAGIA TREATED WITH RADIOTHERAPY (RT): CASE REPORT

The aim of this study is to describe the efficacy of swallowing therapy in patients with late dysphagia. To date, no research about the efficacy of swallowing therapy in patients with late dysphagia treated with drugs that can worsen their swallowing function and to further investigate new therapeutic targets and mechanisms of action to improve swallowing in older patients. The patient performed intensive swallowing exercises (effortful swallow for hard masticated consistencies until 9 years after finishing RT). The patient, who presented no pharyngeal dysphagia on the right tonsil (T4aN1M0), who presented no pharyngeal dysphagia on the right tonsil (T4aN1M0), has no impact on the physiological swallowing function. Despite the remaining of swallowing difficulties the patient experiences a better participation in daily life and a better quality of life after swallowing therapy.

PPQ.1 FUNCTIONAL APPLICATION OF THE EFFORTFUL SWALLOW MANOEUVRE IN A HEAD AND NECK CANCER (HNC) PATIENT WITH LATE DYSPHAGIA TREATED WITH RADIOTHERAPY (RT): CASE REPORT

J. Oorts1; E. Oorts2; A.S. Beeckman1

1Postgraduate Dysphagia, Artvelde University College, Belgium; 2Antwerp University Hospital, Belgium

Introduction: Among HNC survivors treated with RT some patients began having severe swallowing problems which do not occur until 5 or more years post-treatment (late dysphagia). To date, no research about the efficacy of swallowing therapy in patients with late dysphagia is done. The aim of this study is to describe the effects of intensive swallowing therapy on swallowing in a HNC patient with late dysphagia treated with RT.

Materials & Methods: We present the case of a 76 year old man, with diagnosis of a well differentiated spinocellular oro-pharynx carcinoma, on the right tonsil (T4aN1MO), who presented no pharyngeal dysphagia for hard masticated consistencies until 9 years after finishing RT. The patient performed intensive swallowing exercises (effortful swallow manoeuvre) based on the principles of Strength Training. Assessment of functional changes was carried out after 10 weeks with multidimensional outcome-measures (swallowing severity scales, MASA-C, VFES, DSWAL-QOL). Results: There was no difference between the pretreatment and post-treatment severity scores on the level of impairment and activity. Nevertheless, on the level of participation an improvement was seen. Similarly there was no difference between the pre- and post-treatment MASA-C scores. The VFES-findings confirm that there was no physiological improvement of bolus transport over time. Given that no improvement in swallowing function occurred, an improvement on the DSWAL-QOL was observed specifically on the subscales eating duration, eating desire, food selection, symptoms, social functioning and fatigue. Conclusions: The results of the study suggest that intensive swallowing therapy initiated more than 9 years after finishing RT has no impact on the physiological swallowing function. Despite the remaining of swallowing difficulties the patient experiences a better participation in daily life and a better quality of life after swallowing therapy.

PPQ.2 PSYCHOMETRIC VALIDATION OF A SWALLOWING-RELATED QUALITY-OF-LIFE QUESTIONNAIRE: HEAD AND NECK CANCER SURVIVORS’ ASSESSMENT OF MEALTIMES (HN-SAM)

M.K.K. Chan1; Y.L. Siu1; K.W. Chan1; D. Pu1; K.Y. Cheng1; V.H.F. Lee1; J.W.Y. Chan1; R. Nund2; E. Ward2

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Background: Studies have shown that swallowing problems, a common chronic issue after radiotherapy, have negative impact on head-and-neck cancer survivors’ quality of life. The proposed swallowing-related quality of life questionnaire (HN-SAM) was developed from the perspective of the survivors and based on the International Classification of Functioning, Disability and Health (ICF) framework. The current study aimed to validate the questionnaire with HNC survivors. Methods: The HN-SAM is a 35-items questionnaire divided into four sections, including: 1) current diet and health; 2) body functions and structures; 3) activities and participation; and 4) environmental factors. Eight speech therapists rated the clinical relevance of the items. 122 HNC survivors, who have completed their cancer treatment for 6 months or more, completed HN-SAM and MDADI independently. Their swallowing functions were clinically assessed and rated based on the Functional Oral Intake Scale (FOIS). Results: Strong internal consistency and good test-retest reliability were found. The HN-SAM scores were moderately negatively correlated with the FOIS ratings and MDADI scores. Significant differences were found in the HN-SAM scores between dysphagic and non-dysphagic participants. Conclusions: HN-SAM is an ICF-based swallowing-related quality of life questionnaire. Good content, criterion, construct and clinical validity were established in the current study. It is proposed that HN-SAM be tested in more languages and countries for further validation. Acknowledgements: The project was partially funded by the Seed Funding Programme for Basic Research, University of Hong Kong.

