Implementation of the International Dysphagia Diet Standardisation Initiative (IDDSI)

Framework: The Kempen Pilot

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Abstract

One of the most common treatments for dysphagia is the provision of texture modified food and

thickened liquids. To improve patient safety, a standardized terminology has been advocated. In

2015, International Dysphagia Diet Standardisation Initiative (IDDSI) Framework was released.

The IDDSI Framework describes texture modified food and thickened liquids for individuals of

all ages, in all care settings and in all cultures. To put the IDDSI Framework into operation, a

pilot site in Kempen Germany volunteered to conduct a quality assurance process to document

IDDSI implementation. The process commenced on the Neurology ward, with findings to inform

roll out to other wards and eventually other hospitals. Through wide stakeholder involvement

using simultaneous top-down and bottom-up approach, and commitment to agreed upon

timelines, the Kempen Pilot achieved implementation at ward level. Practical training,

incorporating the IDDSI framework into a range of communication channels and inter-professional collaboration were key to successful implementation.

Key Words: Deglutition, swallowing, dysphagia diet, texture-modified food, thickened fluid, quality improvement

Introduction

The provision of texture modified foods and thickened liquids is recognized in many countries as one of the most common treatment approaches for people with dysphagia (Cichero et al., 2013). Two systematic reviews of the literature have demonstrated that thickened liquids reduce aspiration risk, and flag that very thick liquids increase the risk of post-swallow residue (Steele et al., 2015; Newman et al., 2016). The Steele et al. (2015) systematic review also demonstrated that thicker and harder food items require greater effort in oral processing and swallowing. Provision of hard or complex textured food to people with dysphagia has resulted in death (Berzlanovich 1999; Berzlanovich et al. 2005; Food Safety Commission Japan, 2010; New South Wales Ombudsman, 2015). For both liquids and food there are varying degrees of texture modification to meet these safety needs.

A number of countries have developed national terminologies to label and define levels of texture modification (National Dysphagia Diet Taskforce, 2002; Atherton et al., 2007; Irish Association of Speech-Language Therapists and Irish Nutrition and Dietetic Institute, 2009; Ministry of Health, Labour and Welfare, Japan, 2009; Wendin et al., 2010; National Patient Safety Agency et al., 2011). The most salient benefit of standardised terminology for texture modified foods and thickened liquids relates to improved patient safety from choking and aspiration, as discussed in detail elsewhere (National Dysphagia Diet Taskforce, 2002; National Patient Safety Agency et al., 2011; Jukes et al., 2012; Cichero et al., 2013). The process of implementing standardised terminology has yielded further benefits of improved communication and collaboration between health professionals (Jukes et al., 2012).

In 2015, an International Dysphagia Diet Standardised Framework, developed by a multi-professional group, was released following a rigorous process of reviewing existing national terminologies, systematic review of research literature as noted above, and survey of over 5,000 international stakeholders (www.iddsi.org). The resulting IDDSI framework is suitable for use with individuals of all ages, in all care settings and all cultures. However, development of a framework is meaningless unless it is operationalized and implemented as intended. In July 2015 Hospital zum Heiligen Geist, in Kempen, Germany kindly agreed to embark on a quality improvement project to be the premier pilot site to test the feasibility and implementation logistics of the IDDSI framework. The project became known as the 'Kempen Pilot' study.

The aims of the Kempen Pilot study were as follows:

- To identify the functional logistic requirements of implementing the IDDSI framework and terminology
- To improve quality assurance practices and safety for dysphagia diets using the IDDSI framework and standardised terminology
- To identify and develop guidelines/resources to facilitate and inform future pilots and IDDSI framework implementation

Methods

Hospital zum Heiligen Geist is a 250 bed hospital in Kempen, Germany. There is no existing German national terminology or standardized framework for texture modified foods and thickened liquids. Consequently, hospitals and regions are free to use terminology for texture

modified foods and thickened liquids that best suit their individual or collective purposes. Hospital zum Heiligen Geist is one of 10 hospitals within the Artemed group.

