The use of sensory and chemesthetic stimuli in the treatment of oropharyngeal dysphagia: scoping practice in the UK and Ireland

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Abstract

The use of sensory and chemesthetic stimuli in the treatment of oropharyngeal dysphagia: scoping practice in the UK and Ireland.

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Background: This study was conducted as part of a wider study to discover if speech and language therapists working in the UK and Ireland are using sensory and chemesthetic stimuli in oropharyngeal dysphagia treatment and management and the reasoning behind its use. This is the qualitative component of the study. From analysis of the literature it appears that sensory and chemesthetic stimuli are not being utilized in oropharyngeal dysphagia therapy (Foley et al 2008; McCurtin 2012). Research evidence has emerged in recent years on the effectiveness of these stimuli.

Objectives: To explicate the reasoning behind why speech and language therapists use or do not use sensory and chemesthetic stimuli in the management and treatment of dysphagia.

Methods: A survey methodology was used. The survey link and recruitment email was sent out to the secretaries of dysphagia Special Interest Groups in Ireland and the UK. Thematic analysis was used.

Results: Six main themes emerged. These themes include – what stimuli are used and when, to improve, risk factors, client benefits, lack of knowledge, lack of evidence and external factors. Both sensory and chemesthetic stimuli were reported as being used. A super-theme was developed from analysis of these themes entitled ‘Practice as specific, individual and safety conscious inhibited by barriers of a lack of knowledge, practicality and procedure’. This will be further explained in the discussion of results.

Conclusions: From detailed analysis of the results the findings suggest that speech and language therapists have a clearly reasoned and thought out approach for the management of dysphagia clients. The reasons for non-use can be described as around issues of practicality and knowledge with a lack of evidence also cited as problematic.

Keywords: sensory and chemesthetic stimuli, oropharyngeal dysphagia, speech and language therapy.
1. Introduction

1.1 Introduction and Aims:
The aim of this project is to discover the reasoning behind the use and non-use of sensory and chemesthetic stimuli in the treatment of patients with oropharyngeal dysphagia. There is some initial evidence which shows that the swallowing function is sensitive to sensory and chemesthetic qualities of food (Logemann et al. 1995; Kaajii et al. 2002; Sciortino et al. 2003; Shingai et al. 1989). This suggests that the thresholds of swallow elicitation can be elicited through using sensory and chemesthetic stimuli. However it is not clear whether such stimuli or techniques are actually being used in dysphagia therapy. According to ASHA (2008) the prevalence of dysphagia may be as high as 22% in those over 50 years of age (Howden 2004) and with an expected increase in neurogenic disorders these figures are expected to rise. Taking these factors into consideration it is vital that new dysphagia treatment programmes are trialled and introduced into the management of dysphagia. This section will review literature in this area and will be divided into three main sections:

- Oropharyngeal Dysphagia
- Clinical Practice
- Sensory and chemesthetic stimuli

1.2 Oropharyngeal Dysphagia
Oropharyngeal dysphagia can be defined as an abnormality in the swallowing physiology of the upper aero digestive tract (Martino et al. 2000). Restriction of diet consistency is a common recommendation for patients with oropharyngeal dysphagia (Steele et al. 2003). In oropharyngeal dysphagia areas of dysfunction can include: - an inability/excessive delay in the initiation of the pharyngeal swallow, aspiration, nasopharyngeal regurgitation and bolus residue within the pharyngeal cavity post swallow (Cook and Kahrilas 1999). Touch and pressure receptors are located in the tongue and palate which provide distributed sensory input and can be read in the central nervous system (CNS). This sensory information is used by the CNS to inform tongue shape and associated pressures in order to successfully squeeze the bolus toward the pharynx (Poudereux and Kahrilas 1995). Research shows that the stimulation of a greater number of receptive fields and sensory neurons will induce a
stronger swallowing reflex with greater muscle recruitment and force. Therefore stimulation of the oral region does appear to facilitate swallow reflex initiation (Steele and Miller 2010).

Taste can be described as a major determinant of food preferences in non-dysphagic populations (Feeney et al 2011; Schwartz et al 2009) thus it has the potential to influence treatment outcomes with dysphagic populations. Taste thresholds have been found to increase with age, illness and medication (Behrman et al 2010). Taste receptor cells are stimulated by the flavours salty, sweet, bitter, sour and umami (Lawless and Heymann 2010). Sensory information from taste is carried to the medulla where it is integrated with somatosensory, olfactory and chemesthetic information (Small 2010; Small and Green 2012).

1.3 Dysphagia and Clinical Practice

**Common Interventions:** Foley et al (2008) conducted a systematic review and found that common interventions in dysphagia therapy include dietary modifications and swallowing treatment programmes (Teasell et al EBRSR). McCurtin (2012) found that the 3 most common dysphagia therapies used in Ireland were texture modification, thickening liquids and changes in position (p.123). Below is a summary of some key interventions in dysphagia therapy. Other interventions in the management of dysphagia include: oro-motor exercises, DPNS techniques and Shaker exercises.

**Diet Modification:** There are numerous studies on the effectiveness of diet modification as a therapy intervention for dysphagia (Logemann et al 2008; Bulow et al 2003; Speyer et al 2010; Clave et al 2006; Teasell et al EBRSR; Raut et al 2001; Steele and Miller 2010; Pelletier and Dhanaraj 2006) state that the elicitation of a safe swallow can be dependent on the amount of lingual pressure formed when the tongue is compressed against the hard palate to propel the bolus. Bolus volume alone does not appear to affect lingual pressure (Miller and Watkin 1996; Poudreux and Kahrilas 1995; Shaker et al 1988).

Recommendations for diet modifications of texture and viscosity are often not accepted by patients without complaint (Huckabee and Pelletier 1999). Patients are at risk of becoming dehydrated and malnourished because of this poor taste acceptance (Pelletier and Lawless 2003) and from rarely meeting their fluid intake.
requirements (Finestone et al 2001). People on diets using thickened liquid have also been found to have a higher incidence of pneumonia (Logemann et al 2008).

**Enteral feeding:** Enteral tube feeding by percutaneous endoscopic gastrostomy (PEG) or nasogastric (NG) tube feeding is another method of intervention for patients with dysphagia. However this method of feeding is not appropriate for all populations, for example there is a significant evidence base against the use of PEG or NG tube feeding for patients with advanced dementia (Hanson et al 2011; Givens et al 2012). Feeding with PEG is also associated with a higher rate of death or a poorer outcome than with feeding by NG (FOOD Trial Collaboration 2005; Bath et al 2004). Other clear problems with this intervention are the invasive nature of feeding through either PEG or NG tube. For some patients the cosmetic appearance of the NG tube is also an insurmountable disadvantage. Feeding is in itself a social activity and the use of enteral tube feeding reduces the social interaction for the patient in a hospital or nursing home setting.