PPQ.3 DYSPHAGIA, OTHER FUNCTIONAL DISORDERS AND INTERVENTIONS TO IMPROVE THE SYMPTOMS 6-12 MONTHS AFTER HEAD AND NECK CANCER TREATMENT. SYSTEMATIC REVIEW OF SYSTEMATIC REVIEWS

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Introduction: Head and neck cancer and its treatment results in considerable symptoms and quality of life after-effects. Aim of our group is to develop an evidence-based intervention system to alleviate disability from and improve sequelae of cancer and its treatment together with the quality of life of patients with head and neck cancer. Through systematic reviews of the published systematic reviews we identify current interventions for alleviating these symptoms. Material & Methods: We searched databases for systematic reviews in population of head and neck cancer. Supplementary search was not restricted to population. We mapped symptoms present after treatment, together with used interventions. Results: We present the results of systematic review of systematic reviews showing identified symptoms including dysphagia in the late
stage of the head and neck cancer treatment. We also present list of interventions being used to alleviate these symptoms. Areas of potential further research are also identified. Conclusions This work presents current evidence in respect to late symptoms after head and neck cancer treatment and the interventions being used.

PPQ.4 AN UNUSUAL CASE-SWALLOWING DIFFICULTY AFTER BILATERAL STERNOCLEIDOMASTOID MUSCLE EXCISION: A CASE REPORT
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Introduction: Neck biomechanical characteristics are important for swallowing function. Sternoclidomastoid muscle (SCM) plays a key role in neck biomechanics to support head movements and cervical column (1). Case: 65 years old male subject underwent bilateral torticolis surgery in 1984. Secondary to SCM excision, cervical kyphosis and C3-6 osteophytic formations were observed in computerized neck tomography results. Neck flexion was 35°, neck extension was 20°, right and left lateral flexion were 30°, right rotation was 20° and left rotation was 250 according to range of motion analysis. He coughs during liquid swallowing but had no aspiration pneumonia story. But he lost 7 kilograms in last 6 months. Penetration was determined in fiberoptic endoscopic swallowing study. Score of Penetration Aspiration Scale was 5 points. He was included in swallowing rehabilitation (three days/ a week) for 4 weeks. Electric stimulation to suprahidoid muscles, oral thermal tactile stimulation, exercises to correct neck biomechanics and increase laryngeal elevation were applied. There was no cough during swallowing after 4 weeks. Score of Penetration Aspiration Scale was 2 points and he gained 4 kilograms. Discussion: Sternoclidomastoid muscle plays a key role in neck biomechanics and so it is also related to swallowing function. Due to its effect on neck biomechanics, sternoclidomastoidus muscle excision effected swallowing function negatively. This case study showed that if the problems is determined and the proper approaches is applied, swallowing problems will be minimized.

PPQ.5 SWALLOWING HANDICAP INDEX IN PATIENTS TREATED FOR HEAD AND NECK CANCER
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Introduction: The evaluation of quality of life (QOL) related to swallowing and speech functions is critical for rehabilitation in patients with oral cavity and oropharynx cancer. The purpose of this study was to evaluate QOL related to dysphagia in head and neck cancer patients with the Dysphagia Handicap Index (DHI). Material and Methods: Transversal study, including patients treated for head and neck cancer, independent of tumor site and stage of the head and neck cancer treatment. They answered three questionnaires: DHI, SWAL-QOL and SF36. Results: We evaluated 80 patients, 72.5% male, mean age of 58 years. Oral cavity was the most frequent tumor site (61.2%), 31.2% of patients had advanced tumors and 47.5% were submitted to combined treatment. DHI presented significant correlations with SWAL-QOL and SF36 (worse QOL related to swallowing, worse QOL general scores). Patients submitted to swallowing rehabilitation (56.25%) showed better results on DHI. A total score average of 42.5 was observed, with higher scores for advanced ages (=>60 years), males, advanced T stage, positive lymph nodes, low education, combined treatment and neck dissection, even tough without significance. Conclusions: The DHI on patients treated for head and neck cancer demonstrate a limitation of 42.5 on total score, considered a minimum limitation on QOL.

