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Triaging for dysphagia in a public hospital medical emergency unit in Gauteng: a pilot study

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Chapter 1

This section provides an outline of the study. It orientates the reader to the content, which draws on current literature and the rationale behind the study. Key concepts and definitions are included.

1.1. Introduction

Eating and drinking are essential as it provides human beings with nourishment, hydration, and is important in social settings. Healthy people can effortlessly swallow up to 1000 times a day (College of Audiologists & Speech Language Pathologist of Ontario [CASLPO], 2007; Pickel-Voigt, 2014). Eating and swallowing are both voluntary and involuntary activities that involve multiple cranial nerves and muscles. The main task of these muscles and nerves is to transport the food from the oral cavity into the stomach and to close the airway during the swallowing act (Matsuo & Palmer, 2008). If the synchronised process of swallowing is lost or impaired it significantly reduces the individual's quality of life (CASLPO, 2007; Pickel- Voigt, 2014).

Swallowing difficulties are referred to as dysphagia. Dysphagia is a common cause of aspiration and aspiration is a common cause of morbidity and mortality, therefore early detection and intervention is imperative (Sharma, Krug & Loranzo, 2000). Early detection of dysphagia has been shown to reduce length of hospitalisation, morbidity, hospital costs and the risk of pneumonia (Schrock, Bernstein, Glasenapp, Drogell & Hanna, 2011; Daniels, Anderson & Petersen, 2013). The current study aimed to determine the feasibility of implementing a doctor administered dysphagia triage checklist for use in the medical emergency unit (MEU) of a public hospital in Gauteng. A dysphagia triage checklist is a cost-effective method that does not require additional personnel or resources. The use of the dysphagia triage checklist would allow for immediate patient identification and timely referral for on-going care. The

triage concept allows for doctors to identify the presence or absence of a problem (dysphagia) and facilitate appropriate referral to a health care professional (speech-language therapists) for further assessment and management (Broussard & Altschuler, 2000; Cichero et al., 2009; Jean, 1990). The use of a dysphagia triage checklist has implications for the safety of oral diets, development of aspiration pneumonia, malnutrition, administration of oral medication and patient prognosis.

The structure of the emergency departments at most tertiary hospitals have moved to becoming more diagnosis specific (i.e. trauma emergency unit (TEU), surgical emergency unit (SEU) and medical emergency unit (MEU)). As dysphagia is associated with a broad range of diagnoses, it would be beneficial to have the dysphagia triage checklist implemented across all units.

1.2. Rationale

Early detection of dysphagia is vital as it improves health outcomes by reducing the length of hospital stay, hospital costs, the risk of pneumonia and associated mortality (Cichero et al., 2009; Daniels et al., 2013; Schrock et al., 2011). The accident and emergency unit is typically the first point of entry to the hospital system prior to admission into the hospital. Emergency departments (EDs) are typically situated within tertiary level hospitals given the speciality of services provided and availability of medical personnel with specialist skill and expertise. These ED's are further split into specialist areas such as medical emergency unit (MEU), trauma emergency unit (TEU) and surgical emergency unit (SEU) (figure 3). This allows for specialist emergency care to be provided to the patient depending on their primary complaint. The trauma load in South Africa is one of the highest in the world (Rosedale et al., 2011). Triaging for dysphagia in the MEU allowed for patients at risk for dysphagia to be identified at the earliest point of medical care and for an early and appropriate referral be made to a speech

therapist. This was important to explore within the South African hospital context due to the limited number of speech-language therapists practicing in the public sector, the working hours in hospital settings as well as the subsequent high patient to speech-language therapist ratio.

As knowledge and awareness around swallowing and swallowing impairments continue to improve, the implications for the caseloads of speech-language therapists employed at South African public hospitals must be considered. Although dysphagia related cases are a priority for hospital-based therapists, it is amongst an assortment of speech therapy services required within a hospital setting, which leads to additional challenges (American Speech- Language and Hearing Association [ASHA], 2013; Health Professions Council of South Africa [HPCSA], 2012; South African Speech-language and Hearing Association [SASLHA], 2009). Some of these challenges include; timing of identification of a swallowing difficulty and the timing of the assessment (Seedat, 2014). As a result, time, human resources and efficiency of services may be compromised for the increasing number of patients who present with dysphagia as well as other speech and language communication disorders. Additionally, the high number of patients with dysphagia has been directly influenced by the increasing prevalence of chronic disorders such as stroke, Human Immunodeficiency Virus (HIV), Acquired Immunodeficiency Syndrome (AIDS), head and neck cancers and degenerative neurologic conditions, all of which are likely to occur as a result of lifestyle changes, eating habits and poor medical follow-up (Blackwell & Littlejohns, 2010; Brainin, Teuschl & Kalra, 2007; Connor et al., 2008; Crary et al., 2013).While exact statistics on the incidence of dysphagia amongst patients who have suffered from stroke in South Africa are not readily available, one may speculate that given the increasing prevalence of stroke, there is likely an increase in associated dysphagia (Connor et al., 2008). Early identification of dysphagia amongst at-risk patient populations may decrease one's susceptibility to co-morbidities

(Hinchey et al., 2005), such as aspiration pneumonia, malnutrition, dehydration, airway obstruction or even death (Perry, 2000).

Triaging of patients is vital in order to ensure that at-risk patients are appropriately identified and referred for further assessment and management (Cichero et al., 2009). Given the key role of doctors in emergency departments (EDs), specifically the medical emergency unit (MEU), enhancing their skills in identifying dysphagia is important. With appropriate training in dysphagia, Cichero and colleagues (2009) successfully integrated nurses and doctors into the critical role of swallow triage. The rationale behind this study by Cichero and colleagues (2009) was to reduce the risk of a patient commencing oral intake inappropriately or unsafely as poor nutritional intake may intensify costs related to recovery and length of stay of the patient. Additionally, hospital costs associated with incorrect diet allocation, food wastage issues and the needs of the sick regarding assistance when eating may be indirectly positively influenced by the implementation of the dysphagia triage checklist (Cichero et al., 2009).

Due to the varying and complex social, cultural and economic circumstances for patients accessing public hospitals in South Africa (SA), additional considerations need to be made regarding the early identification of dysphagia and length of the patient's hospital stay. Particularly, (1) financial implications – patients who are breadwinners of the family need to return to work and increased length of hospitalisation impacts this – and (2) there is an increased likelihood of the patient acquiring other hospital-acquired infections and co-morbidities with increased length of hospitalisation (Ostrofsky & Seedat, 2016). Research has shown that early dysphagia identification provides timely multidisciplinary care to the patient and reduces patient length of stay and complications (Blackwell & Littlejohns, 2010; Heckert, Komaroff, Adler & Barrett, 2009; Marik & Kaplan, 2003). Early detection facilitates optimal management, minimises occurrence of dysphagia-related complications and co-morbidities,

and can improve the prognosis for dysphagia (Blackwell & Littlejohns, 2010; Heckert, Komaroff, Adler & Barrett, 2009; Marik & Kaplan, 2003). Cost efficiency for the hospital and for the patient are important considerations in any resource-constrained and developing context. Thus, dysphagia triaging within accident and emergency units may have a role to play in terms of reducing the implications associated with dysphagia.

While international literature advocates for the use of dysphagia triaging, the environmental and socio-economic context has a role to play in the success of this. The South-African context has a rich and deep-rooted political history which has influenced current health and medical infrastructure and resources. The current study indirectly ascertained if these factors in any way influenced the outcome of implementation of the dysphagia triage checklist.

Chapter 2: Literature Review

This chapter provides some insight into the literature. The South African medical context has been explored and some insights into the current practices have been provided. A description and discussion of dysphagia, symptoms, complications, assessment and treatment has also been provided. Additionally, evidence-based practice has been explored.

2.1. Dysphagia

Swallowing is a complex and continuous activity that involves the smooth and speedy transportation of ingested material and saliva from the oral cavity to the stomach (Koidou, Kollias, Sdravou, & Grouios, 2013). The swallowing mechanism is made up of three anatomically and functionally separated, but integrated areas, namely, the oral cavity, the pharynx and the oesophagus (Ekberg & Nylander, 2012).

The term dysphagia is derived from the Greek roots '*dys'* (difficulty with) and '*phagia'* (to eat) (Koidou et al., 2013). Any disease or injury that affects the brain or nervous system as well as any medical condition resulting in structural changes to the face, jaw, mouth, tongue or neck may have a negative effect on one's ability to swallow (Koidou et al., 2013). Although classified under 'symptoms and signs' in the International Classification of Disease- 10 (ICD-10; World Health Organisation [WHO], 2006), the term is sometimes used as a condition on its own. Dysphagia is defined as a disturbance of the intake or transport of food or drink from the mouth to the stomach; it is the disruption of a synchronised activity surrounding the normal swallowing mechanism (Koidou et al., 2013; Prosiegel, 2012).

2.2. Risk Factors

Patients with dysphagia are at a higher risk to develop an aspiration related pneumonia as well as are more likely to be malnourished. This is explained below in greater detail.

2.2.1. Aspiration

"Aspiration pneumonia occurs when gastric content enters the respiratory tract, thus causing 'pathologic chemical reactions' to occur in the 'lung parenchyma'" (White et al., 2008, p16). Aspiration pneumonia is most common in those with oropharyngeal dysphagia (White et al., 2008). It is the most common cause of death in patients with dysphagia (White et al., 2008). Aspiration occurs in just over 50% of cases of dysphagia. It is estimated that 25% of patients with dysphagia progress as far as aspiration pneumonia without showing any overt clinical signs of aspiration (White et al., 2008). This is known as silent aspiration. Five-year mortality rates of approximately 20% have been reported to be related to aspiration pneumonia (Sharma et al., 2000). A preventative measure such as early identification of dysphagia and subsequent identification of aspiration and or silent aspiration is vital given the high incidence. Early identification methods such as dysphagia triaging may be the answer to a dire situation. The implementation of a dysphagia triage checklist as early as admission to the hospital may play a role in reducing the number of patients who progress to the point of aspiration pneumonia as a result of dysphagia.

2.2.2. Malnutrition

"The term malnutrition is defined as an important preventable complication associated with dysphagia and is used to describe a large number of nutritional abnormalities" (Bouziana & Tziomalos, 2011, p.1). "Malnutrition is characterised by a long-standing negative imbalance in energy and protein requirements, with metabolic requirements exceeding nutritional intake, leading to altered body composition and impaired biological function" (Bouziana & Tziomalos,

2011, p.1). A study done on stroke patients showed that dysphagia and tube feeding were strong predictors of malnutrition on admission to a rehabilitation facility (Bouziana & Tziomalos, 2011). Malnutrition may develop as a consequence of dysphagia if nutritional intake is reduced in relation to their requirements. The risk factors associated with malnutrition include chronic diseases, eating difficulties, functional disability, a history of stroke and socioeconomic status (Bouziana & Tziomalos, 2011).

According to Statistics South Africa [STATSSA] (2017), "more than half of South Africans were poor in 2015, with poverty increasing to 55,5% from of 53,2% in 2011". The reason for this increase could be attributed to low and weak economic growth, high unemployment levels, higher cost of living food prices, greater household dependency on credit and political uncertainty (STATSSA, 2017). Research has shown that poverty is highest amongst adults from the age of 55 onwards (STATSSA, 2017). Premorbid malnutrition is expected given the high poverty rate in South Africa (Quarmby and Pillay, 2018). Additionally, people living with disabilities in vulnerable contexts may be predisposed to hunger and malnutrition (Quarmby and Pillay, 2018). Research also shows that premorbid malnutrition is associated with poor prognostic outcomes following a stroke (Bouziana & Tziomalos, 2011). "Malnourished patients with stroke experience more intense stress reactions, show higher rates of pressure ulcers, urinary tract and respiratory infections, and have longer duration of hospitalization and higher mortality rates" (Bouziana & Tziomalos, 2011, p.2). Therefore, given the high rate of poverty and associated malnutrition of a large percentage of the South African population, the decision on how to feed a patient should be made as soon after admission as possible. The use of the dysphagia triage checklist may identify patients at risk of dysphagia. This would result in more timely referrals to a speech therapist for assessment and management of the patient,

which includes referral to a dietician for appropriate and safe diet allocations, so as to not exacerbate the malnourished patients' condition.