Preparation

Planning and preliminary steps for IDDSI implementation commenced in May 2015 led by the Chief Speech Pathologist (SS) and the Team Lead Speech Pathologist (RZ). Over two months the Speech Pathologists provided nursing training around dysphagia screening and dysphagia pathway management, and this included the importance of diet standardisation. Concurrently, the Chief Speech Pathologist shadowed the Head Chef for a day in the kitchen to understand more about kitchen processes. Terminology classification systems operating within Germany, the UK Diet Standardised Terminology (National Patient Safety Agency et al., 2011) and IDDSI terminology (Cichero et al., 2016; IDDSI 2017) were reviewed and compared, with a decision to adopt the IDDSI terminology. With this step complete, a quality assurance study and pilot implementation project plan were presented to the Board of Hospital zum Heiligen Geist (Kempen, Germany) with institutional approval to proceed received in July 2015. The Chief Speech Pathologist (SSt) was appointed as the project lead and on-site liaison officer. A two prong implementation approach was adopted with the Chief Speech Pathologist working 'top-down' (CEO to Chef and kitchen), whilst the Team Lead Speech Pathologist (RZ) worked 'bottom-up' with nursing, allied health and care staff at ward level.

Service evaluation

A review of existing services was determined as the first step and in July 2015 PL, IDDSI Co-chair and registered Dietitian with concurrent food service expertise conducted a review of current services and agree to support the implementation process. In order to facilitate change

management the project team determined that whilst the review of existing services would cover all food services, implementation would commence on one ward (Department C1 – a 22 bed Neurology ward), with learnings from the experience used to facilitate roll out to other hospital wards, and finally roll out to other hospitals within the Artemed group, to which the hospital belongs. The review covered food services, food production, meal tray assembly and delivery. Observations, interviews and discussions were conducted with the department medical consultant, speech language therapists, dietitian, nursing staff, hospital executives, executive chef and food services staff to gather information about current operations and desired outcomes of the operational review. Sample dysphagia diet test trays were evaluated against existing hospital standards and IDDSI standards. The following clinical-to-food service interface areas were reviewed:

- Existing dysphagia diet and thickened liquid terminology, definitions, food/liquid lists and production guidelines

- System for ordering and delivering texture modified foods and liquids

- Communication systems between the prescribing clinician and food services

- Physical production and assembly process of texture modified foods and thickened liquids

- Quality assurance guidelines/tests in place for texture modified foods and thickened liquids

- Evaluation of sample test trays against the IDDSI framework and descriptors

Following review of existing services, recommendations were made to enable implementation of the IDDSI framework. The IDDSI framework (see Figure 1) and descriptors were translated into German. Reviews at three and six months post evaluation were recommended. Time frames, enablers and solutions to barriers were monitored as part of the review process.
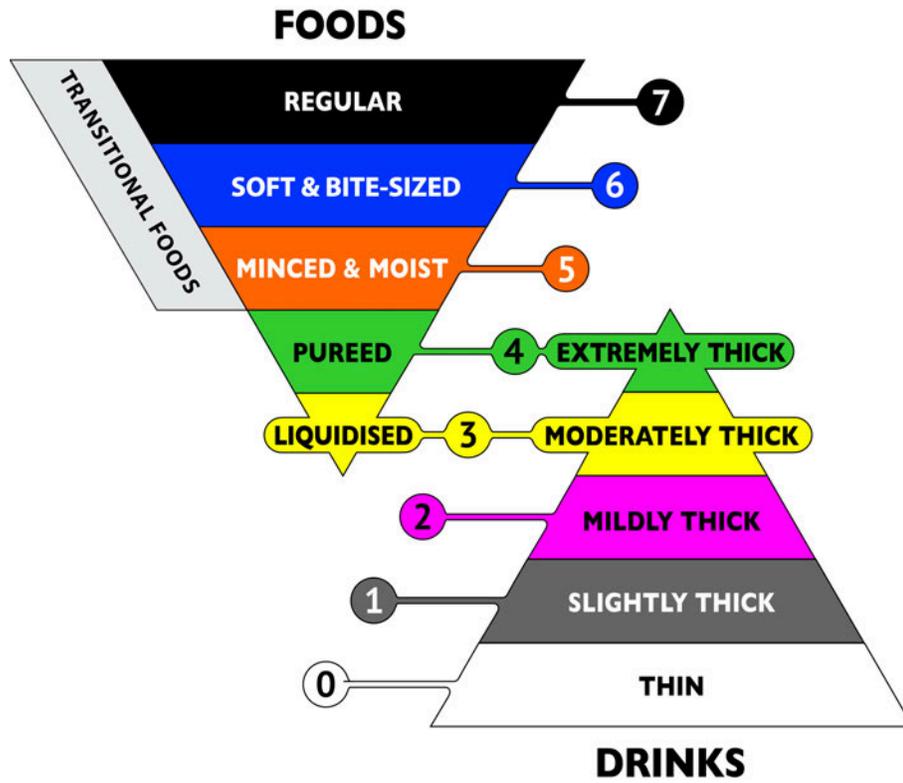