**Rehabilitative Strategies:** Postural changes are often used during intervention for oropharyngeal dysphagia; however there are a number of drawbacks to using this approach. Patients may have cognitive and/or communication deficits, poor compliance or fatigue easily. This in turn limits the potential for this type of strategy and highlights the importance of finding interventions which require fewer cognitive and physical demands on the patient (Sdravou et al 2012).

From analysing these key interventions it is clear that evidence for these dysphagia therapies have varying outcome results in therapy (Speyer et al 2010) and the number of therapies and techniques is clearly limited. For this reason it is important to research and introduce new interventions which may provide better clinical outcomes and better quality of life. As more evidence emerges supporting the use of sensory and chemesthetic stimuli in dysphagia therapy the rationale for common clinical practice in dysphagia needs to be understood.

**1.4 Clinical Practice**

As mentioned above the treatment of patients with oropharyngeal dysphagia is dominated by a limited number of therapies. Clinician preference rather than a strong
evidence base has been found to have a major impact on the type of dysphagia therapy which is implemented (Krisciunas et al 2012; Archer et al 2013).

Use of interventions by clinicians: In recent years the emphasis on evidence based practice has meant that clinicians are now integrating clinical expertise, current research evidence and clients views in order to provide the most effective intervention possible (Muttiah et al 2011). For clinicians themselves clinical experience and colleagues guidelines were found to be leading factors when planning intervention; more so than evidence based practice and clinical practice guidelines (Zippoli and Kennedy 2005). This shows that there are clearly a number of barriers preventing the successful implementation of evidence based practice. One of these barriers is a culture of using traditional methods which are resistant to change (Ross 2006). Another barrier identified is that clinicians may lack the relevant skills to implement evidence based practice (Rappolt and Tassone 2002). Kamhi (2006) found that a lack of evidence in some areas of speech and language therapy has meant that speech and language therapists (SLTs) have had to adopt a trial and error approach when implementing therapy. In a recent study of SLTs in the south of Ireland it was found that a lack of time to read the research and implement new ideas was cited as the most common problems affecting evidence based practice (O’Connor and Pettigrew 2009). McCurtin and Roddam (2012) suggest that evidence based practice may be seen as irrelevant rather than unimportant by SLTs.

Systematic reviews of dysphagia therapy found that there are a limited number of therapies for the treatment of dysphagia (Foley et al 2008). Wheeler-Hegland et al. (2009) in their systematic review found that while SLTs value evidence-based practice the conflicting and limited evidence for a range of dysphagia therapies is a significant barrier to its implementation. Furthermore a lack of time and resources has made integrating evidence practice into clinical decision-making difficult (Zippoli and Kennedy 2005; Nail-Chiwetalu and Bernstein Ratner 2007). These challenges facing SLTs when implementing evidence based practice may be a contributing factor for the underutilization of sensory and chemesthetic stimuli in oropharyngeal dysphagia. Growing research indicates its effectiveness in eliciting a safe swallow and questions the effectiveness of other dysphagia interventions, however until clinicians
are given the resources to combat the barriers to evidence based practice the use of these stimuli will not become common practice in dysphagia therapy.

1.5 Sensory and Chemesthetic Stimuli

Sensory stimuli: Research suggests that heightening sensory input during the oropharyngeal phase through a compensatory strategy can effectively manage oropharyngeal dysphagia (Bartoshuk et al 2003; Logemann 1996; Miller 2008; Robbins et al 2008; Steele and Miller 2012). The excitability of the central pathway is enhanced through increased or specific sensory input to the oropharyngeal receptors (Sdravou et al 2012). Increased activation of the swallowing centres triggers faster responses and in doing so reduces aspiration (Logemann 1996; Miller 2008; Mistry and Hamdy 2008).

Following this Logemann et al. (1995) found that the application of sour boluses to heighten sensory input significantly improved the timing of the onset of the oral swallow. Patients exhibited reduced pharyngeal delay time, oral transit time, improved swallow efficiency and reduced aspiration. In further research Pelletier and Lawless (2003) found that oral and pharyngeal transit times were shortened when using a sour bolus. Research also shows that the thermal modification of water alters swallowing behaviour in dysphagic patients thus slowing the swallow and reducing swallow capacity (Hamdy et al 2003; Selcuk et al 2007; Triadafilopolous et al 1998). From these studies we can deduce that there is some limited evidence that sensory stimuli may improve the swallow and manage oropharyngeal dysphagia.

Chemesthetic stimuli: Chemesthetic stimuli can be defined as the sense of a chemical irritation to common somesthetic receptors elicited by a variety of chemical stimuli (Sdravou et al 2012). Chemesthesia is not defined as a taste or a smell but can be best described as responsible for the sensation of carbonation in a soft drink, the hotness of a chilli or the coolness of menthol (Pelletier and Dhanaraj 2006). High salt and citric acid have also been found to elicit chemesthesia mediated by the trigeminal nerve (Pelletier and Dhanaraj 2006). Studies show that changes can be provoked through using carbonation as a stimulus in oral feeding for dysphagic patients (Bulow et al 2003; Krival 2007; Pelletier and Dhanaraj 2006; Michou et al 2012; Miura et al 2009). Sdravou et al. (2012) also found that carbonated thin liquids “shows promise in
significantly reducing penetration and aspiration” (p.248) in their chosen research population. Lawless and Heymann (2010) found that taste receptor cells which are receptive to carbonation are also sensitive to temperature, therefore greater perceptions of irritation, tactile sensations and cooling have all been observed with a carbonated beverage which is served at a low temperature. Citrus, capsaicin and menthol were also found to provoke changes in dysphagic individuals (Ebihara et al 2006; Kajii et al 2002; Logemann et al 1995; Palmer et al 2005; Pelletier and Dhanaraj 2006; Pelletier and Lawless 2003). While evidence is limited on the effectiveness of chemesthetic stimuli these studies illustrate that chemesthetic stimuli can provoke changes in the swallow of dysphagic patients to potentially reduce the risk of penetration and aspiration.

While research is still emerging on the long term effectiveness of sensory and chemesthetic stimuli the theory behind both stimuli is scientifically valid. There is a growing body of evidence behind the use of chemesthetic/sensory stimuli particularly the use of carbonation and the sour bolus which could be easily implemented in clinical practice. As with much of speech and language therapy more research still needs to be conducted.