2.3. Causes of Dysphagia

Dysphagia is associated with many causes such as neurological, myopathic, metabolic, inflammatory, autoimmune, structural and psychiatric diseases (Koidou et al., 2013). Dysphagia is typically classified as oropharyngeal or oesophageal depending on the location of the swallowing impairment. Table 1 illustrates the causes and symptoms of oropharyngeal and oesophageal dysphagia.

Table 1: Causes and symptoms of oropharyngeal and oesophageal dysphagia (Adapted from Cichero, 2006; Koidou et al., 2013; Prosiegel, 2012; White, O' Rourke, Ong, Cordato, & Chan, 2008)

Phase of Swallow	Causes	Symptoms
Oropharyngeal phase	• Neurological disorders: such as multiple sclerosis, muscular dystrophy and Parkinson's disease • Neurological damage: such as from a stroke, brain or spinal cord injury • Pharyngeal diverticula: a small pouch that forms and collects food particles in your throat • Cancer and some cancer treatments, such as radiation, can cause difficulty swallowing	• Inability to control food or saliva in the mouth • Drooling • Difficulty initiating a swallow • Multiple swallows • Delayed swallows • Coughing • Choking • Breathlessness during meals • Pain on swallowing (odynophagia) • Frequent pneumonia • Unexplained weight loss • 'Gurgly' or wet voice after swallowing • Nasal regurgitation • Feeling of food getting stuck in the throat • Impaired transfer of food from the oral cavity to the oesophagus

Oesophageal phase	• Oesophageal cancer • Candidiasis • Reflux oesophagitis • Effects of medication or anaesthetic agents	• 'Heartburn' • Chest discomfort

Dysphagia is recognised as a disease as well as a symptom that is associated with many disorders and diseases (Cichero, 2006). Impairments fall into the broad classifications of conditions associated with:

- Neurological damage
- Burns
- Trauma
- Respiratory difficulties
- HIV and AIDS
- Surgery
- Tracheostomy

Of the causes listed above, a few medical causes of dysphagia will be explored in detail, as they are relevant for the South African context and admissions into the MEU. As mentioned in the rationale, given the increase in trauma related injuries in South Africa (such as motor vehicle accidents, gunshot wounds, and pedestrian vehicle accidents) the TEU would also be an appropriate site to triage dysphagia in. However, these traumatic diagnoses will not be described in detail, as the trauma unit was not included as a site of triage implementation in the current study. For the current study, triaging in the MEU only was explored and not the trauma or surgical emergency units. Thus, only disorders seen within the MEU specifically will be discussed in relation to dysphagia.

2.3.1. Dysphagia and cerebrovascular accident

Stroke or a cerebrovascular accident (CVA) has an annual incidence of 280 in 100,000 (Cichero, 2006). A South African study conducted in Limpopo revealed that the prevalence of stroke was 300 in 100,000 with the prevalence higher in females than in males (Connor & Bryer, 2006). Cerebrovascular accidents are the second most common cause of death worldwide, with two thirds of death occurring in developing regions of the world such as sub-Saharan Africa (Connor & Bryer, 2006). Strokes are characterized by a sudden onset and signs and symptoms that are focal and last longer than 24 hours (Cichero, 2006). The burden of stroke includes mortality, the long-term outcome of patients and the cost or economic burden in terms of the impact on the health system (Connor & Bryer, 2006).

Oropharyngeal dysphagia occurs in up to a third of patients presenting with unilateral hemiplegic stroke (Cichero, 2006). In a study by Cichero (2006), 34,7% of 406 patients with stroke presented with dysphagia. The incidence of dysphagia in patients with acute stroke varies according to the manner and timing of screening, ranging from 67% when screened during the first 72 hours to 43% within seven days (Arnold, 2016; Cichero, 2006). The most common dysphagia symptoms associated with stroke include (Cichero, 2006):

- Delayed or absent swallow reflex
- Decreased control of the tongue
- Reduced pharyngeal contraction
- Reduced hyo-laryngeal excursion

These symptoms usually occur in combination. The symptoms contribute to post-stroke aspiration in 40% of cases (Cichero, 2006; Gordon, Hewer & Wade, 1987).

2.3.2. Dysphagia and respiratory difficulties

Muscles of the lips, face, tongue, pharynx, larynx, and oesophagus are active during breathing and swallowing and have purposes of airway patency and protection, as well as bolus propulsion. Dysphagia and the causes may affect these muscles and surrounding connective tissue thus leading to reduced bolus flow and airway invasion (Cichero, 2006). Literature suggests there is a synchronised and well-coordinated relationship between respiration and oropharyngeal swallowing in healthy adults, which is crucial for the safe transit of food to the stomach (Cichero, 2006; Martin-Harris, 2008). Healthy individuals exhale prior to swallowing, have a period of apnoea during the swallow to protect the airway, and then resume respiration in the expiratory phase (Cichero, 2006; Selley et al., 1989). Onset of the respiratory pause has been associated with a seemingly protective, momentary medialization of the true vocal folds that is followed by complete vocal fold adduction at some point during hyolaryngeal elevation and excursion (Cichero, 2006). Incoordination results in a dangerously high risk of penetration and aspiration (Cichero, 2006). Initiating swallowing in the expiratory phase allows for significant physiological advantages for hyolaryngeal anterior–superior movement, airway closure, and pharyngeal-oesophageal segment opening (Martin-Harris, 2008). Disruptions between respiration and swallowing in the adult population are associated with conditions such as aging, neurologic disease and head and neck cancers (Cichero, 2006; Martin-Harris, 2008).

The nature of the dysphagia related symptoms in respiratory compromised patients predisposes them to an increased risk of aspiration. Typically, their deficits fall into three broad areas (Cichero, 2006; Martin-Harris, 2000; Martin-Harris, 2008):

- Abnormal eating/swallowing behaviour characterized by aerophagia, anxiety during mealtimes, hypoxia, reduced appetite, frequent expectoration of mucus, and fatigue,

- Reduced airway protection characterized by delayed initiation of pharyngeal swallow, delayed laryngeal closure, premature laryngeal opening, pharyngeal residue, and weakened pulmonary defence mechanisms,
- Impairments in swallowing efficiency characterized by slow and effortful bolus preparation, channelling of food into the pyriform sinuses, oropharyngeal xerostomia, pharyngeal residue and slow oesophageal clearance.

Additionally, the energy needed to breathe increases the patient's metabolic rate and thus increases their caloric needs (Cichero, 2006; Martin-Harris, 2008). These respiratory compromised patients need to eat enough to meet their increased caloric needs, however they often complain that eating is tiring (Martin-Harris, 2008). Therefore, the physiological load placed on the patient during eating and drinking puts further stress on an already compromised respiratory system during mealtimes.

2.3.3. Dysphagia and HIV and HIV $^{+}$/AIDS

The human immunodeficiency virus (HIV) and acquired immunodeficiency syndrome (AIDS) is a serious public health problem (UNAIDS, 2009), with approximately 25,5 million people infected with HIV and AIDS and 700 000 people who have died from HIV related illnesses in Africa in the last year (UNAIDS, 2016). HIV and AIDS have had far reaching consequences for both the scientific and medical sectors throughout the world (Alborough, 2012). Eastern and Southern Africa are the regions from where most of the HIV infected population originates, which constitutes 43% of the HIV population (UNAIDS, 2009; UNAIDS, 2016). Within Sub-Saharan Africa, these HIV and AIDS epidemics vary greatly from country to country. However, in South Africa the levels of people being infected with HIV and AIDS is increasing

and varies within each province with Kwa-Zulu Natal being the province with the majority of HIV infected individuals (UNAIDS, 2009; UNAIDS, 2016).

UNAID (2010) stated that the highest prevalence of the virus in women is between the ages of 25 and 29 whereas for men it is between the ages of 30 and 44. Most people in Africa, who are living with the virus are in the economically productive age group that supports both younger and older generations (Alborough, 2012). There are numerous economic effects that HIV and AIDS can have in a household, some of which include the loss of income of the patients when they are sick, household expenditures may increase, and other members of the family may miss school or work as a result of assisting their sick family member. Furthermore, individuals with HIV and AIDS may also require hospitalisation which is also costly for the country's healthcare sector (Alborough, 2012; Evian, 1992). These factors have a significant effect on HIV/AIDS management in poorer and/or developing countries such as South Africa.

As the central nervous system (CNS) serves as a reservoir for HIV, this can result in neurological complications, thereby causing a possible dysphagia (Brew, 2007). The HIV destroys the immune system of its host and eventually leads to AIDS (Brew, 2007). It also provokes a variety of problems, one of which is dysphagia (Alborough, 2012). Dysphagia in adults who are infected with HIV and AIDS can be triggered by the effects of the virus and opportunistic infections (Alborough, 2012). The HIV and AIDS can affect the oropharyngeal stage in the following ways through opportunistic infections:

- Odynophagia: can occur possibly because of various opportunistic infections which may lead to difficulty swallowing (Alborough, 2012).
- Candida: the fungal infection can spread down into the pharynx which can result in pain and discomfort during the swallow (Anteyi et. al., 2003).

- Neurological conditions: some neurological conditions can result in weakness, delayed and in-coordinated swallow which can lead to aspiration (Brew, 2007).

The oesophageal phase of the swallow may also be affected in the following ways: HIV and AIDS affects the central nervous system by decreasing the functioning of the nerves and musculature involved in the swallow. This presents as weakness, in-coordination, paralysis and decreased sensation of the pharyngeal and laryngeal musculature and can lead to a weak or absent cough reflex, followed by aspiration (Alborough, 2012). Patients who have a decreased level of consciousness will be at risk of aspiration as the patient is often unaware of the food in their mouth, thus disenabling them to control the bolus and initiate the swallow reflex adequately (Miller & Schultze-Delirieu, 1997). In addition, patients who have a CNS infection (such as dementia or meningitis) may have a decreased level of consciousness, which heightens their risk for aspiration (Cichero, 2006). Furthermore, patients can aspirate on their own oral bacteria which will also lead to pneumonia as the bacteria from the saliva that enters the lungs will create an infection (Scannapieco, 1999). Opportunistic infections associated with HIV and AIDS may in addition be associated with dysphagia (Besige et al., 2003).

In addition, dysphagia can lead to malnutrition and weight loss because the patient is unable to eat a wide variety of foods or any food at all (Anteyi et al., 2003). Dehydration can also occur as a side effect of dysphagia either because the patient refuses to drink liquids or because the patient is unable to tolerate liquids and thin liquids have been removed from their diet in order to prevent aspiration (Langley, 1993). It is therefore of great importance that dysphagia in the HIV and AIDS population is managed correctly in order to avoid some or all of the above-mentioned consequences, as these can have significant implications on the patient's quality of life and health (Alborough, 2012).

2.3.4. Dysphagia and traumatic brain injury

Trauma to the head may be classified as ‘open’ or ‘closed’. Open head injuries are those where the brain or meninges are exposed, whereas closed head injuries are those where the meninges are intact even though the skull may be fractured (Cichero, 2006). Trauma to the base of the skull will result in damage to the cranial nerves or their nuclei, where sensory and motor aspects of swallowing may in turn be affected (Cichero, 2006). Despite the diversity of the head injury population, this group presents at risk for dysphagia due to:

- Reduced level of consciousness
- Trauma to the cranial nerves, their nuclei or pyramidal pathways
- Cognitive deficits
- Nasogastric tubes
- Impaired swallowing
- Tracheostomy (Pilitsis & Rengachary, 2001).