Figure 1. IDDSI framework indicators and descriptors

Results

   Operational review of existing services

Hospital zum Heiligen Geist has a longstanding functional diet order and food services system. There is an existing diet order for texture modified foods showing four levels of modification (Phase I Passierte Kost = Pureed; Phase II Weiche Kost = Soft; Phase III Adaptierte Kost =

Modified regular and Phase IV Vollkost = Regular) however, operationally the kitchen only provides a "soft" and a "puree" diet. The soft diet is a modified version of the regular diet, where some of the harder-to-chew items have been removed following discussion of tray line staff and tray line controller. Pureed foods are commercially sourced (www.soft-meal.de) and thickened liquids are produced at hospital ward level by nursing staff. All patient dietary information (e.g. food texture requirements food allergy/intolerance needs) is recorded on a master diet plan (*Essensplan*)

Following tray line production in the kitchen, meals are delivered to the ward by cart. Nurses review meal trays and may request new meals from the kitchen if the tray was (a) not what was ordered or (b) not what the patient should have. The executive chef estimates that 20-25 trays daily need to be re-plated due to: incorrect orders, assembly issues, patients moving to a different ward or discharge from hospital. This results in a cost of ~ €1,000/month based on meal costs of €4.50-6.50/meal.

Looking specifically at Department C1 (Neurology), with no standardized terminology for texture modified food, dysphagia diets are ordered, assembled and delivered at the discretion of food services staff, tray line controller, nursing staff and head nurse. The patient capacity of the ward, the familiarity of staff with patients and the support of family/spouses allow some safeguards for delivery of appropriate therapeutic and texture modified diets. In particular the head nurse routinely conducts a final check on meal trays and removes any unsafe food items from the texture modified meal tray prior to them being delivered to patients.

The audit of texture modified meal trays using the current hospital system revealed some inconsistencies in the texture of food items provided. For example, items such as cheesecake

were included on a "puree" diet tray. The meal delivery time frame was also found to be an important factor in final food texture. For example, a tray of texture modified food delivered to a patient but left uncovered for over 10 minutes prior to consumption had become hardened, and without reheating was a potential choking risk.

Recommendations to enable implementation of the IDDSI framework

After reviewing the existing services, the following were recommended to enable implementation of the IDDSI framework: staff education, enhanced communication, review of existing menu items to determine which ones met IDDSI framework qualifiers, and adoption of the IDDSI colours, numbers and descriptions for all facets of food service preparation to food service delivery. Implementation of the IDDSI framework in areas of key communication (e.g. patient white boards, meal tray cards) was promoted utilising IDDSI standardised labels, colours and numbers to help staff quickly identify patients who required texture modified food and/or thickened liquids. Across the whole change management process, it was recommended that IDDSI education sessions be provided to nursing, therapy and food service staff. Collaboration and communication between food services and clinical staff was identified as key to successful implementation of the IDDSI framework and holistic adoption. Six and 12 month implementation reviews were also recommended. Specific recommendations are shown in Table 1.

Table 1: Recommendations to assist IDDSI implementation and change management

Recommendation	Action	Factors affecting guideline implementation
Increase visibility of IDDSI system	• Production of posters or photos of texture modified food at each level of food texture modification offered by the hospital • Production of IDDSI colour/number sticker labels that could be applied to patient cardex, Essenplan and meal tray cards • Use of IDDSI colour/number on patient communication systems (e.g. ward white board) • Use of IDDSI terminology in medical chart notes	Organizational support and Practice System factors
Identify existing meals or liquids that *do not* need to change	• Use the IDDSI testing methods to evaluate all existing meals to identify meals or liquids that already meet the IDDSI standards for each level • Re-label using IDDSI labels, colours and numbers to help transition process	Change process factors
Kitchen: operational	• Reorganisation and stocking of tray line stations and assembly of	Organisational; practice

organization of tray line to support IDDSI framework	meal trays using IDDSI labels, colours, numbers	system and change process factors
Implement use of IDDSI flow test to check the thickness level of thickened liquids prepared on the ward	• Speech Therapy and Nursing staff work together to conduct testing on thickened liquids made up on the ward using the IDDSI flow test prior	Organisational; practice system and change process factors
Staff education	• Nursing, medical, allied health (therapy) and food services staff	Individual factors
Opportunities for improved understanding and communication	• Ward staff (nursing, therapy) made aware of kitchen to understand tray line assembly • Kitchen and Food service staff made aware of ward to see what food was like when presented to patient • Diet meetings between chief speech pathologist, dietitian and head chef	Organisational; Practice System factors; Individual factors