1.6 Concluding Remarks:

From analysis of the literature there are no studies specifically looking at the use and reasoning for use of sensory and chemesthetic stimuli in dysphagia therapy in Ireland and the UK. This study found that there is limited but emerging scientifically based research on the effectiveness of sensory and chemesthetic stimuli in provoking changes in the swallow and in preventing and reducing aspiration (Pelletier and Dhanaraj 2006; Bulow et al 2003; Krival 2007; Sdравou et al 2012; Ebihara et al 2006; Kajii et al 2002; Logemann et al 1995; Palmer et al 2005; Pelletier and Lawless 2003; Logemann et al 1995; Pelletier and Lawless 2003; Hamdy et al 2003; Selcuk et al 2007; Triadafilopolous et al 1998; Steele and Miller 2012; Miura et al 2009). Reasons for non-use of these stimuli in dysphagia therapy may be due to the lack of implementation of evidence based practice and specific clinician preference (Muttiah et al 2011; Zippoli and Kennedy 2005; Ross 2006; Rappolt and Tassone 2002; Kamhi 2006; O’Connor and Pettigrew 2009; McCurtin and Roddam 2012). Much of past research has focused on bolus modification techniques as a whole when establishing
common clinical practice, however in light of a growing evidence base it is indicated that the use of sensory and chemesthetic stimuli in the UK and Ireland be defined.
2. Methodology
84 SLTs took part in this study. Participants were members of dysphagia Special Interest Groups (SIGs) who work in Ireland or the UK. A companion study was also completed which analysed quantitative results from the data.

2.1 Participants and Recruitment:
Participants specified had to be a) qualified Speech and Language Therapists b) working with a dysphagia population c) members of a dysphagia Special Interest Group in Ireland or the UK. Participants were recruited via email. The email and survey link was sent to the secretaries of dysphagia SIGs who acted as gatekeepers and forwarded the email to SIG members. 7 dysphagia SIGs were contacted in total. These included SIGs in Scotland, Wales and Northern Ireland as well as a paediatric and adult SIG in England and the Republic of Ireland. The secretary of the adult SIG in England responded to an email agreeing to act as a gatekeeper however the email was not forwarded to SIG members.

Gatekeepers were emailed initially to obtain consent from them to forward the survey to the SIG members. Once consent had been obtained the survey link along with an information sheet (See Appendix 2&3) was sent to the secretaries of the dysphagia SIGs. However after 3 weeks only 44 participants had completed the survey and so a reminder email was sent to Gatekeepers and the survey was kept live for another week. A reminder email of the closing date for the survey was also issued. After this email was sent out participants of the survey increased to 84. There were 2 qualitative questions in the survey and all participants of the survey answered one or the other.

2.2 Research Instrumentation:
A survey methodology was used as the method of data collection in this present study. As this is part of a companion study the authors felt that this was the most suitable form of collecting both quantitative and qualitative data regarding the use and reasons for use (or non-use) of sensory and chemesthetic stimuli in the treatment of oropharyngeal dysphagia. The survey was composed of three parts. Data for this study was gathered using information from the demographic part of the survey and from two open-ended questions in the second part on practice behaviour and reasoning. Parts 1 and 3 of the study provide a description of the respondent sample
and allow for investigation regarding relationships between respondent characteristics and therapy choices. Part 2 investigates the sensory and chemesthetic stimuli used by participants based primarily on use/non-use and frequency of use ratings. Reasoning supporting use or non-use of sensory and chemesthetic stimuli was elicited through the use of open-ended questions. A copy of the survey design can be found in Appendix 1.

2.3 Method: The study reported here represents an attempt to explain the reasons for use or non-use of sensory and chemesthetic stimuli in oropharyngeal dysphagia using thematic analysis. This study sought to generate data from which an understanding might be developed. It is a study of a SLT’s reasons for use or non-use of sensory and chemesthetic stimuli in the treatment of oropharyngeal dysphagia.

This study used qualitative analysis as “qualitative methods are designed to study social action that is always meaningful and symbolic in nature, we can expect that appropriate methodology will result in comprehensible and authentic results and that our conclusions may have veracity and utility (Damico and Simmons-Mackie 2003)”.

This study used thematic analysis to gain a better understanding of the reasons for use or non-use of these stimuli. Survey responses were analysed, with keywords extracted and later placed into thematic categories.

2.4 Data Collection: After obtaining ethical approval for the research project from the Faculty of Education and Health Sciences Research Ethics Committee in the University of Limerick, planning began on the survey design.

Demographics: Demographic questions were used in the study to enable the use of data correlations between participant characteristics and other data from open-ended questions. A total of 6 demographic questions were utilised as per Table 2.

Table 2: Demographic questions:

1. Years working as a Speech & Language Therapist
2. Years working with clients with dysphagia
3. Percentage of clinical practice working with dysphagia clients

4. Country of practice

5. Main age group

6. Main dysphagia client group

Open ended questions: Two primary topic areas were probed in the open-ended questions, a) reason for use of sensory and chemesthetic stimuli b) reason for non-use of sensory and chemesthetic stimuli. The questions are as phrased below:

1. If you use sensory or chemesthetic stimuli in your management of dysphagia, please tell us why you use such techniques.
2. If you do not use sensory or chemesthetic stimuli in your management of dysphagia, please tell us why you do not use such techniques.

2.5 Data Analysis:
Preparation and analysis of the survey responses generally followed guidelines as outlined by Babbie (2008). Once the survey was no longer live the SLT student read each answer multiple times and transcribed all responses onto a working sheet where any information considered important or deemed relevant to the study was highlighted. An advantage to having the data available electronically is that it could be analyzed and categorised more easily. Braun and Clarke (2006) state that analysis is not a recursive process; rather it is a liner one. In this way research analysis was an interactive and reflexive process. In analysis of the data any commonly used abbreviations were considered in the study and less known abbreviations were omitted.

2.6 Thematic Analysis:
Thematic analysis focuses on identifiable themes and patterns of living and/or behaviour (Aronson 1994). Braun and Clarke (2006) argue that thematic analysis can be considered an analytic method in its own right and so for this reason it was not used in conjunction with other analytic methods e.g. grounded theory. Boyatzis (1998) states that thematic analysis can go further than simply organising the data to also interpreting various aspects of the research topic.
This study incorporated both an inductive approach as outlined by Boyatzis (1998) and a deductive approach (Crabtree and Miller 1999) of thematic analysis. This approach is appropriate as it allowed for theory to be integral to the process of deductive thematic analysis while allowing for themes to emerge directly from the data using inductive coding (Fereday and Muir-Cochrane 2006). This analysis involves coding the data without fitting the data into a pre-existing coding form or any analytic preconceptions.