Swallowing impairments after a traumatic brain injury (TBI) has been reported to be as high as 60% (Morgan & Mackay, 1999; Pilitsis & Rengachary, 2001). Aspiration pneumonia and gastritis are the most typically reported complications of TBI. Similarly, the incidence of aspiration is reported to be as high as 41% in individuals with head injury (Morgan & Mackay, 1999). Individuals with a severe head injury are more at risk of developing aspiration pneumonia. The most common oropharyngeal difficulties associated with a TBI are:

- Abnormal oral reflexes
- Reduced range of motion (ROM) of the tongue
- Poor coordination of tongue musculature
- Reduced base of tongue strength
- Increased muscle tone of the oral musculature
- Reduced in labial strength

- Reduced soft palate function
- Delayed trigger of the swallow
- Abnormal pharyngeal constrictor activity
- Reduced pharyngeal sensation
- Reduced laryngeal excursion (Morgan & Mackay, 1999).

In summary, given the variety of causes of dysphagia and the potentially debilitating consequences of dysphagia and aspiration. many of these causes described above, are the primary reason for admission to an ED. Hence given this, identification of dysphagia at the entry point would be beneficial.

2.4. Prevalence of Dysphagia

In an American study, Koidou et al. (2013) estimated the prevalence of dysphagia amongst individuals over the age of 50 years, to range from 16% to 22%. Of those over age 60, the reported incidence of dysphagia was between 14% to 40% (Koidou et al., 2013). In healthcare institutions, it was estimated that 12% to 13% of patients in acute hospitals and 30% of patients in rehabilitation centres present with dysphagia (Koidou et al., 2013). Koidou and colleagues (2013) estimated that 20% to 50% of patients who had suffered a stroke or head injury had identifiable signs and symptoms of dysphagia, with up to 80% of patients with degenerative disorders presenting with dysphagia. In 75% of cases of oropharyngeal dysphagia there is a neurological cause such as stroke, dementia or Parkinson's disease (Koidou et al., 2013; White et al., 2008). Dysphagia resulting from stroke is temporary in 90% of cases whereas in patients with dementia and Parkinson's disease, it is part of the general decline (White et al., 2008). Statistics regarding the prevalence of dysphagia in South Africa are not readily available, however it can be speculated that the prevalence would be high given the high incidence and prevalence rate of disorders associated with dysphagia. The benefits of implementing a

dysphagia triage checklist may be twofold; the dysphagia triage checklist may yield data regarding the prevalence of dysphagia as well as play a role in early identification of patients at risk of dysphagia.

2.5. Dysphagia Management

Screening, assessment, diagnosis and management of dysphagia typically falls under the scope of practice of the speech-language therapist due to their training in the anatomy, neuroanatomy and physiology of deglutition (Cichero et al., 2009; Logemann, 1998). The aims and objectives of the speech-language therapists' interventions for dysphagia depend on the type and nature of the dysphagia, the underlying cause, and the needs and preferences of the individual (Cichero et al., 2009). Considering the safety of the swallow, managing aspiration and preventing complications are of utmost importance (Logemann, 1998). According to the international guidelines and scope of practice for speech-language therapists, the overall aims of the speech-language therapist working with an individual with dysphagia include (Logemann, 1998; Speech Pathology Australia [SPA], 2015):

- Screening of all patients at risk of dysphagia before being given food, drink or medication (Screening can be performed by other members of the health care team, such as the nurse or doctor.),
- Comprehensive and detailed assessment leading to accurate diagnosis of dysphagia which may assist with the differential medical diagnosis,
- Ensuring safety by reducing or preventing aspiration with regard to swallowing function,
- Working with other members of the team, such as the dietician, to optimise nutrition and hydration and

- Stimulating improved swallowing with oral motor exercises, swallow techniques and positioning.

However, due to the high patient to therapist ratio, limited resources and late patient referrals, this may not be the exact practice in South African hospitals.

A policy developed by the Royal College of Speech and Language Therapists (RCSLT) in the United Kingdom recommends that there should be at least one full time speech-language therapist per ten beds in every stroke unit (Royal College of Speech and Language Therapists [RCSLT], 2007). Furthermore, the policy suggests that if the ratio of speech-language therapists per 10 patients, falls below this then it would impede timely assessments and follow-up management (RCSLT, 2007). However, speech-language therapists in South Africa comprise a small percentage of practicing health care professionals and often find themselves trying to service large caseloads in a country that has limited resources (Blackwell & Littlejohns, 2010). Additionally, speech-language therapists are most commonly available during regular working hours on weekdays. Thus, nurses and doctors play a pivotal role in patient care and communication between other professionals as they provide 24-hour care. Therefore, a doctor-implemented dysphagia triage protocol in an ED can facilitate prompt management of dysphagia and reduce associated risk factors (Cichero et al., 2009). The South African Speech, Language and Hearing Association (SASLHA) recommend that the management of dysphagia requires multi-disciplinary team (MDT) involvement, with regard to screening, however assessment is within the scope of practice of the speech-language therapist (SASLHA, 2011). The dysphagia guideline advocates for screening procedures to be conducted by other MDT members which includes but is not limited to doctors and nurses (SASLHA, 2011).

2.6. Triaging in the Emergency Department

2.6.1. South African health system

South Africa has a complex health system which consists of a large public sector and a smaller but fast-growing private sector (Jobson, 2015). The public health sector is funded by the state and 40% of all expenditure on health comes from the National Treasury (Jobson, 2015). South Africa's public healthcare system is structured in 4 layers (Figure 1), namely; Primary Healthcare (Clinics), District hospitals, Regional hospitals and Tertiary (provincial tertiary and national central) hospitals (Cullinan, 2006). There are 4200 public health facilities in South Africa (Jobson, 2015).

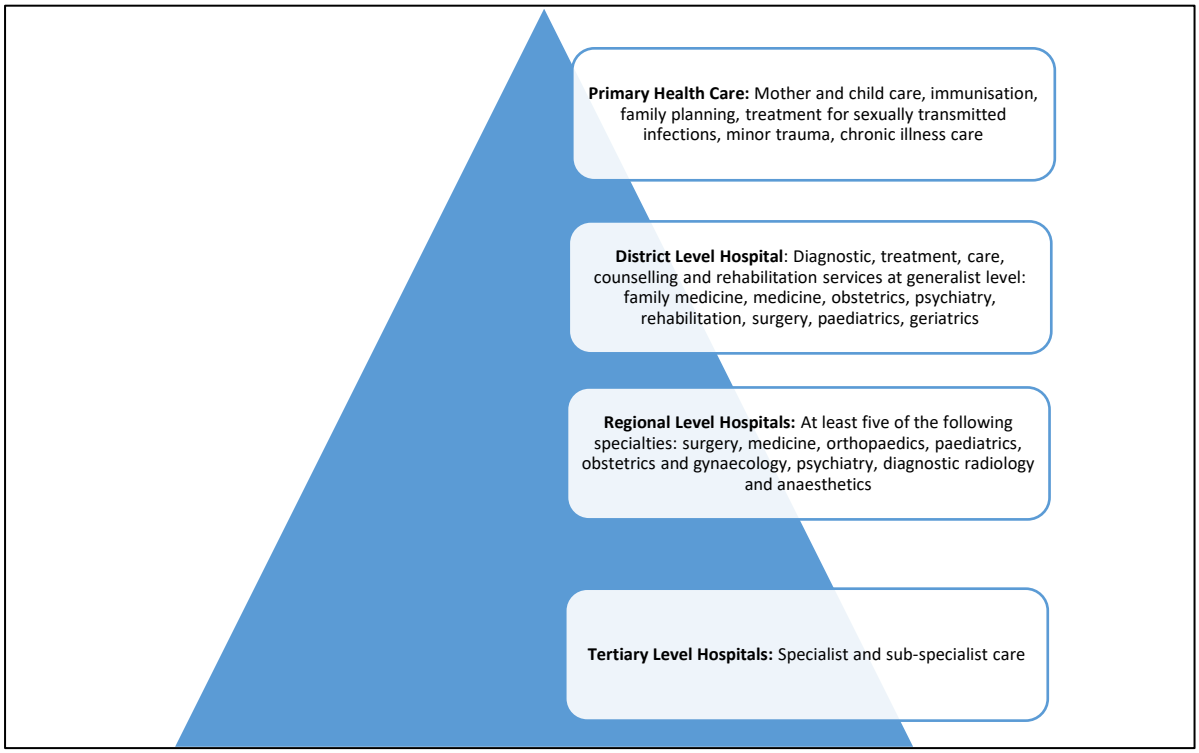


Figure 1: The public healthcare system structure

South African public hospitals are poorly resourced, over-crowded, understaffed and underfunded, contributing to the pressure under which ED's operate (Rosedale, Smith, Davies &Wood, 2011). A tertiary level hospital was therefore the site for the current study. Much of the literature provided in the current study supports dysphagia triaging in EDs. The aim of the

current study was therefore to determine if EDs in the public health care system in South Africa could accommodate an additional procedure. The EDs at tertiary level hospitals appear to be making a shift toward diagnosis specific units (trauma, medical and surgical emergency units) rather than a single unit treating and managing a variety of difficulties. Patients presenting with any medical diagnosis would be treated at the MEU, patients requiring treatment following a traumatic event are treated at the trauma emergency unit (TEU) and all surgical related cases are treated at the surgical emergency unit (SEU).

2.6.2. The South African Triage Scale

The word 'triage' is defined as the sorting of patients in the emergency department according to the urgency of their need for care (Rosedale et al., 2011). An effective triage system is required in order to ensure early recognition of sick patients and prioritization of patients. Emergency departments are built on the concept of triage where all individuals are rapidly screened, sorted and classified to determine priority of need and proper place of treatment (Cichero, Heaton & Basset, 2009). As the patient load is unpredictable in the ED, any ED (medical, trauma, surgical) requires patients to be prioritised in order to manage overcrowding and patient flow problems which could potentially contribute to unsafe situations (Augustyn, 2011). Thus, it is important to identify the critically injured as well as categorise patients in order of urgency to provide safe and efficient emergency care (Augustyn, 2011). This is achieved through triaging. Triaging is recommended for the following reasons (Augustyn, 2011):

- Emergency treatment is accelerated
- All patients are categorised according to clinical status
- Improved patient flow through the ED
- Increased patient satisfaction

- Decreased length of stay in the ED
- Allowance is made for streaming of less urgent patients

The South African Triage Scale (SATS) consists of three age specific tools (adult tool, child tool, infant tool) which assists the healthcare provider to determine the need for emergency care (Augustyn, 2011). Each tool consists of a Triage Early Warning Score (TEWS). The TEWS was designed specifically for the South African emergency care context. The EDs in South Africa deal first hand with the quadruple burden of disease. The quadruple burden of disease includes communicable and non-communicable (chronic - diseases of long duration which are generally slow progression, i.e. cardiovascular diseases, cancer, chronic respiratory diseases, diabetes (WHO,2013) diseases, injuries, HIV and AIDS (Rosedale et al., 2011). The result of which is prolonged waiting times in the ED. While there are existing triage systems which are being used internationally, according to Rosedale et al, (2011), the use of these would require extensive training, have a high failure rate, are labour intensive and those used in developed countries are often not appropriate for use in developing contexts; thus, making them not conducive to the South African context.

The benefit of the SATS is to ensure early recognition and prioritisation of treatment for sick patients treated in South African EDs (Rosedale et al., 2011). The concept of triaging acts as an early warning system for medical patients and assists healthcare providers to intervene earlier (Augustyn, 2011). Triage should be short and concise as per figure 2 (Augustyn, 2011).