Results of the Pilot Implementation Trial

To enhance communication and staff education, the Chief Speech Pathologist and Team lead Speech Pathologist initiated a series of industry-supported workshops that were conducted over August and September 2015. One workshop provided training to nursing and ward staff and focussed on thickening liquids to meet IDDSI standards. A second workshop provided nurses and ward staff the opportunity to match food staples, cultural food items and food commonly brought in by family to IDDSI descriptors. Each workshop had a hands-on practical component, with staff competencies recorded and signed off after each workshop. The third workshop had a maintenance role, reinforcing IDDSI classification of old terminology and the provision of education to new nursing staff. Throughout this time speech pathologists incorporated IDDSI terminology into reports and daily medical progress notes. The IDDSI classification was also incorporated onto the ward communication white board that also contained information regarding patient bed number, diagnosis, mobility needs and daily patient movements. In October 2015 diet meetings were initiated with the Chief Speech Pathologist, Head Chef and Dietitian to receive feedback on implementation to that point. Weekly dysphagia update meetings were also initiated at ward level with nursing staff encouraged to identify patients requiring swallowing review and oral intake charts. Interviews revealed that for clinical staff a deeper understanding of processes in the food service kitchen allowed streamlining of procedures to improve patient safety. For food services staff, an understanding of what happened when the tray left the kitchen until it arrived with the patient highlighted the key role of food services in ensuring that TM foods were correctly and clearly labeled.

A flow chart summarising the steps taken to implement the IDDSI Framework is shown in Figure 2.