PPQ.6 QUALITY OF LIFE BEFORE AND AFTER HEAD AND NECK CANCER
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1AC Camargo Cancer Center, Brazil
Introduction: Alterations on breathing or swallowing on dysphagic patients treated for head and neck cancer can bring undesirable psychosocial consequences, leading to impacts on quality of life (QoL), depending on the personal representation and the familiar or professional interaction necessity. The purpose of this study was to evaluate QoL on head and neck cancer patients before and after three time points after treatment. Material and Methods: It was a prospective study, with patients diagnosed with oral, pharyngeal or laryngeal cancer, from February 2012 through May 2014, independently of age and gender. Patients were submitted to general and symptoms-specific (breathing and swallowing) QoL questionnaires applications (UW-QOL -- University of Washington Quality of life Questionnaire; SGRQ -- St. George’s Respiratory Questionnaire; MDADI -- The MD Anderson Dysphagia Inventory). The evaluations were done in 4 time points: before and 1-3 months, 6-9 months and 12-18 months after treatment. Results: We included 38 patients according to inclusion criteria, most were man (28 -- 73.7%) with mean age of 60 years (27-85 years). Aspiration pneumonia was diagnosed in four patients (10.5%) and changes on QOL related to cancer, breathing and swallowing were observed. On UW-QOL we saw significant worse results on appearance, taste, speech and saliva domains and on the total score after treatment, with better results for anxiety domain after 12 months of treatment. On the SGRQ, significative changes were observed on symptoms domain during the evaluations. On the MDADI, significative changes on swallowing specific QOL were observed with worse results on functional, physics and total domains after 1-3 months after treatment, when compared to the baseline evaluation. Conclusion: Specific QOL changes on cancer disease, breathing and swallowing were observed after treatment.
PPQ.7 SWALLOWING PROBLEMS AFTER PARTIAL LARYNGECTOMY
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Introduction. Surgery is used for treatment of advanced laryngeal and hypopharyngeal cancer in a considerable number of patients. In order to preserve the patient’s ability of laryngeal speech, different modes of partial laryngectomy and pharyngectomy are used. Such an anatomical change at the crossing of the respiratory and alimentary tract can cause dysphagia, aspiration and pneumonia. The aim of the study was to find out what are the factors that are connected with successful swallowing after partial laryngectomy. Methods. All patients who underwent partial laryngectomy because of laryngeal or hypopharyngeal cancer in the period 2012-2014 at our department were included. The data on localization, extent of the disease, preservation of the epiglottis, mobility of vocal folds, pre- or postsurgical irradiation and chemotherapy, and swallowing evaluation after surgery were obtained from the medical documentation. The patients with only minor or without swallowing problems were compared to the patients with swallowing problems. Results. Twenty-three patients (21 men, 2 women) were included in the study. The most important factors connected with successful swallowing after surgical treatment were the preservation and the correct position of the epiglottis, no pre- or post-surgery irradiation, possibility of the complete closure of the entrance of the remnant of the larynx, no defect of the base of the tongue, normal function of the oral phase of swallowing and early swallowing evaluation after surgery for planning of the swallowing rehabilitation. Conclusions. For a successful swallowing after partial laryngectomy the preserved anatomy of the base of the tongue and normal oral phase of swallowing are necessary. Early fiberendoscopic evaluation of swallowing with the study of compensatory maneuvers (position of the head, chin, texture of food) contributes to early oral feeding and shortens stay in hospital after surgical treatment.