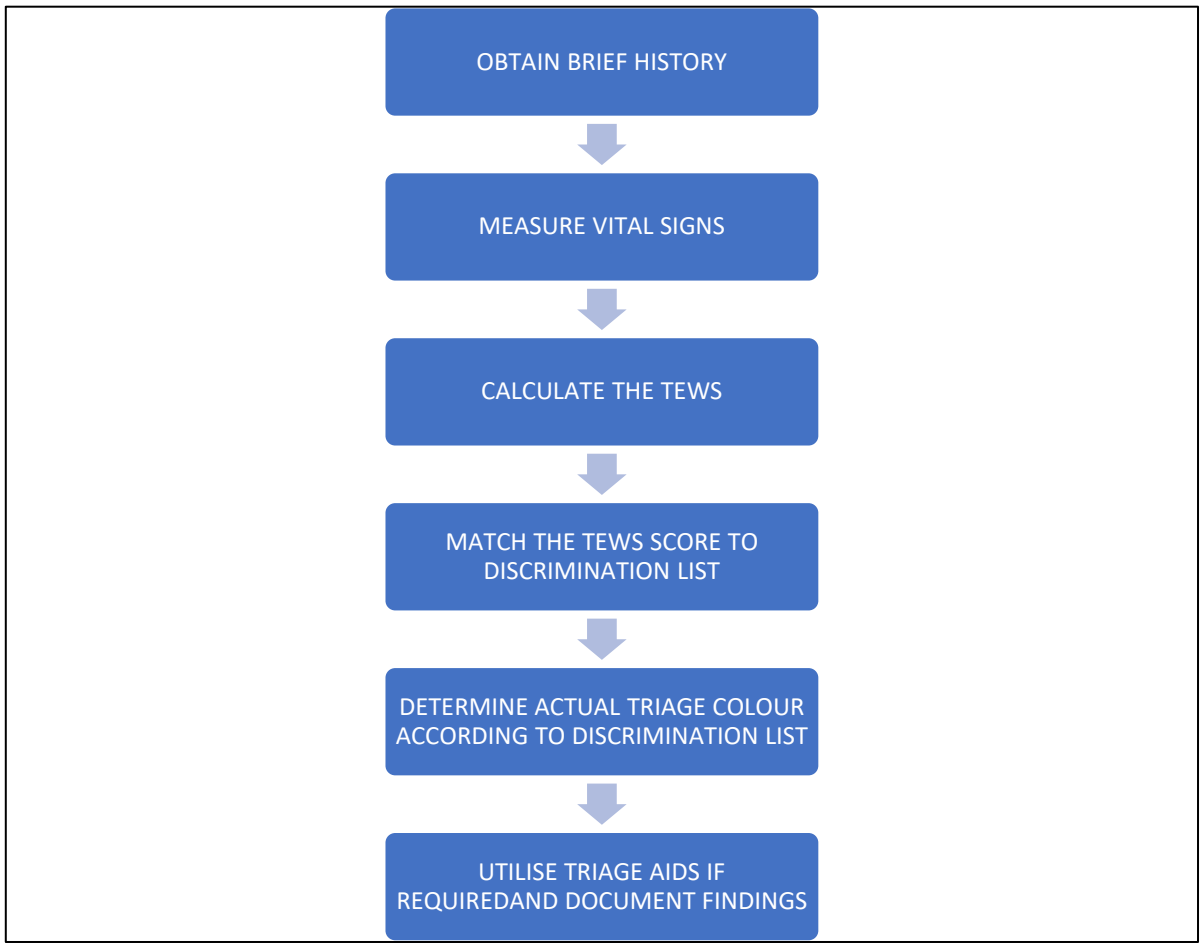


Figure 2: The triage protocol using the South African triage scale

The calculated TEWS score is matched to the colour allocation on the discriminator list and the patient is allocated a colour (Augustyn, 2011). Patients may only be up-triaged and never down-triaged (Augustyn, 2011). Therefore, a patient's initial triage colour may not be lowered to a colour of lesser priority (Augustyn, 2011). The triage colour system is as follows (table 2):

Table 2: The South African Triage Scale colour chart

Colour	Red	Orange	Yellow	Green	Blue
TEWS	7 or more	5-6	3-4	0-2	DEAD
Target time to treat	Immediate	< 10 minutes	< 60 minutes	<4 hours	
Mechanism of injury		High energy transfer			
Presentation		Shortness of breath			
		Coughing blood			
		Chest pain			
		Haemorrhage- uncontrolled	Haemorrhage- controlled		
	Seizure- current	Seizure- post- ictal			
		Focal neurology acute			
		Level of consciousness reduced			
		Psychosis/ aggression			
		Threatened limb			
		Dislocation-other joint	Dislocation- finger/toe		
		Fracture-compound	Fracture- closed		
	Burn-face/ inhalation	Burn - Over 20% - Electrical - Circumferential - Chemical		ALL OTHER PATIENTS	DEAD
		Poisoning/ Overdose			
	Hypoglycaemia- glucose <3	Diabetic- glucose > 11 AND ketonuria	Diabetic- glucose > 17		
		Vomiting-fresh blood	Vomiting- persistent		
		Pregnancy and abdominal trauma or pain	Pregnancy and trauma		
			Pregnancy and PV bleed		
Pain		Severe	Moderate	Mild	
	AT SENIOR HEALTH PROFESSIONALS DISCRETION				

*Note** Table 2 taken from (Austyn, 2011).

The colours are associated with the urgency of medical intervention necessary, with red indicating the need for immediate intervention.

2.7. Evidence Based Practice

Evidence based practice (EBP) is the conscientious use of current best evidence in making decisions about patient care (Drake et al., 2001; Sackett, Straus, Richardson, Rosenberg & Haynes, 2000). An EBP is considered any practice that has been established as effective through scientific research according to a set of explicit criteria (Drake et al., 2001; Sackett et al., 2000). Through incorporating research evidence, clinical expertise and patient values, the speech-language therapist can implement assessment and intervention and make clinical decisions that are scientifically sound (ASHA, 2004).

The effects of dysphagia are well known and can be profound. Although poor nutrition, dehydration, financial costs, poor quality of life and social isolation may be associated with dysphagia, aspiration is the most significant contributor to the decline of a patients' prognosis (Altman, Yu & Schaefer, 2010; White et al., 2008). A well-established best practice in the care of acute patients is the early identification and management of dysphagia. The first step to ensure early detection and to prevent dysphagia related morbidity is to triage all patients admitted to the ED. Speech-language therapists have a limited presence in EDs and are typically only available during working hours on week days. Furthermore, the Health Professions Council of South Africa (HPCSA) (2017) reports that there are 5216 registered speech-language therapists in the country. However, their field of expertise and whether these speech-language therapists are still practicing is unknown. The high patient to therapist ratio may be overcome by introducing dysphagia triage in the ED's of South African hospitals, as has been advocated for by EBP (Cichero, Heaton & Basset, 2009).

2.8. Triaging for Dysphagia in the Emergency Department

As previously mentioned, dysphagia has implications for safety of oral diets, development of aspiration pneumonia, malnutrition and prescription of oral medications (Cichero et al., 2009). As the ED is the common entry point for all patients, it makes sense that dysphagia triaging be performed in the ED (Schrock et al., 2011). Triaging for dysphagia in the ED will allow for the detection of dysphagia at the earliest period of hospitalisation (Schrock et al., 2011) as up to 25% of people in acute hospitals present with dysphagia (Cichero et al., 2009). The literature advocates for dysphagia triaging, however context and environmental circumstances need to be taken into account. The knowledge that early interventions may prevent dysphagia complications leads to the recognition that it would be worthwhile to perform dysphagia triaging in the ED (Barnard, 2011). Personnel in the ED have the potential to affect the patient care in a positive way, advocate for early recognition of the signs and symptoms of dysphagia and potentially guide the management of this disorder (Barnard, 2011). However, the implementation of a dysphagia triaging protocol goes beyond recommendations from international literature and is hugely dependent on the context, particularly in South Africa.

In Australia, The National Stroke Foundation advises that all stroke patients be screened for dysphagia by trained personnel within 24-hours of the stroke and prior to being given food, drink or medication orally (National Stroke Foundation, 2007). In addition, all screened patients are referred to a speech-language therapist for a full swallowing assessment (Cichero et al., 2009; National Stroke Foundation, 2007;). It is important to note that triaging is not a screening practice per se as there are no food trials involved in the dysphagia triage process. While the dysphagia triage study by Cichero et al. (2009) focused predominately on stroke patients, the same practice can be applied for all patients admitted to ED's, as dysphagia may be present in a variety of patient populations (as has been described under the literature review).

2.9. Theoretical Underpinning

The recognition-primed decision (RPD) is a model of how people make quick, effective decisions when faced with complex situations (Klein, 1993). In this model, the decision maker is expected to generate a possible course of action and compare it to the constraints imposed by the situation (Klein, 1993). It functions well in conditions of time pressure, in which information is partial and goals poorly defined (Klein, 1993). The emergency department requires good clinical reasoning skills. The RPD was the most suitable theoretical framework to base dysphagia triaging on as it is characterised by the following:

The RPD model focuses on situation assessment rather than judging one option to be superior to others (Klein, 1993). The doctors in the MEU were able to use their experience with past patients and patient symptomology to make decisions regarding patient management, while being guided by the dysphagia triage checklist. The RPD model focuses on evaluation of options and avoids the need for deliberation between options and that makes the focus of this model on the ‘moment of choice’ (Klein, 1993). This too links to the notion of dysphagia triaging; the triage checklist acts as an assistant in the decision- making process with regard to the wholistic management of the patient at risk of dysphagia. Figure 9 represents the RPD.

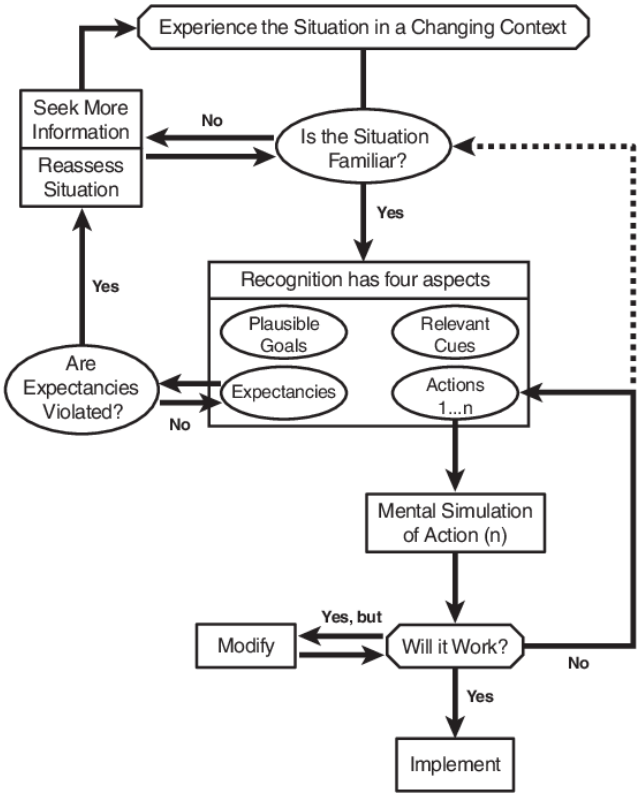


Figure 9: The recognition-primed decision model **(**Klein,1993, p141).

2.10. Problem Statement

The effects of dysphagia are well known and can be profound. Although poor nutrition, dehydration, financial costs, poor quality of life and social isolation may be associated with dysphagia, aspiration is the most significant contributor to the decline of a patients' prognosis (Altman, Yu& Schaefer, 2010; White et al., 2008). Medical emergency units are typically situated within tertiary level hospitals given the speciality of services provided and availability of medical personnel with specialist skill and expertise. However, given that South African public hospitals are poorly resourced, over-crowded, understaffed and underfunded, it remains unknown if a dysphagia triage protocol could be accommodated within the current functioning of the MEU. It is unknown if doctors in the MEU would cope with an additional area of triage, i.e. dysphagia or if they are willing to be called upon to do the triage. Currently no dysphagia

triage protocol exists. The current study therefore aimed to address these research questions. Specifically:

- Is the self-developed dysphagia triage checklist reliable and valid?
- Is triaging for dysphagia feasible within medical emergency units in South Africa?
- How do doctors in the medical emergency unit respond to the use of the dysphagia triage tool?