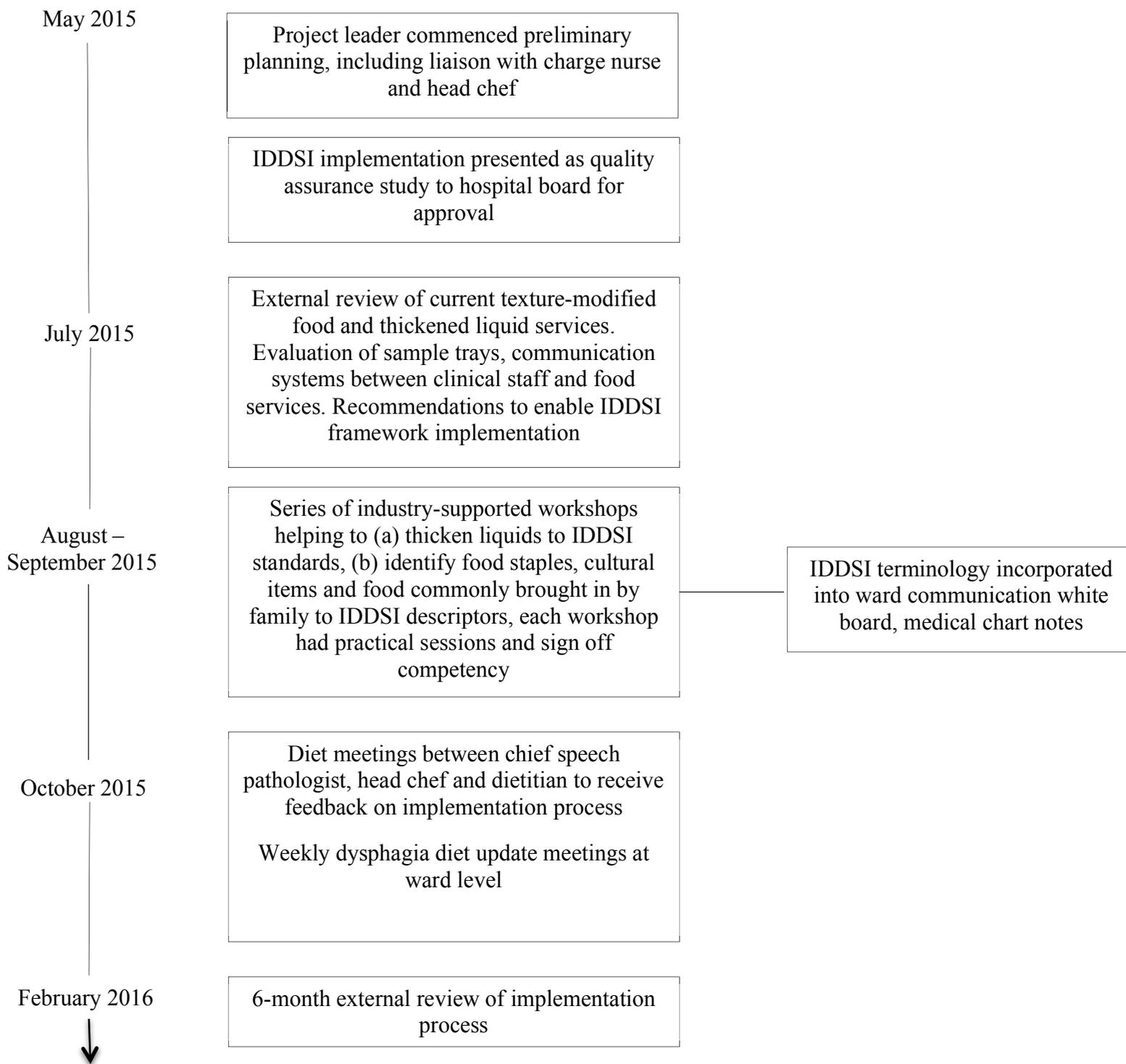|	
May 2015	Project leader commenced preliminary planning, including liaison with charge nurse and head chef
	IDDSI implementation presented as quality assurance study to hospital board for approval
July 2015	External review of current texture-modified food and thickened liquid services. Evaluation of sample trays, communication systems between clinical staff and food services. Recommendations to enable IDDSI framework implementation
August – September 2015	Series of industry-supported workshops helping to (a) thicken liquids to IDDSI standards, (b) identify food staples, cultural items and food commonly brought in by family to IDDSI descriptors, each workshop had practical sessions and sign off competency
	IDDSI terminology incorporated into ward communication white board, medical chart notes
October 2015	Diet meetings between chief speech pathologist, head chef and dietitian to receive feedback on implementation process\n\nWeekly dysphagia diet update meetings at ward level
February 2016	6-month external review of implementation process

Figure 2: Steps taken to implement the IDDSI Framework

A 12 month time frame was initially proposed for implementation, however, the timeline was extended when in October 2015 Germany was inundated with more than 1 million refugees seeking asylum from conflict in Syria, Afghanistan, and Iraq (BBC News, 4 March 2016). At this time hospitals in Germany prepared food for refugees in addition to supporting their patients, and the IDDSI pilot implementation study was suspended. The project resumed in January 2016.

Six month progress review

A six month review was completed in February 2016. The review highlighted key staff changes including new head chef and new dietitian impacting on the timing of uptake of the IDDSI system. Meetings between the Project Officer, the Charge Nurse of C1 and the new head chef regarding implementation of a dysphagia diet system using the IDDSI framework had occurred within the six month time period. A standardized identification scheme had been developed. A white board communication system was in place at the nursing and speech therapy office using IDDSI levels to identify individual patients needing TM diets and thickened liquids. The next step identified was the development of a system to communicate the diet and liquid prescriptions to food service orders. The new Head Chef had undertaken to develop a new menu, matching food texture to the IDDSI Levels with the support of speech therapy staff. The new menus allow for clinical staff to connect the diet prescription information to the food service production/assembly and delivery systems. The card system that accompanied the *Essenplan* was reviewed to see if an existing Artemed corporate food service management software system could be adapted to include the IDDSI framework and descriptors. A new dietitian commenced in September 2016 and was tasked with helping to lead IDDSI education and implementation and be the liaison point between nursing and food services. A random audit of meal service indicated delays of 30-45 minutes between meals leaving the food service area and being

presented to the patient still exist. This delay will impact temperature, quality and texture

behavior of food. For thickened liquids, the IDDSI flow test had been adopted by the speech

therapists when preparing thickened liquids for conducting assessments. This test uses two 10 ml

slip-tip syringes with barrel length of 61.5mm. Correct syringe type is imperative for accurate

results (Cichero et al., 2016). The user loads 10 ml of the sample liquid into the empty syringe

and stoppers the nozzle to impede flow. When ready, the stopper is released to allow flow for 10

seconds. The amount of liquid remaining after 10 seconds of flow is used to clarify liquid

thickness using the IDDSI framework detailed descriptions as follows:

