Managing Dysphagia via Telepractice: What's the evidence?

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Web of Science May, 2014
"telehealth or telemedicine"

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A little about you?

• What has been your prior experience with delivering telehealth services
  1. None
  2. Experience using phone for consultation/support
  3. Have used video conferencing with clients
  4. Have used specific designed systems for specialized telehealth services

...and the nature of the clinical services you have delivered via tele?
  1. Speech
  2. Language
  3. Voice
  4. Fluency
  5. Swallowing

• Your years of experience managing patients with dysphagia
  1. 0 - 5 years
  2. 5 - 10 years
  3. Too many to admit too!

• Your interest in today’s webinar?
  1. mainly theoretical - a general interest in telehealth and its use in speech pathology
  2. mainly practical - we wish to begin to use telehealth for dysphagia services in the near future

Dysphagia

• Negative consequence of multiple developmental, acquired & degenerative conditions

• Lengthy periods of rehabilitation

• Recognised challenges in provision of services
  – Access to services
  – Access to skilled dysphagia rehabilitation clinicians
  – Access to instrumental assessment
New models of care

.....TELEHEALTH

Multifected technology solutions

Tele terminology!

- **Telehealth**: “the use of medical information that is exchanged from one place to another via electronic communications to improve an individual’s health status” (American Telemedicine Association, 2012).

- **Telerehabilitation**: “…the delivery of rehabilitation services via information and communication technologies. Clinically this term encompasses a range of rehabilitation and habilitation services that include assessment, monitoring, prevention, intervention, supervision, education consultation and counselling.” (Brennan et al., 2011)

- Other terms used: telepractice, teletherapy, m-health, tele-dysphagia.............aghhhhh!
Why consider telehealth/telepractice?

Technology: Solutions for the challenges facing global health care

ACCESS
distance; patient factors/mobility; convenience; interagency communication;

Staff/specialist shortages
Service shortages

Other drivers:-
Patient factors
Health Economics
Telepractice Clinical Model

Still a long way to go to optimal implementation!!!!!

• Of the >3.4 million outpatient occasions of service provided through Qld Health 0.4% was provided via telehealth"

Telehealth Discussion Paper, Queensland Health, 2013

But what are the perceived barriers..........?

• Problems with technology & connectivity
• Issues with technology support
• Limitations of current technology for certain clinical uses
• Lack of appropriate reimbursement & funding
• Lack of training in the use of telehealth
• Lack of evidence of its effectiveness

Department of Health & Aging, 2011; Dunkley, Fatio, Wilson & McAllister, 2010; Hill & Miller, 2012; Zanella et al., 2007
Systematic Evaluation Process

- Pilot testing of system architecture (equipment/setup/connectivity) for clinical utility & feasibility
- Cohort testing for reliability & validity
  - Non-inferiority methodologies
- Patient / consumer (clinician, health service) satisfaction
- Clinical trials: full scale feasibility testing in clinics + economic analysis

Current evidence supporting the use of telepractice for Clinical Swallow Examinations (CSEs)

Initial evidence of feasibility?

  - 1 case study (L)CVA with dysphagia
  - Clinical swallowing examination
  - Satellite videoconferencing
    - Problems getting close up vision of oral cavity
  - BUT.....Able to determine nature & extent of dysphagia
- System design? Validity? Reliability? Safety?
Results from these initial feasibility studies?

System capabilities (vision, audio, system architecture) appear adequate for performing swallowing assessment

…..BUT! How will the system perform when used with patients at risk of aspiration?
10 simulated patients

Patient assistant
Simultaneous or sequential evaluations?

Sequential Ax
- Advantage:
  - no bias from watching other assessor
- Bias:
  - Known swallow to swallow variability
  - Patient variability over time
  - Learning / test-re-test effect
  - Ethical issues – repeat exposure to aspiration

Synchronous Ax
- Advantage:
  - Not impacted by swallow to swallow variability of patient variability
  - No ethical issues
  - No test-retest effect
- Bias:
  - Influence of other assessors performance

Results from this pilot study?
Excellent levels of agreement on oromotor & food fluid trial safety decisions

…..BUT! How will the system perform with real patients?