Chapter 3: Methodology

The following section describes the methodology that was used to answer the research questions and achieve the main research aim. Details regarding the participants, research site, the tools and materials used are described in this chapter.

3.1. Main Aims

The aims of the study were to establish the reliability and validity of a self-developed dysphagia triage checklist and to determine its' feasibility for use by doctors in a medical emergency department in a tertiary level public hospital in Gauteng, South Africa. The study in its entirety was termed a pilot study as the study was conducted in order to evaluate feasibility, time, cost, adverse events of the dysphagia triage checklist.

3.2. Objectives

The following objectives were implemented to assist in obtaining the above-mentioned aims:

- To establish the reliability of the dysphagia triage checklist
- To establish the validity of the dysphagia triage checklist
- To establish the feasibility of the dysphagia triage checklist for use in a medical emergency unit in South Africa
- To describe the viewpoint of doctors implementing the dysphagia triage checklist

3.3. Research Design

The study employed a mixed method research design, more specifically an exploratory sequential mixed method design. This design was adopted due to the multi-dimensional nature of the study. The purpose of the design was to obtain different but complementary data on the

same topic to best understand the research problem (Creswell & Clark, 2007). This design brings together the strengths and weaknesses of quantitative and qualitative methods. Mixed methodologies are typically used when the researcher wants to directly compare quantitative statistical findings with qualitative data (Creswell & Clark, 2007). An exploratory sequential mixed method research design involves a first phase of qualitative data collection and analysis followed by a second phase of quantitative data collection and analysis which builds on the first phase (Creswell & Clark, 2007). The first phase comprised of an observation or ethnographic study of the MEU (qualitative data collection). This then guided the implementation of the dysphagia triage checklist, the dysphagia screening in the MEU and patient record reviews in both the speech therapy department and the MEU (quantitative data collection). Following this, distribution and analysis of questionnaires provided additional qualitative data evaluating the concept of dysphagia triaging in the MEU from the perspective of the MEU doctors. This qualitative phase of the study was designed to follow on from and connect to the results of the quantitative phase. The qualitative phase was necessary as it aided in explaining the quantitative results (Creswell & Clark, 2007). The study was conducted in a deliberate, staged approach with the aim that each stage built upon the previous one until enough data was gathered. Qualitative research aims to give a clear and detailed representation of the quantitative data collected.

3.4. Site

Chris Hani Baragwanath Academic Hospital (CHBAH) was the site for the study. It offers services to patients living in different districts in Gauteng such as Soweto. It is the third largest hospital in the world with approximately 70% of all admissions being emergencies (Mfenyana, n.d.). Accident, emergency and ambulance represent the busiest services, accounting over 350 daily patients. In South Africa, CHBAH epitomizes the reality of patient admission to

emergency units and patient follow-up. Table 3 provides a description of the hospital site with reference to the location, size and facilities; this sets the scene for the current study. Clark-Carter (2010) explained that it is essential that the sample chosen represents the targeted population sample, thus allowing for the inclusion of patients from diverse socio-economic, educational, socio-linguistic and cultural backgrounds. The ED at CHBAH has been divided into three separate EDs, namely trauma (TEU), medical (MEU) and surgical (SEU), as depicted in figure 3.

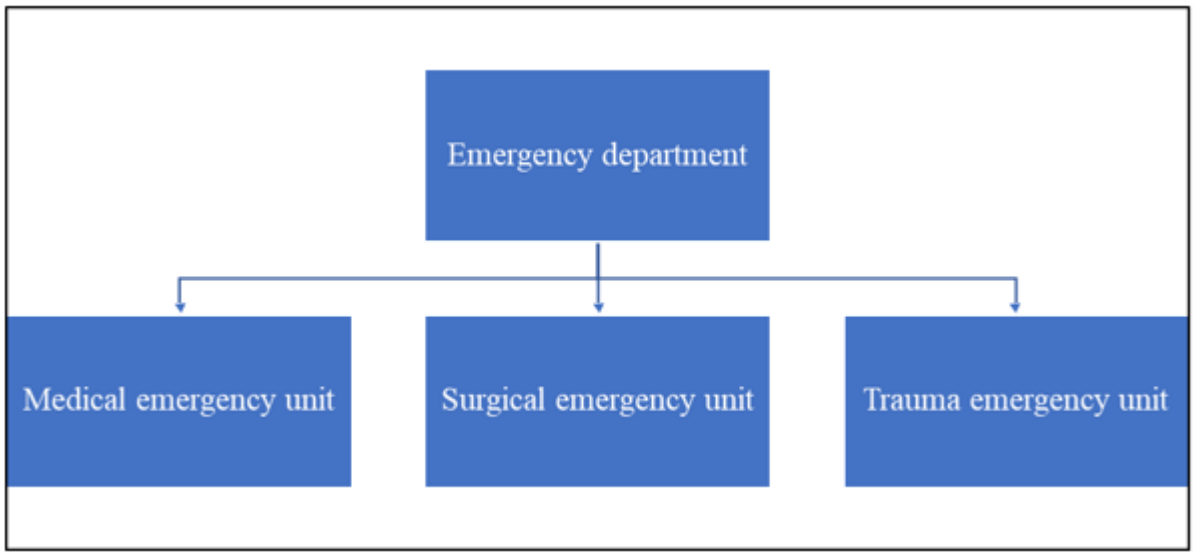


Figure 3: The structure of the emergency department at CHBAH

The current study focused only on patients admitted to the MEU. The MEU at CHBAH is a specialist department at a tertiary level hospital and accommodates patients transferred from Bheki Mlangeni Hospital (BMH). In return patients from CHBAH are stepped-down to BMH. It was not possible for the doctors from the TEU and SEU to consider participation in the study, as the researcher was told up front that the pace of work, and patient load, would not allow the doctors to even consider adding a component to the existing protocol. This was despite being granted consent by management for the study to proceed across the different EDs. This will be

discussed in the discussion section, as this initial challenge was testament to how context is a vital consideration in any research initiative. According to the SATS, the MEU at CHBAH treats patients classified as '*Red'* or '*Orange'*, all other patients are referred to either their local clinic, BMH or to out-patient departments that accommodates the patient's primary complaint.

Table 3: Description of the research site

Name	Location	Size	Facilities
Chris Hani Baragwanath Academic Hospital (CHBAH)	Soweto, Johannesburg	• 3rd largest hospital in the world • Approximately 3200 beds	Human Nutrition; Occupational Therapy; Physiotherapy; Speech Therapy & Audiology; Social Work; Anaesthesia; Burn Units; ICU; Cardiology Unit; Gastroenterology Unit; Psychiatry Unit; Renal Unit; Respiratory Unit; Obstetrics & Gynaecology; Orthopaedic Surgery; Paediatrics; Pharmacy; Radiology & Radiography; Surgery

3.5. Population

3.5.1. Sampling strategy

Purposeful sampling was used to recruit participants. This is a form of non-probability sampling whereby the researcher handpicked the participants based on expert judgement (Salkind, 2006). Additionally, purposeful sampling allowed the researcher to select participants based on specific characteristics or who are most likely to provide useful information to the study. This method of sampling was beneficial in that it was cost and time effective (Gravetter & Forzano, 2012). This method also allowed for the researcher to maximize the number of participants in order to achieve statistical significance as well as make use of a representative

sample of doctors from the MEU. Purposeful sampling is based on the assumption that the researcher wants to discover, understand and gain insight and therefore must select a sample from which the most can be learned (Merriam, 2009). This method of sampling allowed the researcher to have a sample which was representative of the MEU.

3.5.2. Sample

3.5.2.1. Medical emergency unit doctors

Participants were doctors from the MEU. They comprised students, interns, medical officers and consultants working in the medical emergency unit at the time of data collection. The role of the doctors in the MEU is to diagnose and treat acute and urgent illness. Therefore, doctors working in the MEU were selected as they are the first point of call for patients on admission to the hospital. Additionally, doctors were selected as they play an important advocacy role in caring for patients. No distinction had been made between the level of qualification required for participating doctors as this allowed for an accurate impression of regular MEU functioning within the South African public health system.

Inclusion criteria

- Participants were either enrolled medical students or a medical doctor working in the MEU during the time of data collection.

Exclusion criteria

- Participants working outside of the MEU were not involved in the implementation of the dysphagia triage checklist.

3.5.2.2. Patients

The patients were not participants in the study per se. The patients received routine care (medical triage and medical management as necessary) by the MEU doctors. All patients who were treated at the MEU at the time of data collection were triaged for swallowing difficulties by doctors from the MEU using the self-developed dysphagia triage checklist. Following the completion of the dysphagia triage checklist, patients were immediately screened by the researcher using the South African Dysphagia Screening Tool (SADS) (Ostrofsky & Seedat, 2016). Patients who failed the SADS were referred to the hospitals' speech therapy department for further assessment and management. Patients who were triaged and screened for dysphagia but not admitted to the hospital for further management were not followed up after discharge as per standard hospital protocol.

Inclusion criteria

- All adult patients (regardless of the underlying medical diagnosis) admitted to the MEU were triaged for dysphagia.

Exclusion criteria

- Paediatric patients were not included.
- All triaged adult patients not admitted to the hospital for further management as an inpatient, were considered as part of the attrition sample.

3.5.2.3. Sample size

When conducting research, the sample size plays an essential role in determining the reliability, validity, accuracy and integrity of the study (Chow, Shao & Wang, 2005). It was important that the sample size be large enough to allow for reliable and significant statistical inferences (Cottrell & McKenzie, 2011). Sixteen doctors from the MEU participated in the study, of which

three were students, 10 were medical officers, two were interns and one consultant. The doctors from the MEU were split into groups of between four and six doctors per group. Doctors from the MEU worked according to rotational shifts. There were three shifts daily from Monday to Thursday over the 24-hour period; whereas there were only two12-hour shifts over the weekend (Friday, Saturday, and Sunday). Data collection occurred between 07:00am and 19:00pm from 24 April 2017- 14 June 2017. During the period 24 April 2017 – 14 June 2017, 67 patients of varying diagnoses were triaged using the dysphagia triage checklist.