- Level 0 (thin liquid): syringe completely empties within a total of 10 seconds

- Level 1 (slightly thick liquid): 1-4 ml remains

- Level 2 (mildly thick liquid): 4-8 ml remains

- Level 3 (moderately thick liquid): >8 ml remains

Site Visit April 2016

The IDDSI Committee visited the Hospital zum Heiligen Geist in April 2016. Nurses noted the

importance of the colour system in helping them to quickly and easily identify food texture and

liquid thickness needs for patients with dysphagia. Nurses started with labels and included the

framework diagram as a reference beside the main communication board, but their familiarity

with the colours led them to predominantly use these at an operational level. Medical and nursing

staff reported that the intuitive nature of the IDDSI framework had helped promote acceptance of

the framework on the ward. Plans exist to commence using IDDSI symbols at bedside and to

initiate family/carer workshops using IDDSI terminology for patients due for discharge.

Discussion

The Kempen Pilot presents as an excellent example of the use a range of strategies including organizational, practice, process and individual factors for effective guidelines implementation and change management. Within the space of 12 months, organizational support together with collaboration and communication between key stakeholders has resulted in fundamental steps to implement the IDDSI framework at Hospital zum Heiligen Geist. The dual pronged 'top-down' together with 'bottom-up' approach adopted in Kempen has been very successful.

Multi-professional collaboration

Despite a proliferation of guidelines and health care innovations, the process of implementation of best practice is often difficult and poorly examined (Groll & Grimshaw, 2003; Solberg, 2000). Solberg (2000) notes that most research into the process of implementation focuses predominantly on the individual, with little appreciation of the role of the practice organization or the systems change processes. The Kempen Pilot has demonstrated that clear organizational support provided an opportunity for change to occur. The enthusiasm of key champions including the Head Nurse, Head Chef, Chief Speech Pathologist and Team Lead Speech Pathologist allowed for collaboration across the patient care continuum from kitchen to bedside. Jukes et al (2012) reported that one of the key benefits of implementing standardized terminology in Australia was multi-professional collaboration, in that instance most often between Speech Pathologists and Dietitians. Multi-professional collaboration is also advocated by Grol & Grimshaw (2003). The Kempen Pilot, however, is the first to increase the multi-professional circle outside of the health care team to include the Food Service team. Through this multi-professional collaboration, food service staff became more aware of their important role in

providing safety from choking and clinical staff became more aware of the complexities and time pressures in plating meals in the kitchen. This serves to emphasise a point made by Grol & Grimshaw (2003) in that case in relation to compliance with hand washing, in that people become motivated to change when they experience a problem in practice, this then becoming the catalyst to change. It is logical that the entire continuum and staff from Food Service to bed side be included in implementation of the IDDSI framework.

Environmental factors

The Kempen Pilot also highlights the importance of identifying environmental factors that can assist with implementation. The use of IDDSI stickers in key communication areas such as the Essenplan, the patient cardex and meal trays in addition to the ward level communication white board and medical notes provide examples of these. At the six month review the hospital also identified corporate Food Service Management software owned by their parent group Artemed that could be adjusted to include the IDDSI framework. Further to this, there are other opportunities to use computers and software systems to help assist change management. For example, it has been found that the use of computer reminders has had the largest average effect of all interventions for transfer of evidence into practice (Grimshaw et al., 2002). Computer-assisted decision support software using simple prompting has also been identified as another effective strategy for uptake of change (Grol & Grimshaw, 2003). Operationalised for IDDSI, this may mean software that is capable of providing a pop up message when a diet is coded showing the current name of the food and drink and the new IDDSI name.