2.7 Thematic Coding Procedures:
The development of themes in this study was guided by Braun and Clarke’s (2006) belief that a theme captures the importance of an idea which relates to the research question. Braun and Clarke (2006) define coding as categorisation to reflect progress of the thematic, conceptual and theoretical. For the purpose of this study themes were identified that were both specific enough to be discrete and broad enough to encapsulate a set of ideas (McCurtin 2012).

Initially coding was utilized on a question by question basis, followed by a group basis. Equal attention was given to each data item and the data was worked through analytically. This was achieved by following Boyatzis (1998) and Crabtree and Miller (1999) guidelines regarding coding. First a coding manual was developed to organise segments or related text to assist in the interpretation of data (Crabtree and Miller 1999). Codes were identified by the code label and the definition of what the theme concerns. Subsequent analysis allowed for refinement and recoding to occur across the data set. Coding progressed from the most clearly relevant themes to more hidden themes in the data which reflected a progression from descriptive to meaningful interpretation.

Boyatzis (1998) and Crabtree and Miller (1999) describe stages of coding and theme development for both inductive and deductive thematic analysis. Data in this study was coded according to these stages. Table 3 illustrates the stages of coding.

Table 3:

| Stage 1: Developing the coding manual | Stage 2: Summarizing data and identifying initial themes |

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15 | Page
### Stage 3: Applying template of codes and additional coding

### Stage 4: Connecting the codes and identifying themes

### Stage 5: Corroborating and legitimating coded themes

#### 2.8 Theme representation: Mind maps and networks

Thematic networks aim ‘to facilitate the structuring and depiction of themes’ (Attride-Stirling, 2001, p.387). In thematic networks levels are represented as web-like maps depicting the relevant themes at each of the levels thereby illustrating the relationship between them. For this study a networks approach was employed. In this way the data can be viewed as a thematic map or network (Braun and Clarke 2006; Attride and Stirling 2001). Mind maps were used to enable plotting of themes. They were also colour coded so that the allocation of themes and codes could be clearly followed. See Chapter 3 for illustrations of mind maps.

#### 2.9 Reliability and Rigour

Lincoln and Guba (1985) criteria to ensure reliability can be described as the ‘gold standard’ in qualitative research (Whittemore et al 2001). These principles include: credibility, transferability, dependability and confirmability. These principles were applied to this study as:

- The research is credible as findings make sense and are believable.
- The research illustrates transferability and dependability as findings from this study are relevant to the implementation of evidence-based practice.
- Findings were congruent with data found in other similar studies.

Verification strategies as outlined by Morse et al. (2002) were also applied to this study to ensure reliability and validity of data. This was achieved through methodological coherence which ensured there was congruence between the research question and components of the survey. The sample was appropriate as it consisted of participants who had best knowledge of the research topic i.e. SLTs working in the area of oropharyngeal dysphagia. Data was collected and analyzed concurrently to facilitate the interaction between data and theory. Throughout the process of data analysis the author used theoretical thinking to ensure that themes which emerged from the data could be confirmed from verification of the data already
collected. Finally theory development occurred as theories were developed as an outcome of data analysis rather than adopted as a framework to assist in the analysis of data.

The strategies employed by the author to ensure rigour, representativeness and coding reliability include:

- Immersion in the data prior to analysis
- Recording of each stage of the process
- The use of mind maps to show the development of coding
- A colleague was provided with 6 thematic themes and 10 keywords and asked to place each keyword into the thematic category they felt most appropriate. Inter rater agreement between the researcher and colleague was 90% (9 out of 10 keywords were assigned to the same thematic category by both rater’s independently).
- Reflective summaries were carried out at each stage of coding

2.10 Reflective summaries
Reflective summaries were undertaken to enable reflection and understanding of the data and ensure reliable themes were generated. Self-reflection occurred through the use of a reflective diary. The use of a reflective diary ensured that the author was open to other themes which may develop from the data as well as having an increased awareness to author’s bias.
3. Results

Results of data collection will be reported in this section. First demographic information of the participants will be illustrated. Then the responses to the question “Reasons for use of sensory and chemesthetic stimuli” will be outlined followed by “Reasons for non-use of sensory and chemesthetic stimuli”. The data analysed will be summarized in mind map representations and quotations from participants.

3.1 Demographics:

Table 3 outlines the demographics for this study:

<table>
<thead>
<tr>
<th>Respondents</th>
<th>Number</th>
<th>Percentage %</th>
</tr>
</thead>
<tbody>
<tr>
<td>Complete Respondents</td>
<td>84</td>
<td>100</td>
</tr>
<tr>
<td><strong>Years Working/Working with dysphagia</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 5</td>
<td>20 / 26</td>
<td>23.81 / 30.95</td>
</tr>
<tr>
<td>Between 5 &amp; 10</td>
<td>21 / 25</td>
<td>25 / 29.76</td>
</tr>
<tr>
<td>More than 10</td>
<td>43 / 33</td>
<td>51.19 / 39.29</td>
</tr>
<tr>
<td><strong>Clinical Practice with dysphagia</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 25%</td>
<td>13</td>
<td>15.48</td>
</tr>
<tr>
<td>Between 26 &amp; 49%</td>
<td>16</td>
<td>19.05</td>
</tr>
<tr>
<td>More than 50%</td>
<td>55</td>
<td>65.48</td>
</tr>
<tr>
<td><strong>Country of Work</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>England</td>
<td>1</td>
<td>1.19</td>
</tr>
<tr>
<td>Northern Ireland</td>
<td>5</td>
<td>5.95</td>
</tr>
<tr>
<td>Republic of Ireland</td>
<td>45</td>
<td>53.57</td>
</tr>
<tr>
<td>Scotland</td>
<td>20</td>
<td>23.81</td>
</tr>
<tr>
<td>Wales</td>
<td>13</td>
<td>15.48</td>
</tr>
<tr>
<td><strong>Age Group</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Adults</td>
<td>71</td>
<td>84.52</td>
</tr>
<tr>
<td>Children</td>
<td>13</td>
<td>15.48</td>
</tr>
</tbody>
</table>

**Population**
The majority of participants reported using sensory and chemesthetic stimuli (74%) in their management of dysphagia while 26% of participants reported not using either stimulus in their management of dysphagia. Demographic information shows that the majority of participants have worked as SLT’s for over 10 years (51.19%). However, only 39.3% of participants have worked with clients with dysphagia for this period of time. 65.5% of participants reported spending over 50% of their time working on dysphagia caseloads. This is a significant number when according to literature the number of dysphagia therapies and techniques is limited (Speyer et al 2010). The three main client populations that participants work with in the area of dysphagia are: acquired neurological disorders (47.6%), people with dementia (15.5%) and profound and multiple disabilities (11.9%). The majority of respondents were from the Republic of Ireland, followed by Scotland and Wales.