3.6. Patient procedure upon admission to the MEU

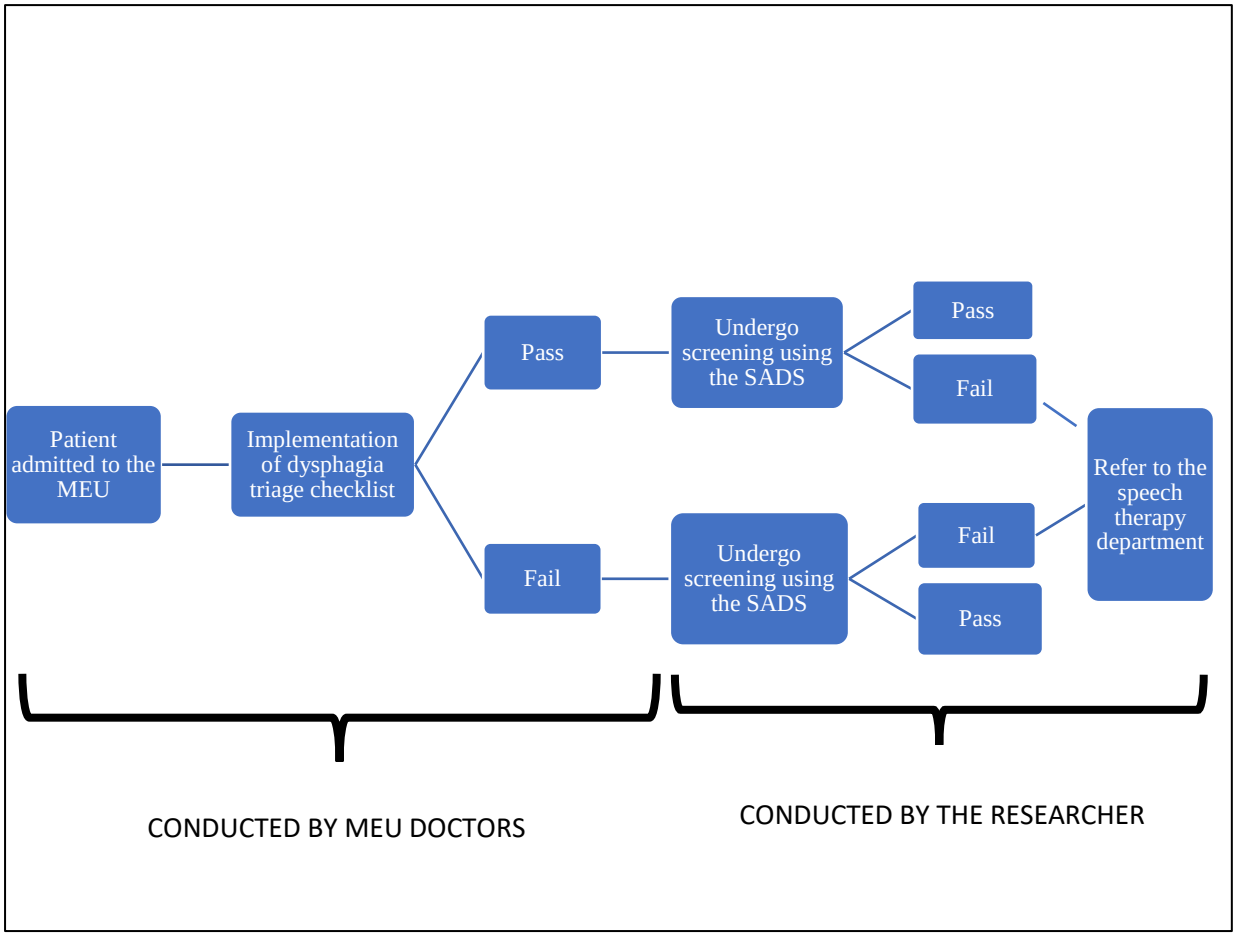


Figure 4: Procedure for a patient admitted to the medical emergency unit

Figure 4 provides an illustration of the procedure that was followed for the patient admitted to the MEU.

1) Patient admitted to the MEU,

2) MEU doctor completes the dysphagia triage checklist on the patient

3) Patient triaged for dysphagia screened by the researcher using the SADS.

4) If the patient failed the SADS → Patients who failed the SADS were referred to the speech therapy department for a diagnostic dysphagia assessment and further management if necessary.

If patient passed SADS → no follow-up by the researcher as per normal hospital protocol.

The research did not seek to standardise the dysphagia assessment protocol used at the hospital. Hence, the protocol for the diagnostic swallow evaluation was not specified. The research was conducted under the assumption that the clinician conducting the dysphagia assessment has graduated and is registered with the HPCSA, hence has met the minimum criteria to practice in dysphagia and so would have knowledge of a dysphagia assessment protocol and its content.

3.7. Research Process

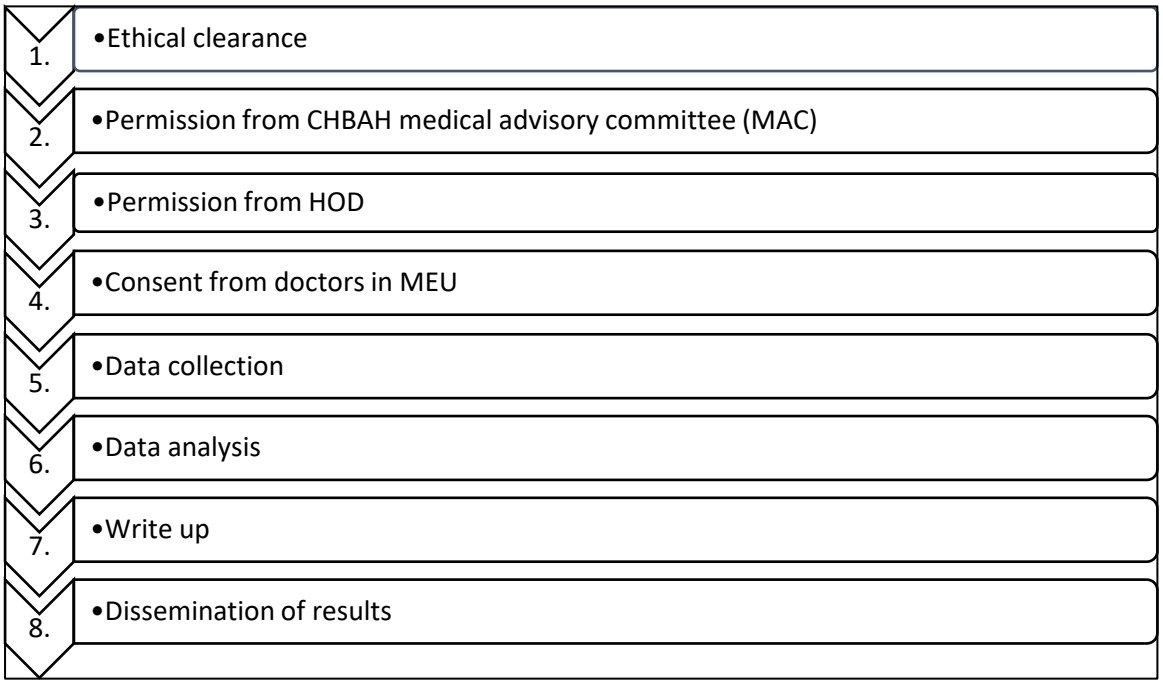


Figure 5: The research process

1. Ethical clearance was obtained from University of the Witwatersrand Human Research and Ethics Committee (Medical) in order to conduct the research. Refer to Appendix A.
2. Following which, an information letter requesting permission to conduct the study at CHBAH was submitted to the Medical Advisory Committee (MAC) (Appendix D). A letter granting the researcher permission to conduct the study was then received (Appendix E).
3. An information letter was provided, and permission was then obtained from the head of department (HOD) of both the MEU (Appendix H and I) and the speech therapy department (Appendix F and G). This allowed the researcher access to the unit and patient records specific to the unit. Furthermore, permission was required by the HOD of the MEU allowed the researcher to approach doctors working in the MEU to participate in the study.
4. Consent from doctors working in the MEU was obtained by distributing information letters and consent forms prior to the commencement of the study. The participants were required

to complete the consent form and answer demographic questions prior to participating in the study (Appendices J and K).

5. Data Collection

a. Ethnography: The data collection process commenced with an ethnographic study which was conducted at the MEU at CHBAH. This observation provided the researcher with information which was vital for the research procedure which followed. Data obtained from the ethnography was recorded on Appendix L.

b. Implementation of the Dysphagia Triage Checklist (Appendix B) in MEU and dysphagia screening as displayed in figure 4.

c. A retrospective Record Review was conducted in the MEU and Speech therapy department (Appendix M): At the end of the data collection process a retrospective record review was conducted by the researcher. This involved reviewing speech therapy in-patient records as well as the records of all patients admitted to the MEU during the period of data collection. The aims of the retrospective record review were:

- To confirm the reliability and validity of the self-developed dysphagia triage checklist by comparing the pass/fail findings of the triage checklist against the bedside swallow assessment results conducted by the speech-language therapists in the hospital,
- To identify the number of patients treated in the MEU during the data collection period, the diagnosis of the patients and the follow up of the patient post treatment in the MEU,
- To identify the total number of patients seen by the speech therapy department in comparison to the number of patients triaged for dysphagia
- The number of patients who passed the dysphagia triaging but were later picked up by the speech therapy department as being at risk for dysphagia

d. Self-developed questionnaire: An electronic self-developed questionnaire (Appendix C) was distributed to all doctors in the MEU who participated in the study. The self-developed questionnaire assisted in evaluating the process of dysphagia triaging as well as the perceptions of the doctors in the MEU

6. Data analysis
7. Write-up and dissemination of the results: following the analysis of the data, findings from the study were written up. The data was then disseminated accordingly, and data is stored in a locked cupboard at the University of the Witwatersrand as per HPCSA regulations. Data will be stored for a minimum of 2 years after publication or 6 years if publication does not occur (HPCSA, 2008).

3.8. Data Collection Tools

3.8.1. Ethnography

Ethnography strives to understand the interactions of individuals with each other and with the culture of the society they operate in (Merriam, 2009). For something to be an ethnography it must provide an account of human social activity. In order to understand the culture of the group, one must spend time with the group being studied or within the environment being studied. Ethnography is a description that emerges from an extensive period of close study and residence in the given social setting (Merriam, 2009). Ethnography calls for the language to be spoken in that setting, first hand participation in some of the activities that take place there and a deep reliance on work with a few individuals from the setting (Merriam, 2009). Immersion in the site as an observer is the primary method of data collection. The aims of the ethnography were: to understand how the MEU worked, the pace of work, space, behaviours and operating processes within the MEU. This information was used to supplement the quantitative data and the qualitative written feedback from the medical professionals who completed the

questionnaire at the end of the study. An observation was conducted at the MEU at CHBAH. This observation allowed for the researcher to become immersed in the culture of the MEU as an active participant. The researcher kept detailed field notes on the observations made (see Appendix L). The observation provided the researcher with information regarding:

- The number of patients admitted in the MEU
- The demographic of patients admitted in the MEU
- The number of medical doctors working in the MEU
- Current practices employed in the MEU
- The availability of equipment
- Presence and responsibilities of assistant staff in the MEU

3.8.2. Dysphagia triage checklist

The dysphagia triage checklist was developed after a systematic review of existing dysphagia screening tools. This allowed the researcher to identify the key areas which needed to be included in the dysphagia triage checklist. The following dysphagia screening tools were reviewed and adapted; The Standardised Swallow Assessment (Perry, 2001; Perry, 2001); Massey Bedside Swallowing Screening (Massey & Jedlicka, 2002), the Yale Swallow Protocol (Leder & Suiter, 2014) and the South African Dysphagia Screening Tool (SADS) (Ostrofsky & Seedat, 2016). The advantages, disadvantages and feasibility for use in the South African context were considered in the development of the checklist. The developed dysphagia triage checklist was divided into four sections and consists of eight test items (Appendix B). The dysphagia triage checklist was administered by the doctors in the MEU between 24 April 2017-14 June 2017.

3.8.2.1. Description of the dysphagia triage checklist

Section A

- Items 1,2 and 3 were aimed at determining the patient's level of alertness as well as their ability to maintain an adequate respiratory status. A decreased level of alertness and state of consciousness may affect the patient's ability to swallow safely (Cicero, 2006). Respiratory compromised patients may experience swallowing difficulty as the effort required to maintain an adequate respiratory rate may make swallowing a challenging and demanding task, thus putting the patient at risk of dysphagia (Cicero, 2006).

Section B

- Item 4 was aimed at determining whether or not the patient can manage their own saliva. Poor saliva management could be indicative of poor head control, inability to close the mouth, abnormal tongue mobility and reduced intra- oral sensation (Cicero, 2006). Additionally, a gurgling vocal quality after swallowing of secretions may indicate pooled material in the pharynx (Cichero, 2006).
- Item 5 assessed the patient's ability to produce voice. The ability to produce voicing provided information regarding laryngeal functioning (Cichero & Murdoch, 2006). If a patient is unable to produce voicing when they receptively understand the instruction, this may be indicative of respiratory problems and laryngeal weakness (Murray, 1999; Cichero & Murdoch, 2006). The true vocal folds may not be fully adducting due to paralysis or trauma or disease leading to less or no protection of the airway and aspiration (Cicero, 2006). Additionally, the presence of wet or 'gurgly' breath sounds and or vocal quality may be indicative of pooled secretions in the pharynx (Johnson & Scott, 2006).