Individual engagement

Support for change management at the level of the individual is also very important (Jukes et al., 2012). However it is the manner in which individuals are engaged that provides the best change management opportunities and chance of success. Provision of passive education materials and even conference presentations with motivating Continuing Professional Development (CPD) points have provided mixed results for stimulation of uptake of new practices (Grol & Grimshaw, 2003). However, small interactive group discussion and interactive engagement of individuals repeatedly shows positive effects for change management (Solberg, 2000; Wansink, 2002; Grol & Grimshaw, 2003). The success of these types of small group interactive practices and practical hands-on workshops has been ably demonstrated in the Kempen Pilot.

Organisational factors

The role of the organization in providing support for change is identified by a number of authors (Solberg 2000, Grol & Grimshaw, 2002; Jukes et al, 2012). The Kempen Pilot has the full support of the not only the Hospital, but also the Corporate Group to which it belongs. The catalyst for organizational support was initially financial, with re-plating errors costing €1,000/month. Although no critical patient safety incidents (e.g. choking) were identified by the hospital, the same cannot be said of other institutions (New South Wales Ombudsman, 2015). The introduction of IDDSI, an international standardized terminology framework, helps to reduce the risk of death by accidental choking by addressing errors of incorrectly supplied meals. This offers the organization a benefit in reduced liability.

Another benefit of Corporate support found in the Kempen trial is the opportunity to introduce the IDDSI framework progressively, first in one ward, then expanding to other wards before

going hospital-wide and finally group-wide. This type of approach allows for key systems to be established and problems solving to occur, providing a smoother transition and roll out process overall. This type of approach has other precedents as it was used effectively in the development and implementation of the RBWH Nurse Screening Tool for Dysphagia (Cichero et al., 2009).

Wider applicability

Although this study reports on the implementation of the IDDSI framework in a hospital that did not have a national standardized terminology for TM food and thickened liquids, there are leanings from the Kempen Pilot that can be applied to countries that do have their own national standards. Facilities with existing standards may be able to progress faster and utilize existing diet software packages and pop-up reminders to help their staff transition to the new IDDSI framework. The Kempen Pilot has demonstrated that significant change is possible within a six to twelve month period. The development of a plan and timeline for change is clearly important. Changes were able to be effected despite global unrest and the need for the hospital to assume humanitarian duties in the care of refugees. Whilst these external factors may have delayed the timeline, the energy and the drive for implementation of the new IDDSI framework remained.

Conclusions

In conclusion, the Kempen Pilot has demonstrated successful implementation of the IDDSI framework through a cohesive collaborative kitchen to ward interface approach. A combination of organisational support in addition to collaborative work from key stakeholders spanning food service, medicine, nursing, speech pathology and dietetics was important to success of the implementation process. Practical workshops and set milestones for review further assisted the successful implementation process. It is the hope of the International Dysphagia Diet

Standardisation Initiative that the standardised framework and definitions will help not only Hospital zum Heiligen Geist, Kempen, Germany, but also other sites around the world to improve patient safety and quality of care. At the time of writing further pilot sites had commenced in the United Kingdom, Canada and the USA.

Conflicts of interest The authors and IDDSI have no conflicts of interest to disclose

Key Points

- The International Dysphagia Diet Standardisation Initiative (IDDSI) framework provides a common standardized terminology and definitions for texture-modified foods and thickened liquids to improve patient safety and care for individuals with dysphagia.

- The Kempen Pilot (Germany) demonstrated that a top down-bottom up approach, where organisational support is reinforced by local multi-disciplinary champions, allowed for progressive introduction of the IDDSI framework within 6 months.

- Collaboration from kitchen-to-ward interface demonstrated the essential role of food service staff together with medical, nursing, speech pathology and dietitian support in implementation of the IDDSI framework.

- Practical interactive engagement workshops and regular discussions provided the opportunity for smooth transition to the IDDSI framework.

- Clear goal setting and timelines allowed for progressive implementation to begin within 6 months of the decision to adopt the IDDSI framework.

References

American Dietetic Association (2002) National Dysphagia Diet: Standardization for Optimal Care. American Dietetic Assocation, Chicago, IL.

Atherton M, Bellis-Smith N, Cichero JAY, Suter M (2007) Texture-modified foods and thickened fluids as used for individuals with dysphagia: Australian standardised labels and definitions. Nutr Diet 64: S53-S76.

BBC News (2016) Migrant crisis: Migration to Europe explained in seven charts. http://www.bbc.com/news/world-europe-34131911 Accessed 26 August, 2016.

Berzlanovich AM, Muhm M, Sim E, Bauer G (1999) Foreign body asphyxiation-an autopsy study. Am J Med 107: 351-355.