PPQ.8 SELF REPORTED DYSPHAGIA IN PATIENTS AFTER TOTAL LARYNGECTOMY
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Introduction: The standard of care for the treatment of advanced laryngeal carcinoma has shifted over the past several decades, as organ preservation has become the preferred alternative to ablative surgical procedures for cases in which survival is considered comparable. Nevertheless, total laryngectomy is still a commonly performed surgical procedure either after failure of chemo-radiation or as an initial treatment for very advanced cases. Even after the total segregation of the deglutition passages with the airway, swallowing difficulties do exist in a number of patients affecting their quality of life. Materials/Methods 52 patients that underwent total laryngectomy during the past six years were included in the study. A dysphagia related quality of life questionnaire (EAT 10) was administered to them. The answers were analyzed and correlated with other treatment modalities prior or after surgery. Results Of the patients 46 were male and 6 female. 40 patients returned the questionnaires (6 females and 34 males). Mean EAT 10 score was 5.22 patients (55%) reported an EAT 10 equal or more than 3. These were male 50% and female 66.7%. Most of the patients with reported dysphagia (73%) had received pre-or post-surgery radiotherapy, with most of them (45%) having been subjected to chemo-radiation therapy compared to 27% that were only treated with radiotherapy. Only 27% of the patients with dysphagia were only treated by surgery. Conclusion Total laryngectomy patients report swallowing difficultes affecting their quality of life, despite the avoidance of aspiration pneumonia that is achieved. Dysphagia is reported predominately by patients treated with radiation therapy in addition to surgery. More research and treatment options should focus in improving the quality of life of these patients.

PPQ.9 FUNCTIONAL ASSESSMENT OF RECONSTRUCTION AFTER ANTERIOR ORAL CAVITY CANCER
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Introduction: Cancer of anterior oral cavity leads to speech and swallowing difficulties. The aim of this study is to propose a assessment to measure the functional outcomes after the treatment of these cancers. Methods A set of measurements was selected covering tongue dynamic (elevation, protration and backward during video fluoroscopic swallowing assessment (VFS)), swallowing function (Specific related quality of life questionnaire, F0IS, PAS and NIHSS determined during VFS), speech function (Specific related quality of life questionnaire, Intelligibility tests, Nasality and quality of life questionnaires). This set was performed by 17 patients at least 2 years after the end of the treatment. The description of the data, the correlation between the measures and the differences observed according to the size of the tumour and the kind of reconstruction gave some arguments for the final proposal. Results The whole measures were possible. The distribution of the result is not available for two parameters : elevation of the tongue, global intelligibility. The correlations between the quality of life questionnaires (generic and specific for swallowing and speech) are high (0.85 and 0.81 respectively). The correlation between the tongue dynamic measures and respectively swallowing and speech measurements are moderate at -0.55 with the NIHSS and 0.49 with the phonetic intelligibility test. The correlation with the specific quality of life questionnaires are moderate except for the phonetic intelligibility test and the swallowing questionnaire with a value of 0.7. This result was followed but a complete analysis of the correlations between speech and swallowing measurements. Only measurement at a phonetic level are highly correlated. Conclusions There is a high correlation between phonetic production disorders and swallowing impact on patient life in cancer of anterior oral cavity. The search of more specific links could lead to simplify the outcome assessment.
Abstract Book

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PPR.1 "IT’S REALLY VERY DISTURBING TO ME" - THE SOCIAL REALITY AND REAL LIFE CHALLENGES FOR INDIVIDUALS LIVING WITH ORO-PHARYNGEAL DYSPHAGIA
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Introduction: A paucity of literature exists documenting the psychosocial experience of living with oro-pharyngeal dysphagia, yet impairment-based management fails to meet the requirements of this clinical population. By exploring individuals’ experience of oro-pharyngeal dysphagia, one can gain insight into patient’s perspectives and attitudes regarding swallowing and feeding difficulties, in an effort to identify their real-life challenges.