Section C

- *Item 6* determined the patient's receptive language abilities. The ability of the person to communicate may give important information about the person's abilities to follow instructions and an example of purposeful oral motor skills (Murray, 1999).
- *Items 7 and 8* assessed the patients' ability to voluntarily clear their airway and the type of cough a patient presents with, respectively. Measuring a volitional cough is not a predictor of the patients cough reflex in the event of laryngeal penetration or aspiration (Murray, 1999). A volitional cough is not a reflexive cough but the patient's ability to cough voluntarily needs to be determined as there is an increased risk for aspiration in patients who have a weakened voluntary cough (Smith-Hammond et al., 2001). The elicitation of a volitional cough helps the clinician to determine whether the patient is capable of organizing the motor movements necessary to clear their airway and expel any penetrated or aspirated material (Murray, 1999). A productive cough produces phlegm or mucus (sputum) while a nonproductive cough is dry and does not produce sputum (Ainslie, 2009). Cough is abnormal if it is persistent, painful or productive (Ainslie, 2009).

3.8.2.2. Administration of the checklist

For each test item, the administering doctor was required to indicate '√ 'or 'x' result. A fail or 'x' result for any of the test items indicated that the patient was at risk for dysphagia. The checklist was designed to take under two minutes to complete.

3.8.2.3. Pass/fail criteria

The administrator of the test was required to indicate a pass or fail result for each test item. A fail result for any of the test items was indicative of a patient being at risk for dysphagia.

3.8.3. Dysphagia screening

A dysphagia screening was not part of the initial protocol, however due to logistical challenges and challenges around resident speech-language therapist caseloads, referral to the speech therapy department was not possible. Thus, a dysphagia screening was conducted by the researcher immediately after the administration of the dysphagia triage checklist, before the patient was transferred out of the MEU. The screening was necessary as it either confirmed or rejected the findings from the dysphagia triage checklist. The researcher used the South African dysphagia screening tool (SADS) to screen all the triaged patients. Based on the results of the screening, patients who were found to be at risk of dysphagia were referred to the speech therapy department for further assessment and management (figure 4). A screening tool allowed for earlier and appropriate referral to the speech therapist who can appropriately diagnose and treat the patient (Martino & Diamant, 2000; Ostrofsky & Seedat, 2016). The SADS was an appropriate screening tool as it is an effective and efficient dysphagia screening tool which has been found to be reliable and valid for the South African population (Ostrofsky & Seedat, 2016).

3.8.4. Retrospective record review

A retrospective record review is also known as a medical record review. It is a type of data collection in which pre-recorded, patient-centred data are used to answer one or more research questions (Vassar& Holzmann, 2013). A retrospective record review was conducted by the researcher, whereby the files of all adult in-patients seen by the speech-language therapists at CHBAH were reviewed. Furthermore, any diagnostic dysphagia assessment progress notes complied by the speech therapist were compared to the findings of the triage checklist completed by the MEU doctor and the screening completed by the researcher. The record review further explored how many patients were seen at the MEU over the research period (24

April 2017- 14 June 2017) in comparison to how many dysphagia triage checklists were completed and how many patients were assessed and treated by the adult speech therapy team. Doing so provided additional information regarding the feasibility of the use of the dysphagia triage checklist. This record review provided additional information on the significance of the implementation and use of the dysphagia triage checklist. Patient records from both the MEU and the speech therapy department for the period 24 April 2017- 14 June 2017 were reviewed.

3.8.5. Self-developed questionnaire

A questionnaire was circulated via Survey Monkey to all MEU doctors who participated in the study. The questionnaire (Appendix C) took approximately five minutes to complete, as the researcher was aware of the time constraints affecting participating doctors. The questionnaire included the following:

- Demographic information including level of experience
- Perceptions on limitations, and challenges with administration of the checklist
- Perceptions on advantages and benefits of the checklist
- Perceptions on feasibility of the triage checklist within an emergency department.

3.9. Data Analysis

3.9.1. Ethnography

Data from the ethnography was recorded as field notes as seen in Appendix L. The data obtained from the ethnography was analysed using thematic analysis. “Thematic analysis provides an integrated view of the data and identifies main themes in the data” (Henning, Van Rensburg & Smit, 2004, p.42). Thematic analysis is a method for identifying, analysing, and reporting patterns (themes) within data (Boyatzis, 1998). It minimally organises and describes your data set in detail (Boyatzis, 1998). Braun & Clark (2006) provide six steps needed to

complete a thematic analysis. In addition, Braun & Clark recommend moving from one step to the next, however the steps are not linear. The steps for a thematic analysis are as follows (Braun & Clark, 2006):

Step one: Become familiar with the data,

Step two: Generate initial codes,

Step three: Search for themes,

Step four: Review themes,

Step five: Define themes,

Step six: Write-up.

3.9.2. Dysphagia triage checklist

The data obtained from the use of the dysphagia triage checklist and the results of the dysphagia screening were analysed using quantitative measures, specifically correlational coefficients. Cohen's Kappa was used to determine the agreement between the swallowing triage checklist and the diagnostic assessment. The correlational coefficient can range from −1 to +1, where 0 represents poor correlation and 1.0 represents perfect agreement between the variables (Salkind, 2009).

3.9.3. Self-Developed Questionnaire

The self-developed questionnaire was used to gain an idea of the doctors' perceptions around the incorporation of the dysphagia triage in their current procedure. The questionnaire was electronically circulated, via Survey Monkey, to the doctors in the MEU as a mean of evaluating the viability and practicality of using the triage checklist. The questionnaire comprised of a combination of open- and closed-ended questions to ensure that the evaluation

process was robust. Open-ended questions require answers which are non-categorical and non-numerical, such as sentences or documents. These kinds of answers gave the researcher a deeper understanding of the participants' thinking. The open-ended questions were analysed with the use of descriptive qualitative measures (thematic analysis), whereby common themes and patterns were drawn upon. Closed-ended questions are defined as having clear options for the participant to select from. Closed-end questions are used to create data that is easily quantifiable. The closed-ended questions were analysed with the use of descriptive statistics, more specifically measures of frequency.

3.9.4. Retrospective record review

A retrospective record review is sometimes referred to as a medical record review (Matt & Matthew, 2013). It involves reviewing a range of pre-recorded, patient-centred data in order to answer one or more research questions (Matt & Matthew, 2013). The data used in retrospective record reviews exist in many forms: electronic databases, results from diagnostic tests, and notes from health service providers (Matt & Matthew, 2013). The retrospective record review allowed the researcher to compare and determine:

- The number of patients seen in total in the MEU between 24 April 2017- 14 June 2017,
- The medical diagnosis and the management of the patient following treatment in the MEU
- The number of patients who received the administration of the dysphagia triage checklist and subsequently screened by the researcher,
- The number of patients seen by the speech therapy department and how many of which had the dysphagia triage checklist administered on them,
- The time frame between hospital admission and referral to the speech therapy department as well as the time frame between referral and assessment by the speech therapist.

3.10. Ethical Considerations

- Central to the research process, the researcher had ethical responsibilities to uphold initially, during and upon completion of the study (Ostrofsky & Seedat, 2016; Schiavetti & Metz, 2002). The following ethical considerations were central to the data collection and analysis of the study: Necessary approval was obtained from the relevant ethics committee, from the research site and the participants prior to the commencement of the study.

- Throughout the study, the researcher protected the dignity of the patients as well as the privacy and confidentiality of personal information of all participants.

- Participation by the MEU doctors was voluntary and non-participation did not have any consequences on their job.

- All necessary precautions were taken to protect the confidentiality and ensure the anonymity of patients and participants.

- The patient participants were assigned codes at random and identifying information has been excluded from the write up of this study.

- No harm has been caused to participants in this study. The data collection process was not invasive.

3.11. Validity

Validity refers to the degree to which a researcher has measured what she aims to measure (Kumar, 2005). Content validity, face validity, and concurrent validity were included in the data analysis.

Content validity refers to whether the method of measurement measures what it is expected to measure (Schiavetti & Metz, 2002). It requires that the behaviours that are intended on being described (i.e. the signs and symptoms of dysphagia) are comparable to the measure (i.e. the dysphagia triage checklist) in order to determine how effectively such behaviours and characteristics have been represented (Schiavetti & Metz, 2002; Ostrofsky & Seedat, 2016). Content validity was optimised by:

- Reviewing existing screening tools, which were used in the development of the dysphagia triaging checklist
- Ensuring that each test item assessed something specific (Ostrofsky & Seedat, 2016)

Kaplan and Saccuzzo (2012) explain that there are no statistical measures to determine content validity, and such validity is dependent on the judgement of clinical expertise. Content validity was ensured in the development of the dysphagia triage checklist by reviewing previous screening tools, the content validity of such tools, and basing the screening tool items on EBP.

Face validity refers to the suitability of a given instrument as a source of data on the subject under investigation (Schiavetti & Metz, 2002). It is based on the users' judgement. However, it was important to ensure face validity as it provided information on the user's perceptions on the dysphagia triage checklist and had implications for the administration of the checklist. This was done in a way that was accurate and unbiased (Ostrofsky & Seedat, 2016; Schiavetti & Metz, 2002). Face validity was confirmed through the completion of the questionnaire by doctors in the MEU. However, the there was a poor response rate, thus the face validity of the dysphagia triage checklist is interpreted with care. This will be discussed in detail under results.
Concurrent validity is a form of criterion validity. It is based on the notion that it is useful to develop a novel instrument (i.e. a dysphagia triage checklist) that is a shorter version of another pre-existing instrument (i.e. dysphagia screening). The concurrent validity of the newly

developed instrument (i.e. a dysphagia triage checklist) is determined based on how well it correlates with the longer version (Ostrofsky & Seedat, 2016; Schiavetti & Metz, 2002). With the use of Cohen's Kappa, measures of positive agreement and negative agreement provided information regarding the types of agreement that presented between the dysphagia triage checklist and the dysphagia screening.

3.12. Reliability

Reliability refers to the degree of uniformity measured and the extent to which the results remain coherent over time allowing the researcher to provide precise representation of the total population being reviewed (Joppe, 2000). It involves the 'consistency' or 'repeatability' of the measure. The kappa statistic is frequently used to test inter-rater reliability. Measuring inter-rater reliability is important as it shows the extent to which the data collected in the study are a correct representation of the variables measured (McHugh, 2012). Reliability was maintained by using the same dysphagia triage checklist for all patients, inclusion and exclusion criteria remained unchanged; methodology and analysis of data have been standardized. This section is explained in-depth below.

3.13. Trustworthiness

Trustworthiness is defined as the authenticity of the researcher's findings, i.e. all that the researcher has done in designing, carrying out and reporting the research to make the results credible (Nowell, Norris, White & Moules,2017). Trustworthiness is concerned with establishing the following:

Credibility

Credibility is the how confident the researcher is in the truth of the study's findings (Nowell et al., 2017; Stenton, 2004). Lincoln and Guba (1985) as cited by Nowell et al., (2017) argue that ensuring credibility is one of most important factors in establishing trustworthiness. Credibility can be accomplished by prolonged engagement and observation in the field (Nowell et al., 2017; Stenton, 2004). Additionally, it is increased by a thorough description of source data (Nowell et al., 2017; Stenton, 2004). The results of this study have been found to be credible in that the results are linked to the research aims, the methodology remained consistent throughout the study and there is a strong link between the current research and the literature.

Transferability

Transferability is how the researcher demonstrates that the study's findings are applicable to other contexts (Nowell et al., 2017; Stenton, 2004). In this case, 'other contexts' can mean similar situations, similar populations, and similar phenomena (Stenton, 2004). It is done when the researcher gives adequate information about the research instrument, the research context, processes, members, and researcher-participant connections to make it possible for the reader to decide how the findings may transfer (Nowell et al., 2017; Stenton, 2004). Transferability links closely to the validity of the study. It is believed that the results of the study would be replicated regardless of the context, particularly given the current South African health context.