Berzlanovich AM, Fazeny-Dorner B, Waldhoer T, and Fasching P (2005) Foreign body asphyxia: A preventable cause of death in the elderly, Am J Prev Med, 28: 65-69.

Cichero J, Heaton S, Bassett L. (2009) Triaging Dysphagia: Nurse screening for dysphagia in an acute hospital. J Clin Nurs 18: 1649-1659.

Cichero JA, Steele C, Duivestein J et al (2013) The Need for International Terminology and Definitions for Texture-Modified Foods and Thickened Liquids Used in Dysphagia Management: Foundations of a Global Initiative. Curr Phys Med Rehabil Rep 1: 280-291. https://link.springer.com/article/10.1007/s40141-013-0024-z

Cichero JAY, Lam P, Steele C et al (2016) Development of international terminology and definitions for texture-modified foods and thickened fluids used in dysphagia management: The IDDSI Framework. Dysphagia 32: 293-314. https://link.springer.com/article/10.1007/s00455-016-9758-y

Food Safety Commission of Japan (2010) Risk assessment report: Choking accidents caused by foods. https://www.fsc.go.jp/english/topics/choking_accidents_caused_by_foods.pdf Access date: June 21, 2016.

Grimshaw J, Eccles M, Walker A, Thomas R (2002) Changing physician's behaviour: What works and thoughts on getting more things to work. J Cont Educ Health Prof 22: 237–43.

Grol R & Grimshaw J (2003) From best evidence to best practice: Effective implementation of change in patients' care. Lancet 362: 1225-1230.

Irish Association of Speech-Language Therapists and Irish Nutrition and Dietetic Institute (2009) Irish consistency descriptors for modified fluids and foods.

http://www.iaslt.ie/newFront/Documents/PublicInformation/Dysphagia/Irish%20consistency%20descriptors%20for%20modified%20fluidsandfood.pdf. Access date: June 21, 2016.

International Dysphagia Diet Standardisation Initiative (2017) What is the IDDSI Framework. http://iddsi.org/framework/ (accessed 27 March 2017).

Jukes S, Cichero JA, Haines T, Wilson C, Paul K, O'Rourke M (2012) Evaluation of the uptake of the Australian standardized terminology and definitions for texture modified foods and fluids. Int J Speech Lang Pathol 14: 214-225.

Ministry of Health, Labour and Welfare. Food for Special Dietary Uses. 2009. Japanese Government.

National Patient Safety Agency, Royal College of Speech and Language Therapists, British Dietetic Association, National Nurses' Nutrition Group, Hospital Caterers' Association (2011) Dysphagia diet food texture descriptions.

http://www.thenacc.co.uk/assets/downloads/170/Food%20Descriptors%20for%20Industry%20Final%20-%20USE.pdf. Access date: June 21, 2016.

Newman R, Vilardell N, Clave P, Speyer R (2016) Effect of bolus viscosity on the safety and efficacy of swallowing and the kinematics of the swallow response in patients with oropharynegal dysphagia: White paper by the European Society for Swallowing Disorders (ESSD). Dysphagia. 31(2): 232-49.

NSW Ombudsman (2015) Report of Reviewable Deaths in 2012 and 2013. Volume 2: Deaths of people with disability in residential care. Crown Copyright Australia.

https://www.ombo.nsw.gov.au/news-and-publications/publications/annual-reports/reviewable-deaths-vol-1/report-of-reviewable-deaths-in-2012-and-2013-volume-2-deaths-of-people-with-disabilities-in-care (acessed 14 July 2016).

Solberg LI (2000) Guideline Implementation: What the literature doesn't tell us. Jt J Qual Improv. 26(9): 525-537.

Steele CM, Alsanei WA, Ayanikalath S et al (2015) The influence of food texture and liquid consistency modification on swallowing physiology and function: a systematic review. Dysphagia 30: 2-26. https://link.springer.com/article/10.1007/s00455-014-9578-x

Wansink B (2002) Changing eating habits on the home front: Lost lessons from World War II Research. Journal of Public Policy & Marketing 21(1): 90-99.

Wendin K, Ekman S, Bulow M, Ekberg O, Johansson D, Rothenberg E, Stading M: Objective and quantitative definitions of modified food textures based on sensory and rheological methodology. Food Nutr Res 54, 2010.