Materials & Methods: A qualitative-descriptive research design was carried out using an interpretative phenomenological approach (IPA) to analyse data drawn from eight purposively chosen, first person, personal accounts of adult’s living with oro-pharyngeal dysphagia. Data files were consecutively recruited from carefully-situated, available internet files, and were transcribed verbatim. Results: Textual and interpretative analyses revealed twelve emergent themes, which further generated four superordinate themes- 1) Life changes, 2) Emotional Upheaval, 3) Professional & Familial involvement, and 4) Hope & Healing. While many emerging themes were consistent across cases, a small number of emerging themes were unique to their individual case. Thus, as each case was examined in detail, diverging and converging themes were identified. Conclusion: The superordinate themes identified are non-exclusive to individual’s presenting with oro-pharyngeal dysphagia, but reflect experiences of many individuals living with an illness. Thus, assessment and management of dysphagia must be sufficiently holistic to address both the changing physical states and the psychosocial needs of individuals with oro-pharyngeal dysphagia. Focusing only on impairment-based management will fail to fully meet the support needs of this clinical population.

PPR.2 DIRECT SWALLOWING THERAPY AND BRAIN PLASTICITY IN THE RECOVERY OF SWALLOWING FUNCTION IN POST-STROKE PATIENTS WITH DYSPHAGIA
A. Aldurabi1; King Fahad Medical City, Saudi Arabia

Introduction: Swallowing difficulties occur in more than a third of patients with stroke admitted to rehabilitation. Over the past decade, studies have revealed that brain plasticity - the capacity of brain cells or neurons and neural networks in the brain to change their connections and behavior in response to new information, sensory stimulation, development or damage - plays a role in spontaneous resolution of dysphagia after stroke. Understanding the effect of neural changes in relation to swallowing function would help explain and predict the nature of the dysphagia, the most appropriate therapy that could be used to treat it and in predicting recovery following injury. Methods: This paper will analyze studies on neuroplasticity and dysphagia treatment to provide as much evidence as possible for speech pathology clinicians in terms of the most effective swallowing therapy for post-stroke patients. Conclusions: Based on this analysis of the latest evidence in the dysphagia literature on neuroplasticity and swallowing rehabilitation, direct therapy techniques using different tastes and sizes of boluses of nectar thick liquids, combined with forms of indirect therapy (i.e. strengthening and ROM exercises) are emerging as the most effective and harmless parameters to manipulate in order to encourage brain plasticity in support of faster recovering of swallowing function in stroke patients. Several studies reviewed the effect of the electrical stimulation on swallowing rehabilitation. They found that under certain circumstances, electrical stimulation could improve the swallowing mechanism. However, it has potential side effects, which makes it less preferable and would be considered unethical in clinical practice due to the lack of good evidence on their long-term effects on swallowing. Finally, neurotrophic and pharcotherapy interventions are in their early stages of investigation in animals, their benefits as a treatment for dysphagia are not yet known.

PPR.3 CHARACTERIZATION OF RISK GROUPS FOR SWALLOWING DISORDERS IN THE INTENSIVE CARE UNIT
B.S. Abarzúa1; A. Rockland2; W. Nascimento3; F.S. Soria4; A.C.A. Ghirardi1; A.M. Ferkim1; 1Universidade Federal de Santa Catarina, Brazil; 2EPAP, Portugal; 3Universidade de Sao Paulo, Brazil; 4Faculdade Assis Gurgacz, Brazil

Introduction: Dysphagia is a symptom of an underlying disease leading to swallowing disorders causing among its main symptoms difficulties in initiating swallowing, coughing or gagging when swallowing and sensation of food stuck in the throat. Its consequences are malnutrition, dehydration, and penetration/aspiration as well as aspiration pneumonia. The purpose of this study is to identify the profile of patients at risk for oropharyngeal dysphagia considering a screening instrument filled out while studying medical records and a brief close-ended interview concerning patients in the Intensive Care Unit of the HU - UFSC. Methods: This is a prospective, cross-sectional study with a quantitative analysis of the results, conducted with the patients at the Intensive Care Unit of the Polydoro Ernani de São Thiago University Hospital (HU/ UFSC/ SC/ Brazil). Results: There was significant difference when comparing the difference in percentage among the groups of patients with tracheostomy, with respiratory support, use of long-term ventilation evolving towards clinical signs of aspiration, cognition impairment, lack of attention, does not follow verbal orders and mental confusion. These groups had swallowing complaints, medical restraints of oral diet or diet changes due to difficulties in specific consistencies, which may suggest disorders in swallowing biomechanics. Conclusion: The most common risk groups were neurological disorders, cardiac problems, chronic obstructive pulmonary disease, diabetes mellitus, asthma, conscience impairment/mental confusion, pneumonia and ventilation dependency. The instrument was powerful enough to exclude the patients with no risk of swallowing disorder or dysphagia, but not the opposite.
**PPR.4 EFFECT OF CHRONIC PULMONARY DISEASES ON SWALLOWING FUNCTION: SYSTEMATIC REVIEW**