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Validité of conducting clinical dysphagia assessments for patients with normal to mild cognitive impairment via telerehabilitation (2012)
Ward, EC., Sharma, S., Burns, C., Theodoros, DG. & Russell, T

Clinical swallow examination (CSE) 40 dysphagics
- 23 male, 17 female
- Neurological (22), Other (18)
- Inpatient (18), Outpatient (22)
- Pts with moderate-severe cognitive deficits excluded
- Dysphagia Severity (DOSS*)
  - Mild n=11, Moderate n=22
  - Mod-severe n=7

• Oromotor Assessment
  - Oral Hygiene, Dentition status & Cranial nerve Ax
    - Kappa = range 0.63 - 1.00
    - PEA = range 83% - 100%
  - Theodoros et al., 2008; Hill et al., 2006; Ward et al., 2007; 2009

• Clinical decision during assessment
  - Anterior spillage, mastication, oral transit, oral residue, delayed swallow, laryngeal elevation, single/multiple swallow, wet voice, throat clear, volitional cough
  - Kappa = 0.61 - 1.00; PEA = range 79% - 100%

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Results

- **Diagnosis**
  - Oral/partial/non-oral, safe food & fluid consistency, DOSS
    - Kappa = range 0.93 – 1.00
    - PEA = range 95% – 100%

- **Management recommendations**
  - Need for instrumental Ax & which (FEES, MBS, either), urgency of referral, feeding assistance, oral hygiene management, referral for other professionals, SP review
    - Kappa = range 0.5* – 1.00
    - PEA = range 75%* – 100% referral to other professionals

Implications?

- **VALID** Clinical diagnostic decisions re:
  - Oromotor status
  - Safety for oral/non-oral
  - Safety for food and fluid consistencies
  
  ……….can be made in online environment

- **BUT**…..Specific system architecture is needed for dysphagia telerehabilitation
  - Assistant at patient end, split screen display, store and forward capability, remote zoom camera, lapel microphone etc

OK……..

…..So what do patients think??
Common Misperceptions!!

- "Old" people won’t want to use technology
  
  Early studies speculated that individuals, particularly the elderly, may not be supportive of, or willing to participate in receiving health care services via telehealth (e.g., Stanberry, 2000)
  
  But actually…..Many many many studies have failed to support this hypothesis!!!!

Common Misperceptions!!

- "People don’t have access to technology"
  
  Dunkley et al (2010) highlighted mismatch between clinician & patient perceptions
  
  SPs erroneously believed rural consumers of health services would have poor access to ICT
  
  ABS (2008) figures: 71% (83% in 2011) have access to computers
  
  61% (79% in 2011) have access to internet
  
  SPs erroneously believed rural residents would hold negative attitudes toward tele services
  
  In fact they expressed great willingness to try it

Assessing dysphagia via telerehabilitation: Patient perceptions & satisfaction (2013)
Sharma, Ward, Burns, Theodoros, & Russell

- 40 patients completed pre & post questionnaires
  
  - Pre-assessment – some were unsure of what to expect for visual and auditory quality
    
    But then nearly all were satisfied post
  
  - Post - comfort using tele & their belief in the value of tele was high
    
    83% felt the tele assessment was comparable to FTF Ax
  
    92% said they would be comfortable receiving dysphagia services via tele
OK……

…..do patient factors and/or dysphagia severity influence telepractice viability and outcomes?

Managing patient factors in the assessment of swallowing via telerehabilitation (2012)
Ward, Sharma, Burns, Theodoros, & Russell

- 10 patients (from cohort of 40) where assessing clinician indicated tele may not have been optimal mode of assessment
  - Reasons?
    - Speech / voice disorders; Hearing impairment; Dyskinesia / movement disorders; Behavioural / emotional issues
  - All assessments were conducted successfully – BUT required modifications of system and testing
  - Highlights importance of systems to have the flexibility to adjust for patient factors


Does dysphagia severity impact on clinical decision making via telerehabilitation?

Q1: Is Online Ax equivalent to FTF regardless of dysphagia severity?

Q2: Do clinician perceptions differ with dysphagia severity?

Funded: NHMRC APP1002472 (2011–12)
Participants

- 100 pts recruited from an Acute Care service
- Referred by managing clinician, based on CSE status (within 24 hrs prior)
  - 25 non-dysphagic (DOSS level 6 & 7)
  - 25 mild (DOSS level 5)
  - 25 moderate (DOSS level 3 & 4) *DOSS (O’Neil et al 1999)
  - 25 severe (DOSS level 1 & 2)
- Exclusion criteria:
  - Deemed medically unstable (Medical Officer)
  - Unable to be seated in at least semi-upright position

Procedure

Q1: Agreement on CSE

- Agreement per parameter across each of 4 groups

[Graph showing oral residue with different severity levels]
Q1: Oromotor Assessment

- 35 Parameters: Oral Hygiene, Dentition status & Cranial Nerve Ax
  - 32 reached 80% PEA/PCA criteria
  - 3 didn’t: Clearing throat on cue (78%), denture status (72%), Oral hygiene (72%)

Q1: Food / Fluid trials

- 18 Parameters: Anterior spill, mastication, oral transit, oral residue, delayed swallow, laryngeal elevation, single/multiple swallow, wet voice, throat clear, volitional cough
  - 17 reached 80% PEA/PCA criteria
  - 1 did not: No of swallows on food bolus (79%)

Q1: Diagnosis & Recommendations

- 12 Parameters: Oral/partial/non-oral, safe food consistency, safe fluid consistency, DOSS
  - 10 reached 80% PEA/PCA criteria
  - 2 didn’t: need for referral, referral for MBS
Q2. Do clinician perceptions vary?
*I am happy with the level of client-clinician rapport generated during this session*

No sig difference
p=0.418

Q2. Do clinician perceptions vary?
*I feel that I was able to satisfactorily & competently assess the client to the best of my abilities via tele*

Severe Gp
- sig p=0.0004

Why?