3.2 Themes:
Data analysis revealed 7 main themes and each of these themes also contains sub themes. From analysis of all themes it was possible to then develop a super theme.
The illustration below shows a summary of the 7 main themes and super theme.

The super theme which developed in emergence to analysis of the themes is: **Practice as specific, individual and safety conscious inhibited by barriers of a lack of knowledge, practicality and procedure.** Seven main themes are represented in the super theme. These are:

1. At Risk
2. To Improve
3. What stimuli is used and when
4. Client Benefits
5. Lack of Guidelines
6. External Factors
7. Lack of Knowledge
Above is a mind-map illustrating the reasons for use of sensory and chemesthetic stimuli in oropharyngeal dysphagia therapy.
3.3 What Stimuli is Used and When:

“Spicy, sweet and strong flavours to benefit the swallow and increase oral intake” (Participant 41)

Participants who use sensory and chemesthetic stimuli reported using different types of stimuli. These can be separated into the categories of: spicy, iced, strong, carbonated, sour and sweet.

- Participant 1 reported using “lemon glycerine swabs”, which would fall into the category of sour.
- The most popular stimulus used was carbonated; participant 5 for example reported using carbonisation for its “effect on penetration”.
- Participant 25 reported using “iced flavours to increase sensation”.

Another aspect of this theme involves the situations when sensory and chemesthetic stimuli are used or when SLT’s reported feeling that it was indicated. Participant’s reported using these stimuli in both the assessment and management of dysphagia.

- Participant 1 reported using “lemon glycerine swabs to complete DPNS techniques”.
- Participant 22 reported using chemesthetic and sensory stimuli when clients have had “radiotherapy and rehabilitation and post-surgery”.
- Participant 36 also reported “trialling sensory and chemesthetic stimuli during video-fluoroscopy assessment”.

3.4 Client Benefits:
The main theme of client benefits can be separated into two sub-themes.

1) Population

“People with dementia and people with dysphagia post cancer” (Participant 3)

The sub-theme of population refers to the client populations participants reported using sensory and chemesthetic stimuli with.

- Participant 19 reported using these stimuli to “maximise sensory input with the COPD population”.

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22 | P a g e
Participant 42 reported using “stronger flavours with dementia patients as triggers to remind them to swallow”.
Participant 17 reported using stimuli with clients with “Autism Spectrum with over/under stimulation of the oral cavity”.

2) Client-centred approach

“If the patient is drinking thickener or taking medication” (Participant 2)

Participants reported using sensory or chemesthetic stimuli for a number of reasons which fall into the sub-theme of a client-centred approach. Client-centred reasons for the use of stimuli in dysphagia management include: patient preference, to stimulate an appetite, to provide holistic care and to provide patient-centred care.

- Participant 63 reported using sensory and chemesthetic stimuli as a “trial and error approach” and “if holistically indicated”.
- Participant 52 reported using stimuli according to “patient preference”.
- Participant 43 reported using stimuli “to give the patient every chance of improvement”.

3.5 To Improve:

“To increase bolus awareness and reduce bolus holding” (Participant 10)

Participants gave explicit reasoning for their use of sensory or chemesthetic stimuli. Categories came under this theme as participants reported using stimuli to improve specific areas.

- Participant 3 reported using these stimuli to “improve swallowing and pleasure or taste for people”.
- Participant 4 reported using stimuli to “increase stimulation to the oropharynx and to improve the impaired modulation of swallowing”.
- Participant 53 reported using stimuli to “improve neural response and excite taste stimuli”.

3.6 At Risk:

The main theme of At Risk can be separated into 2 sub-themes.
1) Clients at risk

“...explore lingual palatal pressures and to reduce penetration aspiration”
(Participant 55)

Participants reported using sensory and chemesthetic stimuli with clients who were ‘at risk’ or for whom swallowing was not safe.

- Participant 9 reported using stimuli in their management of dysphagia to “reduce penetration/aspiration risk....reduce choking risk”.
- Participant 5 reported using stimuli to “reduce pharyngeal residue in adults.... and its effect on penetration”.
- Participant 46 reported using these stimuli in their management of dysphagia to “ensure safety of swallow”.

2) To explore

“To increase intra-oral sensation and explore awareness in the oral cavity”
(Participant 38)

Under the theme of At Risk another sub-theme developed entitled ‘To explore’. This refers to the way in which participants reported using sensory and chemesthetic stimuli with at risk clients to explore specific areas which may be impacting on the client’s swallow.

- Participant 6 reported using said stimuli to “explore the changes on certain swallow parameters”.
- Participant 15 reported using the stimuli to “explore oral pharyngeal control of the bolus”.
- Participant 53 reported using the stimuli to “explore the client’s response...and maximise swallow effectiveness/efficiency”.

Above is a mind-map illustrating the barriers to using sensory and chemesthetic stimuli in oropharyngeal dysphagia therapy.
3.7 Lack of knowledge:
“Not aware of these techniques. Do not know how to use them correctly” (Participant 20a)

The most common theme which occurred in analysis of the reasons for not using sensory or chemesthetic stimuli was that of a lack of knowledge. A sub-theme of a lack of knowledge was a lack of training. Participants reported having no experience in using sensory or chemesthetic stimuli and reported that it was never addressed in training.

- Participant 7a reported that sensory and chemesthetic stimuli are “not always appropriate... lack of awareness or exposure to certain techniques”.
- Participant 10a reported that “it was never addressed or included in dysphagia training”.
- Participant 18a reported “not sure how to (use)... not aware of method”.

3.8 Lack of Guidelines:
“Unsure if there is a strong evidence base for any long lasting effect on the swallow” (Participant 24a)

A lack of guidelines was developed as a main theme under reasons for non-use of sensory or chemesthetic stimuli. This theme also contains the sub-theme of a lack of evidence. Participants reported a lack of guidelines in different assessment areas such as carryover into functional daily life, improvement and in assessing instrumental measures.