I Ghanouchi1; R. Speyer2; E. Verin3; Farhat Hached Sousse Hospital, Tunisia; James Cook University, Australia; Rouen University, France

Introduction: The precise coordination of breathing and swallowing might be an important mechanism to prevent pulmonary aspiration. Factors that alter the breathing pattern and ventilation such as chronic pulmonary diseases may influence this coordination of breathing and swallowing. The aim of this review was to evaluate the relationship between dysphagia and chronic pulmonary diseases. Methods: The systematic search was performed by two independent abstract reviewers using the electronic database Pubmed and Embase. All articles with available inclusions up to August 2014 were included. Results: A total of 22 articles were included in this review: nine studies dealt with obstructive sleep apnea syndrome (OSA) and thirteen studies described swallowing function in chronic obstructive pulmonary disease (COPD). Conclusions: Even though statistical pooling of data was not possible due to the heterogeneity in subject characteristics and applied assessment methods, all studies concluded that chronic pulmonary diseases altered the swallowing function and increased the risk of dysphagia. More research is needed to retrieve prevalence data and gain a better understanding of the relationship between dysphagia and chronic pulmonary diseases.

**PPR.5 COMPARISON OF TONGUE COATING-REMOVING EFFECT BETWEEN PROTEASE-CONTAINING ROUGH TABLETS AND TONGUE BRUSH**

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Objective: Oral cleaning, including removal of the tongue coating, has recently been recognized as effective to prevent aspiration pneumonia. In the elderly, the tongue coating thickens and becomes difficult to remove due to reduction of the saliva volume. We compared the coating-removing effect between tablets containing protease, and a tongue brush in elderly subjects requiring care and healthy young subjects.

Methods: The subjects were 10 healthy young adults and 10 elderly subjects requiring care. A cross-over study was performed. Cleaning was performed using only 2 protease-containing rough-surface tablets, only a tongue brush, or both the tablets and brush. Samples were collected from the dorsum of the tongue and photographs were taken immediately before intervention and immediately and 1 and 2 hours after cleaning. The number of bacteria was measured in the samples using a bacterial counter. The dorsum of the tongue was divided into 4 regions, and the area and thickness of the tongue coating were evaluated using 4-step scoring to determine the amount of coating adhering to the tongue. The number of bacteria and amount of coating were investigated in each subject group. Results and Discussion: The number of bacteria in the tongue coating was most significantly decreased by the combination of the tablets and brush in both groups, but the number in the elderly subjects requiring care markedly increased after cleaning using the tongue brush compared to that in the healthy young subjects, although it transiently decreased after the use of the tablets to a level similar to that in the healthy young subjects. In contrast, the amount of coating adhering to the tongue continuously decreased in both groups, clarifying that, although the tongue coating was removed on visual observation, bacteria in the deep region of the dorsum of the tongue were dislodged on tongue brushing, and the amount of coating is large in elderly subjects requiring care.

**PPR.6 2–3 DAY EVALUATION AND MANAGEMENT PROGRAM FOR CHILDREN AND ADULTS WITH OROPHARYNGEAL DYSPHAGIA**

M. Rivelsrud1; P.A. Tupala2; E.A. Kjoelberg1/ Sunnaas Rehabilitation Hospital, Norway; Sunnaas Rehabilitation Hospital, Norway