- Issues reported with
  - low/soft vocal quality – made Ax of voice and voice quality post swallow difficult
  - inability to complete oromotor tasks and post swallow voicing on command
  - comorbid movement disorders or agitation/impulsivity - impact on visual quality
  - the presence of inconsistent clinical signs of aspiration

Conclusion: Implications of severity?

Online decisions comparable regardless of severity

- but -

Clinicians noticed the additional complexity

Impact of Aphasia severity (Hill et al., 2009)
Patient factors more influential on session (Ward et al., 2012)
Implications for experience & training of clinicians

So……..

…..how does it run as a clinical service?

Evaluation of a clinical service model for dysphagia assessment via telerehabilitation (2013)
Ward, Burns, Theodoros, & Russell

- Service characteristics from 100 patient Ax
- Results
  - Session Statistics: mean=45mins, minimal technical difficulty
  - Perceptions: Pt satisfaction was high; Clinicians felt they developed good rapport, found the system easy to use & were satisfied with >90% of sessions.
  - Facilitators of the service?
    - Screening pt suitability, having good general organization & skilled staff
Current evidence supporting the use of telepractice for Instrumental Swallow Examinations: MBS & FEES

Evidence to date

- Research to date has focused on Videofluroscopic Assessments
- Perlman & Withawaskul (2002)
  - Teledynamic Evaluation Software System (TESS) for telefluroscopic assessment
  - No patient data or validity testing
- Malandraki et al (2011)
  - Used TESS with 32 pts
  - 2 MBS sequential, 30min apart; FTF & telefluroscopic
  - Furo video sent to interface computer & relayed in real time to remote computer.
  - Web cam + speaker phone allowed interaction with Pt
  - Good agreement in:
    - Severity ratings, PAS scores;
    - Treatment recommendations
Current trial No 1:
MBS assessments via telepractice
Burns, Ward, Hill, Porter & Phillips
Live, guided MBS assessment

Current trial No 2:
FEES assessments via telepractice
Burns, Ward, Hill & Kelly
Live, guided FEES assessment

What about dysphagia management?
Can a computerised home therapy program provide an effective and cost-efficient model for delivering intensive, swallowing therapy? Wall, Ward, Cartmill, et al (in testing)
Aims

1. Primary outcomes: Aspiration risk & oral intake
   a. Clinician-directed
   b. SwallowIT
   c. Standard care
2. Secondary outcomes: nutrition, quality of life, fatigue, anxiety/depression
3. Therapy adherence
4. Economic analysis

H&N Cancer post discharge management

- Many patients experience dysphagia following H&N cancer treatment
  - Pts receive treatment in dedicated HNC multidisciplinary teams often located in metropolitan centres
- Challenge of providing post-discharge support for patients in rural / remote areas
  - Absence of clinicians
  - Absence of clinicians with HNC mgt skills
A pilot trial of a speech pathology telehealth service for head and neck cancer patients

- Enhancing post discharge support for patient with HNC
- 2 Sites
  - Metro Cancer Service (RBWH)
  - Regional Centre (Nambour General Hospital)
- 6 month pilot service
  - Weekly clinics
  - 2-4 pts / telehealth clinic
A pilot trial of a speech pathology telehealth service for head and neck cancer patients

Pilot Outcomes……………..

- Data from 50 sessions provided to 18 unique patients
  - 15 pts had swallowing mgmt as part of care
- Successful management of issues without need to return to metropolitan centre
- Patients & clinicians very happy with service
- Significant cost savings for patients

Burns, Ward, Hill et al (Project underway): RCT evaluation of a Telehealth Hub & Spoke Clinical Service Model

In conclusion…. 
We have emerging evidence

- **What we have:**
  - Evidence for conducting CSE via telehealth
  - Early evidence for conducting instrumental swallowing assessment via telehealth
  - Early evidence for its role in dysphagia training & support

- **What we need:**
  - Evidence needed to support dysphagia management via telehealth
  - Larger trials; validation across multiple different types of systems; health economic analysis

(Ward & Burns, in press)

References