- Participant 5a reported not using sensory and chemesthetic stimuli in their management of dysphagia as “there is no clear cut approach in assessment or treatment.... not a definite part of the assessment/treatment process”.
- Participant 3a reported that they are “unaware of benefits and am currently following IASLT guidelines”.

3.9 External Factors:
The theme of external factors was developed as a reason for non-use of sensory or chemesthetic stimuli. A sub-theme of this theme is appropriateness of use. Under the sub-theme of population participants reported working with a number of dysphagia client populations which they felt it is not appropriate to use sensory or chemesthetic stimuli with.
Participant 7a reported that these stimuli are “not always appropriate for the client group”.

Participant 8a reported that with a dysphagia caseload of children (babies and children under 5 years of age, with a developmental delay or with alternative feeding) they would generally modify the client’s diet or work on feeding and oro-motor development.

The theme of external factors was created as a number of sub themes developed which indicated that reasons for non-use of sensory or chemesthetic stimuli practice behaviours were sometimes outside of the SLT’s level of control.

Participant 6a reported not using sensory and chemesthetic stimuli as they are “limited by hospital budgets and purchasing arrangements... difficult to obtain materials”.

Participant 13a reported that it is “hard to access a variety of tastes”.

Participant 1a reported not using sensory and chemesthetic stimuli due to “a lack of time and caseload pressures”.
4. Discussion

This study explores the reasoning behind the use or non-use of sensory and chemesthetic stimuli in the management of oropharyngeal dysphagia. The aim of this project was to discover the clinical reasoning behind why SLTs use or do not use sensory and chemesthetic stimuli.

4.1 Super theme

The super theme which was developed as a result of detailed analysis of the main themes is: ‘Practice as specific, individual and safety conscious inhibited by barriers of a lack of knowledge, practicality and procedure’. This super theme can be broken down into a number of components each of which comprises a main theme. The super theme which evolved from analysis of the main themes illustrates the reasons for clinical practice in the area of sensory and chemesthetic stimuli. This suggests that reasoning for practice is influenced by a large number of factors. According to Muttiah et al (2011) clinician’s are now integrating client’s views, current research evidence and clinical expertise into decision-making regarding intervention. This evidence is reflected in the development of the super theme as the phrases ‘specific, individual and safety conscious’ regarding practice behaviour illustrates that clinicians are implementing a specific intervention (sensory or chemesthetic stimuli) which is specific to the client and the situation but is also focused on implementing evidence-based practice in ensuring client safety.

4.2 Specific

An interesting result from analysis of data was the specificity of use and this can be seen across a number of themes. Participants reported using specific sensory and chemesthetic stimuli in oropharyngeal dysphagia. The most popular stimuli reported was carbonation, followed by strong and sour. This is significant as there is a growing body of evidence behind the use of carbonation and the sour bolus as a sensory or chemesthetic stimulus (Bulow et al 2003; Krival 2007; Pelletier & Dhanaraj 2006; Sdravou et al 2012; Kajii et al 2002; Logemann et al 1995). This specificity suggests that SLTs in the area of dysphagia are using the sensory or chemesthetic stimulus which has the most research evidence behind it. This implies that evidence-base research does play a part in reasoning of clinical practice.
Participant’s also reported using sensory and chemesthetic stimuli in specific situations, for example after radiotherapy or post surgery. As of yet guidelines for implementation of use of sensory and chemesthetic stimuli have not been introduced and so from this data we can deduce that SLTs in their clinical practice are adopting a trial and error approach to establish what specific situations sensory and chemesthetic stimuli can be used in. This is congruent with the literature as Kamhi (2006) found that SLTs have had to adopt a trial and error approach when implementing therapy.

Participants reported using sensory and chemesthetic stimuli to improve specific areas and situations. Again the common finding here is explicitness of use. Participants reported using these stimuli to improve bolus awareness, manipulation, control and holding. Through targeting this phase clinicians are attempting to adapt the oropharyngeal swallowing process which literature indicates can be adapted through the use of sensory and chemesthetic stimuli (Steele and Miller 2010). From this information we can deduce that SLTs are using evidence-based practice in the management of oropharyngeal dysphagia and they are finding the use of sensory and chemesthetic stimuli to be successful in improving oropharyngeal dysphagia in their clinical practice.

4.3 Individual

Another main theme which developed is that of individuality. It is clear that clinician’s are implementing sensory and chemesthetic stimuli on an individual basis according to specific indications. This is illustrated in the theme of client benefits. A client-centred approach which has long been advocated in therapy across all healthcare disciplines (Law et al 1995; Brown et al 2006) and is implemented in Speech and Language therapy practice through the International Classification of Functioning, Disability and Health (ICF; WHO 2001).

Research shows that oropharyngeal dysphagia is prevalent in the elderly and aging and is often the manifestation of a systematic disease or neurological impairment (Cook and Kahrilas 1999). The clinical practice of dysphagia management is carried out on an individual basis as participants reported working with a wide variety of populations and no-one stimuli is suitable for all, for example those with profound
and physical disabilities or those with an acquired neurological disorder. These populations are present in demographic information obtained from this study and from participant’s response where sensory and chemesthetic stimulus was used in the intervention of oropharyngeal dysphagia across a number of populations.

4.4 Safety Conscious
Participants also reported using sensory or chemesthetic stimuli with at risk clients. This illustrates that therapists who use these stimuli are conscious of the evidence-base behind the use of sensory and chemesthetic stimuli as they are implemented to reduce safety risks. Participants are incorporating their understanding of how patients use sensory processing when eating or drinking in dysphagia management and how this can adversely affect anatomical structures and processes during the stages of the swallow.

The implementation of a safe intervention for patients is also facilitated through the theme of exploration as participants reported exploring different areas e.g. in the oropharynx and oral cavity and for the presence of pharyngeal residue. Research shows that areas of dysfunction in oropharyngeal dysphagia can include residue in the pharyngeal cavity (Cook and Kahrilas 1999). Participants therefore report using these stimuli to assess whether dysfunction is occurring in this particular area as a result of oropharyngeal dysphagia and to establish if the use of the stimuli aids in swallow safety.

4.5 Lack of knowledge
Rappolt and Tassone (2002) found that clinicians may lack the relevant skills to implement evidence-based practice. This finding is concurrent with the findings of this study as a significant barrier to the implementation of sensory and chemesthetic stimulus in dysphagia therapy was a lack of knowledge and a lack of training. McCurtin and Roddam (2012) highlight the importance of targeted training to provide clinicians with a specific set of skills. This lack of targeted training and the development of specific skills is inhibiting the use of sensory and chemesthetic stimuli in dysphagia intervention. Participants who do not use sensory and chemesthetic stimuli cite a lack of knowledge, (due to a lack of training) as a reason for non-use. Demographic information from this study also shows that over 50% of participants
have been working with dysphagia for over 10 years. This information coincides with the theme of a lack of training as clinicians have been out of college for at least 10 years and may not have been on dysphagia training courses since that time.