Introduction: Sunnaas Rehabilitation Hospital is the only hospital in Norway offering a 2–3 day evaluation and management program for adults and children with oropharyngeal dysphagia. We do not have research results to present, however, we believe our program can be considered unique in the field of dysphagia and therefore to be of clinical interest. Materials & Methods All patients are referred from their primary physician or a physician specialist. The patient and caregivers receive a questionnaire to be filled out and returned before admission. Children stay for 2 and adults for 3 days. Parents and caregivers follow the patient during the program. A review of admissions from 01.01.13 until 31.12.14 showed that there were 106 adults and 57 children admitted to the program. Adults age ranged 18–86, with a mean of 54 years. Children were 11 months–17 years, with a mean of 6 years 8 months. Primary diagnosis for children was cerebral palsy or other congenital syndromes/disorders. Adults were primarily CVA and head/neck cancer. The interdisciplinary team includes a physical and rehabilitation specialist, nurse and speech language therapist. Occupational- and physiotherapist, psychologist and social worker are included when necessary. Conclusion: The Sunnaas dysphagia evaluation and management program is unique because it focuses only in oropharyngeal dysphagia, thus acknowledging dysphagia as a real disorder both for the patients, caregivers and health professionals. Education is the second essential part of the program and is crucial in helping parents, patients and caregivers make informed decisions regarding their health and quality of life. The third important aspect of the program is the participation of local interdisciplinary team to ensure effective and consistent transferal of information both to the patient, relatives and caregivers, whether they work with the patient at day-care, school, institution or as home-based care.

**PPR.7 PRELIMINARY EFFICACY OF DONEPEZIL FOR THE TREATMENT OF PROFOUND OROPHARYNGEAL DYSPHAGIA**

P.C. Belafsky; M.T. Siddiqui/ UC Davis, United States

Background: Oropharyngeal dysphagia (OPD) is common, morbid and costly. Treatment options for patients that fail conservative management are limited. Acetylcholine is a central and peripherally acting neurotransmitter that is responsible for excitation at the neuromuscular junction. We hypothesized that the centrally acting cholinergic medication donepezil may be effective in improving swallowing function in select patients with profound OPD. The purpose of this investigation was to evaluate improvement in swallowing function after 4 weeks of donepezil treatment. Study Design: Retrospective case series. Methods: The charts of all persons with...
OPD secondary to pharyngeal and/or lingual weakness who were administered a trial with Donepezil 10.2-20mg/day for 4 weeks were abstracted. Information regarding patient demographics, diagnosis, and pre/post treatment objective measurements on dynamic fluoroscopic swallow study were coded and recorded into a clinical database. The primary outcome measure was the pharyngeal constriction ratio (PCR), a validated surrogate measure of pharyngeal contractility. A higher PCR indicates a weaker pharynx. Secondary outcome measures included hyoid excursion, upper esophageal sphincter (UES) opening, and hypopharyngeal transit time (HPT). Improvements in swallowing function were evaluated pre/post treatment with the paired-samples t-test. Results: 4 patients were administered donepezil. Two patients could not complete the treatment due to self limited side effects (sleep disturbance). The etiology of OPD was stroke (1) and carcinoma of the tongue base (1) and tonsil (1). The mean pharyngeal constriction ratio improved from 0.57 (±0.26) to 0.37 (±0.29) [p < 0.05]. There was so significant change in upper esophageal sphincter opening, hyoid elevation, or hypopharyngeal transit time (p > 0.05). Conclusions: These early data suggest that donepezil may improve swallowing function in persons with profound oropharyngeal dysphagia. The results support the need for a randomized clinical trial.

PPR.8 CLINICAL AND FLUOROSCOPIC ANALYSIS OF SWALLOWING IN PATIENTS WITH A LUMP IN THE THROAT
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Introduction: It is believed that a lump in the throat (LITT) and swallowing dysfunction are not related to each other. The purpose of our study: clinical examination and videofluoroscopy of swallowing (VFS) in patients complaining on an LITT. Material & Methods: 50 patients entered the study. They were examined by gastroenterologist, neurologist, otorlaryngologist, endocrinologist. We used the authorial questionnaire and EAT-10; VFS; esophageal manometry, 24-hour pH monitoring; endoscopy; brain MRI in some cases. Results. The feeling of LITT was transient in 76% and permanent in 24%. The duration of the suffering varied (1-5 years-21.7%, more than 5 years-21.7%). Everyone had shown gastroenterological symptoms, almost 50% - otorlaryngological, 4.3% - neurological, 4.3% - endocrinological. Only 16% of patients showed a normal score on EAT-10. The LITT sense hasn’t been affected by swallowing in 34.9% of cases (group 1). For half of the rest 65.1% (group 2) it has amplified (1A), and for the other half has reduced (1B) during swallowing. Retardation of the swallowing initiation, multiple or sequential swallows and the prevalence of GERD recorded in group 2 more often, disturbance of esophageal clearance — in 1A. Esophageal phase dysfunction was registered in 56% of patients in each group, with the disorders of esophageal clearance in 1A-subgroup occurred significantly more frequently than in 1B. A variety of changes in the pharyngeal phase in all groups (Table 1) is amazing. Conclusions. A normal EAT-10 score was registered only in 14% cases. Swallowing did not influence the intensity of LITT sense in one third of cases. In half of the remaining patients, swallowing strengthened the LITT feeling and diminished it for the other half. At that, esophageal residue in patients complaining on increased LITT during swallowing was met much more often than in the subgroup where swallowing weakened this feeling. Diverse pharyngeal phase changes were found in all groups.