4.6 Procedure

Procedure can be described as a barrier to the implementation of sensory and chemesthetic stimuli for a number of reasons. Participants reported that the use of these stimuli is not a definite part of dysphagia management and reported difficulty objectively assessing the effectiveness of the use of these stimuli. This suggests that participants require a clear-cut approach to the management of dysphagia and would not explore these stimuli without specific guidelines or procedures being implemented. This is contradictory to the findings of Zippoli and Kennedy (2005) who found that clinical practice guidelines did not have a significant role to play in the implementation of evidence-based practice.

Participants reported not using these stimuli due to a lack of evidence. Mullen’s (2005) survey also found that the most common barrier to the use of research in practice is a lack of relevant evidence. However literature shows that other dysphagia therapies (e.g. rehabilitative strategies and diet modifications of texture and viscosity) have varying outcome results in therapy (Speyer et al 2010).

The barriers of procedure and a lack of knowledge in the area of sensory and chemesthetic stimuli would imply that in clinical practice clinicians are using interventions according to clinician preference rather than evidence-based practice as cited by McCurtin and Roddam (2012). While a lack of knowledge and training is a significant barrier to the implementation of sensory and chemesthetic stimuli in dysphagia management this could be overcome by adopting a trial and error approach if safe to do so.

Ross (2006) found that a barrier to the successful implementation of evidence-based practice was a culture of using traditional methods. From the reporting of participants this would appear to be the case as SLT’s who participated in the study and did not use sensory or chemesthetic stimuli appear resistant to a change of therapy procedures which has not been founded as a definite part of dysphagia management or with a specific set of guidelines.
4.7 Practicality

The issue of practicality is another barrier to the successful implementation of sensory and chemesthetic stimuli in the management of oropharyngeal dysphagia. External factors, outside of the clinician’s control are prohibiting the use of sensory and chemesthetic stimuli. Issues such as a lack of time and caseload pressures are barriers to the use of said stimuli in the management of oropharyngeal dysphagia. Similar findings have also been found in other studies as barriers to the implementation of evidence-based practice (O’Connor and Pettigrew 2009; Zippoli and Kennedy 2005). The issue of a lack of practicality can also be seen as a lack of resources available to clinicians. Without a variety of resources the introduction of evidence-based practice, specifically that of sensory and chemesthetic stimuli cannot occur. This finding is similar to that of Stephens and Upton (2012) who found that barriers to evidence-based practice include a lack of time, resources, skills and understanding.

4.8 Implications for Therapy

From the information yielded in this study, it appears essential that the themes which developed for non-use of sensory and chemesthetic stimuli are addressed so that SLTs can make reasonable decisions when planning intervention in oropharyngeal dysphagia. It is also important to acknowledge that the majority of respondents reported using sensory and chemesthetic stimuli in their management of oropharyngeal dysphagia.

4.9 Limitations

Qualitative research is a useful method of collecting research as it allows participants to provide data which has not been influenced by the author's agenda. However there are of course limitations with this type of research, as with all research which must be acknowledged.

One of the limitations is that thematic analysis and thematic coding is an interpretive act and ‘not a precise science’ (Saldana 2009; p.4). As a result of this, results are more easily influenced by the author’s personal biases.
A final limitation is that as there was no interviewer participants could not be probed for more information, or asked to explain a response, for example if an abbreviation was used which wasn’t understood.

4.10 Future Directions

While qualitative research approaches may have limitations it has been beneficial for other studies on reasoning for clinical practice, e.g. McCurtin 2012 (mixed-method approach). This is a companion study to a quantitative study and the combination of both studies should yield a comprehensive overview of the chosen research topic. This present study however yields some useful insights into the reasons for use or non-use of sensory and chemesthetic stimuli in the treatment of oropharyngeal dysphagia.

This study lays the results of participant’s reasoning for use of stimuli and factors which are inhibiting use of these stimuli.

4.11 Summary

The qualitative study presented here provides important insights into the clinicians use of sensory and chemesthetic stimuli, the specific stimuli used and when these stimuli are used. This study also provides an overview of reasons for non-use of these stimuli and factors contributing to a lack of use.

Previous studies cite barriers to implementing evidence-based practice include a culture of using traditional methods (Ross 2006), a lack of relevant skills necessary for implementation (Rappolt and Tassone 2002) and timing pressures (O’Connor and Pettigrew 2009). The present study found that reasons for non-use of sensory and chemesthetic stimuli yielded similar findings to these studies. This suggests that clinician preference and a lack of resources are preventing the implementation of this evidence-based practice in the UK and Ireland. This finding is similar to that of other studies on evidence-based practice (Muttiah et al 2011; Zippoli and Kennedy 2005; McCurtin and Roddam 2012).
5. Conclusion

This qualitative research aimed to explore the reasons for use or non-use of sensory and chemesthetic stimuli in the treatment and management of oropharyngeal dysphagia in the UK and Ireland. A survey methodology was used as a means of data collection. Thematic analysis was used to gain insight into the specific reasons for use or non-use of these stimuli. Thematic analysis was performed on key words taken from the survey and a super theme, main themes and a number of sub themes were generated.

Some of the main points found were that the majority of participants reported using sensory or chemesthetic stimuli in the treatment of oropharyngeal dysphagia. Reasons for use revolved around the themes of client benefits, to improve, appropriateness of use and specifics regarding the type of stimuli used and when it was utilized.

However for those participants who reported not using sensory or chemesthetic stimuli reasons for non-use revolved around the themes of a lack of knowledge, a lack of evidence and external factors contributing to a lack of use. This is an important finding which has implications for intervention as it highlights the need to disable these barriers which prevent successful implementation of evidence-based practice.

Further investigation is warranted in this area to establish the full extent of use of sensory and chemesthetic stimuli. This study had positive findings as the majority of SLT's reported using sensory and chemesthetic stimuli in the treatment and management of oropharyngeal dysphagia.
Acknowledgements:

I would like to express my gratitude and appreciation to Dr. Arlene McCurtin who provided me with invaluable advice during the project and for her continued encouragement, guidance and patience throughout.

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This research study has received Ethical Approval from the Education and Health Sciences Research Committee, University of Limerick.
References


Appendices

Appendix 1: Survey

The use of sensory and chemesthetic stimuli in the management of oropharyngeal dysphagia: scoping practice in the UK and Ireland

1. First, tell us how many years have you worked as a speech and language therapist?
   - Less than 5 years
   - between 5 and 10 years
   - more than 10 years

2. How many years have you worked with clients with dysphagia?
   - Less than 5 years
   - between 5 and 10 years
   - more than 10 years

3. What percentage of your clinical practice is spent working with clients with dysphagia?
   - Less than 25%
   - Between 26% - 49%
   - More than 50%

4. In which country do you practice:
   - England
   - Northern Ireland
   - Republic of Ireland
   - Scotland
   - Wales
5. Which age group does your clinical dysphagia work mostly involve:

- [ ] Adults
- [ ] Children
- Other (please specify)

6. Please identify the main dysphagia client group you work with:

- [ ] Acquired neurological disorders
- [ ] Autism spectrum disorders
- [ ] Dysphagia post cancer
- [ ] Intellectual disabilities
- [ ] Physical disabilities
- [ ] Profound and multiple disabilities
- [ ] Progressive neurological disorders
- [ ] People with dementia

Other (please specify)

7. If you work frequently and equally with more than one client group, identify those groups here:

8. Bolus modification is defined as "an approach that amounts to adjusting parameters such as viscosity, volume, temperature, and/or acidity of the bolus" (Speyer et al 2010). When assessing clients with dysphagia, do you use bolus modification techniques?

- [ ] Frequently
- [ ] Occasionally
- [ ] Never

9. When treating clients with dysphagia, do you use bolus modification techniques?
10. Chemesthetic refers to the chemical properties of a stimulus. Examples include "the sensation of carbonation in a soft drink, the hotness of a chilli or the coolness of menthol" (Pelletier & Dhanaraj 2006).

Sensory refers to the sensory properties of a stimulus. Examples include the bitterness of coffee and the sourness of lemon.

When assessing clients with dysphagia, do you use sensory and/or chemesthetic stimuli?

- Frequently
- Occasionally
- Never

*  

11. When treating clients with dysphagia, do you use sensory and/or chemesthetic stimuli?

- Frequently
- Occasionally
- Never

*  

12. Which sensory or chemesthetic stimuli do you use in assessing and/or treating clients with dysphagia? Tick the yes or no box.

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
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<tbody>
<tr>
<td>Sour tastes</td>
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<tr>
<td>Sweet tastes</td>
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<td>Bitter tastes</td>
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<td>Salty tastes</td>
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<td>Umami tastes</td>
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<td>Carbonation</td>
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<td>Chalky flavours</td>
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<td>Spicy flavours</td>
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<td>Menthol flavours</td>
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<td>Kokumi flavours</td>
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<td>Fatty tastes</td>
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<td>Smoky tastes</td>
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<td>Metallic tastes</td>
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<td>Herbs</td>
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<td>Perfumes foods</td>
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<td>Alcoholic flavours</td>
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<td>Specific strong tasting or pungent food</td>
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<td>Specific bland or neutral flavoured foods</td>
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</table>

Other (please specify)

13. If you use sensory or chemesthetic stimuli in your management of dysphagia, please tell us why you use such techniques (max 400chars).

14. If you do not use sensory or chemesthetic stimuli in your management of dysphagia, please tell us why you do not use such techniques (max 400chars).
If you do not use sensory or chemesthetic stimuli in your management of dysphagia, please tell us why you do not use such techniques (max 400chars).

15. Tell us what you personally think of the foods and flavours below.

<table>
<thead>
<tr>
<th>Love it</th>
<th>Neither love it nor hate it</th>
<th>Hate it</th>
<th>Never tried it/don't know</th>
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<tbody>
<tr>
<td>Fudge</td>
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<td>Raw garlic</td>
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<td>Black pepper</td>
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<td>Cooking oil</td>
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<td>Tonic water</td>
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<td>Soy sauce</td>
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<td>Raw fennel</td>
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<td>Mints</td>
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<td>Red meat cooked rare</td>
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<td>Cream</td>
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<td>Pure lemon juice</td>
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<td>Love it</td>
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<td><strong>Vanilla</strong></td>
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<td><strong>Rosemary</strong></td>
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<td><strong>Unsalted margarine</strong></td>
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<td><strong>Raw jalapeno pepper</strong></td>
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<td><strong>Natural yoghurt</strong></td>
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<td><strong>Sparkling water</strong></td>
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<td><strong>Beer</strong></td>
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<td><strong>Vinegar</strong></td>
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<td>Chilli powder</td>
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Thank you for taking the time to complete this survey!

Done
Appendix 2: Information Sheet

INFORMATION SHEET
The name of this study is:
'The use of sensory and chemesthetic stimuli in the management of oropharyngeal dysphagia: scoping practice in the UK and Ireland'

The purpose of this information sheet is to give you the information about our study so you can make an informed choice to participate or not. We are MSc students from the University of Limerick who are conducting some research on sensory and chemesthetic stimuli in the treatment of oropharyngeal dysphagia. Will you consider sharing your clinical expertise for research purposes? To participate you must be a speech & language therapist who works with clients with dysphagia /eating, drinking & swallowing problems.

As part of this research we are interested in finding out what sensory and chemesthetic techniques dysphagia clinicians are using. You will be asked to complete a short electronic survey. This survey has three parts: some questions about your clinical experience, about your clinical practice in this area and a final question about personal preferences. It will take about 10 minutes to complete and is completely anonymous.
How do you participate?
Simply click on the survey-link in this email and start answering the questions.

Any questions regarding this study?
If so, please contact the principal investigator: AMcCurtin 00353 61 234180.

This research study has received Ethics approval from the Education and Health Sciences Research Ethics Committee (2013_10_07_EHS). If you have any concerns about this study and wish to contact someone independent you may contact: Chairman, Education and Health Sciences Research Ethics Committee, EHS Faculty Office, University of Limerick, Tel 00 353 (061) 234101
Appendix 3: Copy of email to SIG members

To whom it concerns,

My name is Joanne Mannion and I am currently completing my final year project entitled "The use of sensory and chemesthetic stimuli in the treatment of oropharyngeal dysphagia: scoping practice in the UK and Ireland". I am completing this project under the supervision of Arlene McCurtin. I was wondering if you would be able to forward the link for our survey onto your members. The link of the survey will be attached in another email once confirmed.

Thanking you,
Kind Regards,
Joanne Mannion.