PPR.9 HEALTH-RELATED QUALITY OF LIFE AND OROPHARYNGEAL DYSPHAGIA: A SYSTEMATIC REVIEW
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Introduction: Oropharyngeal dysphagia (OD) may lead to aspiration pneumonia, dehydration and malnutrition. Furthermore, OD has a major impact on Health-Related Quality of Life (HR-QoL). A recent systematic review described the negative impact of increased bolus modification on HRQoL in persons with OD, however, the severity of OD may have been related to the applied level of bolus modification, therefore influencing the findings. The current systematic review aims to examine the impact of OD on the quality of life of persons with dysphagia. Material & Methods: A systematic search of the literature was performed using two electronic databases: Pubmed and Embase. Subject headings (Mesh and Thesaurus) were supplemented by free text words. All available English publications up to May 2015 were included. The abstract selection was conducted by two independent abstract reviewers. Results: A total of 1480 abstracts were retrieved, of which 119 abstracts were accepted for full-text approval. Twelve studies met the inclusion criteria. Overall, all articles indicated at a significant decrease of quality of life for patients with OD compared to persons with less severe OD or no OD. However, as a result of the diverse nature of methodology, terminology and assessment procedures used in the literature, the generalisation of study results is limited. Conclusions: More research is needed on the impact of OD on HR-QoL taking in to consideration the severity of OD and underlying diseases.
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Vanderwegen, J. | OP8A.1, OP8B.5  
Verheugen, J. | OP8A.1, OP8B.5  
Vernon, E. | OP10.3, PPD.1, PPD.2, PPL.7  
Verin, E. | OP10.3, PPD.1, PPD.2, PPL.7  
Vieto-Kohner, T.V. | PPN.6  
Vian, L.A. | PPB.5  
Vielo-Marques, T.Q. | PPB.5  
Vilas-Bôas, T.Q. | PPB.5  
Wagle, B. | PPR.9  
Wahl, C.D. | PPN.7  
Walshe, M. | OP2.1, OP2.6, OP4.7, PPC.3  
Wei, X. | OP10.5  
Weis, G.L. | PPL.1  
Wilson, J. | PPO.3  
Wong, C.S. | OP10.2  
Woods, B.W. | OP2.4  
Wu, P. | OP8A.3  
Yee, C. | PPL.2  
Zardoni, M. | PPN.10  
Zhang, T. | OP8A.3  
Zhao, S. | OP10.5  
Zholtovkin, Y.Z. | PPN.6  
Zlotnik, Y.Z. | PPN.6  

VitalStim™ Therapy System

Uniting the power of electrical stimulation with the benefit of swallowing exercise for dysphagia patients.

We welcome you to have a personal demo at the DJO Global booth #10, and to discover more about the new VitalStim Plus device during the lunch symposium, Thursday 1st October, 13.30-14.00.

www.DJOglobal.eu
Symposium

Managing the patient with dysphagia: From therapeutic strategies to practical solutions

Friday, 2nd October 2015
13:30 – 14:30h,
Room A

Chairperson

Prof. Olle Ekberg, Sweden

MMI - A new concept for dysphagia management

Prof. Pere Clavé, Spain

Nutritional management of dysphagia - practical insights

Dr. Rosa Burgos Peláez, Spain

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