Confirmability

Confirmability is the degree of objectivity in the study's findings (Nowell et al., 2017; Stenton, 2004). In other words, this means that the findings are based on participants' responses and not any potential bias or personal motivations of the researcher (Nowell et al., 2017; Stenton, 2004). This involves making sure that researcher bias does not skew the interpretation of the

findings to fit a certain narrative (Nowell et al., 2017; Stenton, 2004). To establish confirmability, researchers can provide an audit trail, which highlights every step of data analysis that was made in order to provide a rationale for the decisions made (Nowell et al., 2017; Stenton, 2004). An audit trail of the current study can be established by understanding data collection, data analysis, and interpretation of the data as depicted in this research paper.

Dependability

Dependability is the extent that the study could be repeated by other researchers and that the findings would be consistent (Nowell et al., 2017; Stenton, 2004). The procedure by which results are produced must be explicit and repeatable whenever possible. This is achieved by means of accurately monitoring the research design and keeping an audit trail, which is, an in-depth chronology of research activities and processes; influences on the data collection and analysis; emerging themes, classifications, or models (Nowell et al., 2017; Stenton, 2004). Dependability links closely to the reliability of the study. The dependability was established by using the same dysphagia triage checklist for all patients, inclusion and exclusion criteria remained unchanged; methodology and analysis of data were standardized.

Chapter 4: Results

Chapter 4 describes the results obtained from the data collection process. Observations made during the ethnography have been described. The result and outcome of the dysphagia triage checklist have been presented.

4.1.Ethnography

The ethnography allowed the researcher to become immersed in the culture of the ED as an active participant. Field notes were kept, and the following was noted:

On arrival to the ED there were two separate entrances to the TEU and the MEU respectively. The SEU was located behind the MEU. It did not appear to have its own triage station and could not be accessed without passing through the MEU, TEU or the entering via the main hospital.

At the entrance of the MEU and TEU nurses are stationed at an area which has been termed as the 'triage station'. It is here where nurses evaluate the patient's vital signs and triage the patient according to the SATS. The nurses may consult with the designated doctor should the patient not fit exactly into a SATS level (i.e. the patient cannot be classified according to the colour system as described in figure 3). All patients, except for those falling within the red category, need to be examined at the triage station prior to being admitted or referred to a feeder hospital. The colours are associated with the urgency of medical intervention necessary, with red indicating the need for immediate intervention.

The MEU is divided into eight examination rooms, a specialist examination room (EEG, ECG, Portable X-ray), a resuscitation bay comprising of three beds with allocated doctors and nurses depending on the need and a central work station. At the nurses' station there were three boxes which were labelled as follows: New Patient, Nurses Action, Review Box.

Once a patient had received their file, the file was placed into the new patient box in no particular order. This means that patients were not necessarily seen in the order of arrival. Once the patient had been examined, the file would then be placed in the review box should they require further assessments such as blood tests and x-rays, once all additional assessments were completed, the file was then placed into the nurses' action box. The nursing staff were then responsible for completing recommendations and admitting patients to the wards.

Friday, 11 November 2016 9:00am

The newly renovated ED had just reopened. Nurses were packing and arranging equipment and consumables. No patients were being treated at the time. Doctors were working at the central workstation. The researcher was approached by two doctors who made enquiries about the research study.

Saturday, 22 April 2017 2:00pm

The parking lot is empty. There are a few people at the entrance of the ED. The medical MEU felt like a ghost town. Two patients lay in the examination rooms waiting to be transferred to the wards. One doctor sits curled up on a chair playing on her phone. Nurses were chatting amongst themselves with soft music in the background. It is hard to believe that this space could shift from absolute mayhem to being calm and quiet.

4.2. Dysphagia Triage Checklist vs Dysphagia Screening

Table 4: Dysphagia triage results (N= 67)

The total sample size included 67 participants.

Triage Results	Frequency	Percent (%)	Cumulative Frequency	Cumulative Percent (%)
Pass	40	59.7	40	59.7
Fail	27	40.3	67	100

Table 4 shows the number of participants that passed and failed the dysphagia triage checklist. Of all the participants that were triaged for dysphagia using the dysphagia triage checklist, 59.7% (n=40) of the participants passed the triaging, and 40.2% (n=27) failed the dysphagia triage checklist.

Table 5**:** Results from the dysphagia screening (N=67)

Screening Results	Frequency	Percent (%)	Cumulative Frequency	Cumulative Percent (%)
Fail	5	7.46	5	7.46
Pass	62	92. 54	67	100

Table 5 shows the number of participants that presented with dysphagia from the screening assessment, and those participants that did not present with dysphagia. Of all the participants that were assessed using a dysphagia screening assessment (SADS), 7.4% (n=5) of the participants presented with dysphagia and 92.54% (n=62) of the participants did not present with dysphagia. Appendix N is a display of all the patients were referred to the speech therapy

department at the research site. This table further reveals how the diagnosis made in the MEU may at times not be the exact diagnosis and often the patient was found to be diagnosed with something else when admitted.

The percentage of agreement between the dysphagia triage checklist and the dysphagia screening was found to be 59.7%. This means that 59.7% of the patients who were triaged for dysphagia elicited the correct results i.e. correct pass and fails. However due to percentage of agreement being criticised as a poor measure of inter-rater reliability, the correlation between the dysphagia triage checklist and the dysphagia screening was worked out using Cohan's Kappa. Cohen's Kappa was calculated 0.04 which shows poor reliability. The reasons contributing to the poor correlation and subsequent poor reliability will be addressed in the coming sections.

4.3.Feasibility

4.3.1. Retrospective Record Review

A retrospective record review was conducted by the researcher, whereby the files of all adult in-patients seen by the speech-language therapists at CHBAH were reviewed. Furthermore, any diagnostic dysphagia assessment progress notes complied by the speech therapist were compared to the triage checklist completed by the MEU doctor (Appendix M). The record review further explored how many patients were seen at the MEU over the research period (24 April 2017- 14 June 2017) in comparison to how many dysphagia triage checklists were completed and how many patients were assessed and treated by the adult speech therapy team. Doing so provided additional information regarding the feasibility of the use of the dysphagia triage checklist. A statistical analysis provided additional information on the significance of the implementation and use of the dysphagia triage checklist.

4.3.2. Medical emergency unit

A total of 3117 patients were seen at the MEU between 24 April 2017- 14 June 2017.

Figure 6 displays the types of medical conditions treated in the MEU.

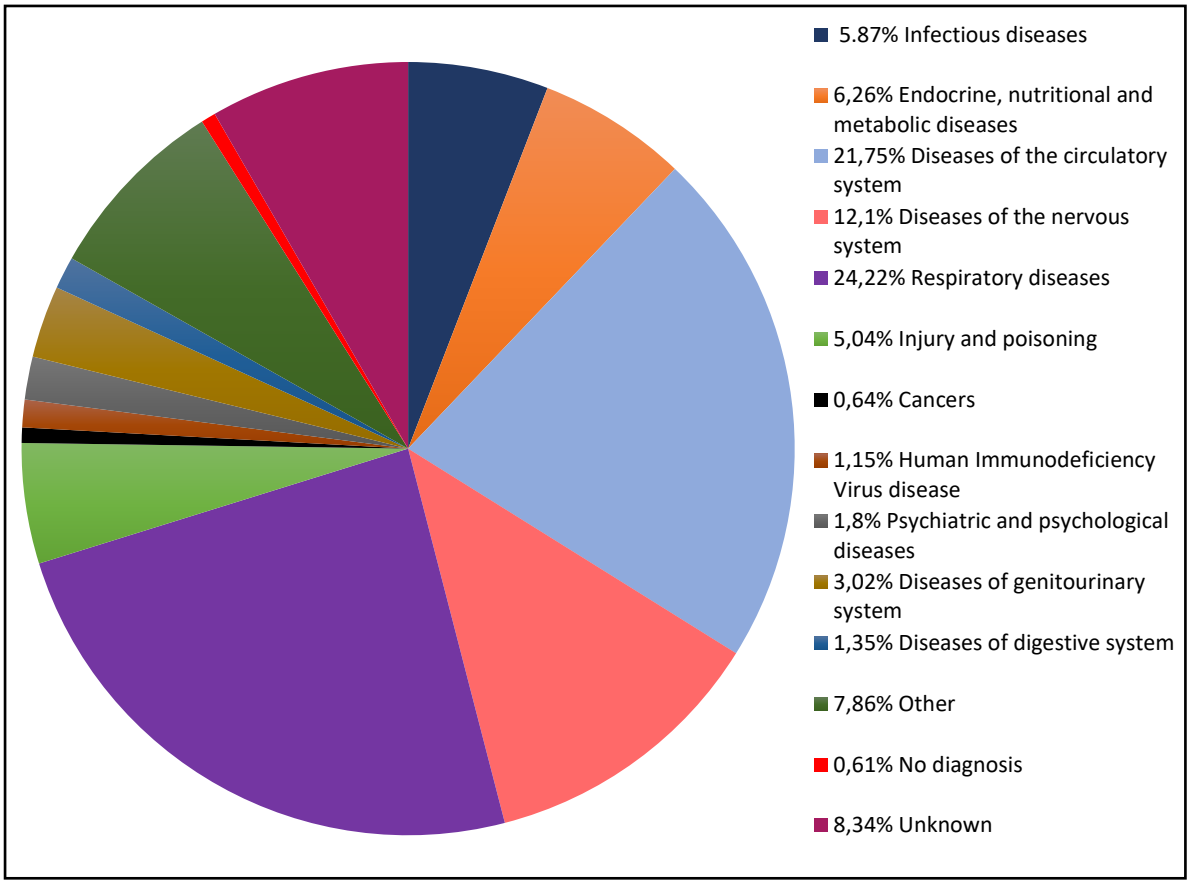


Figure 6: Types of medical diagnoses treated in medical emergency unit

The above figures are based on the initial diagnosis or presenting complaint. It must be noted that patients often presented with multiple diagnosis. For ease of presentation, results were categorised according to the International Classification of Diseases-10 (ICD-10). The following diagnosis were treated:

- Infectious diseases 5.87% (n=183)
- Endocrine, nutritional and metabolic diseases: 6.26% (n=195)
- Diseases of the circulatory system: 21.75% (n=678)
- Diseases of the nervous system: 12.09% (n=377)

- Respiratory diseases: 24.22% (n=755)
- Injury and poisoning: 5.04% (n=157)
- Cancers: 0.64 % (n=20)
- HIV diseases: 1.15% n= (36)
- Psychiatric and psychological diseases: 1.80% (n=56)
- Diseases of the digestive system: 1.35% (n=42)
- Diseases of the genitourinary system: 3.02% (n=94)
- Other: 7.86% (n=245)
- No diagnosis: 0.61% (n=19)
- Unknown/unspecific: 8.34% (n=260)

This information was important to obtain because as discussed in the literature review, dysphagia may be associated with many medical conditions. Table 6 indicates the number of patients who were treated at the MEU and the follow up of these patients during the data collection period 24 April 2017- 14 June 2017.

Table 6: Patient follow-up post-medical emergency unit treatment

Patient follow up post-MEU treatment						
Total number of patients	Refused hospital treatment	Deceased	Discharged	Admitted to CHBAH	Unknown	Transferred to another unit
3117	9	7	270	2779	32	20

As can be seen in table 6; N=3117 patients were treated in the MEU, with n=2779 being admitted to the hospital during the given period. This is a large number in comparison to the number of patients (n=67) triaged for dysphagia and the number of patients (n=160) with a medical diagnosis seen by the speech therapy department during the same period. Considering the high admission rate and the broad range of medical diagnosis associated with dysphagia, it is inevitable that dysphagia patients may not be identified or missed.

4.3.3. Speech therapy department

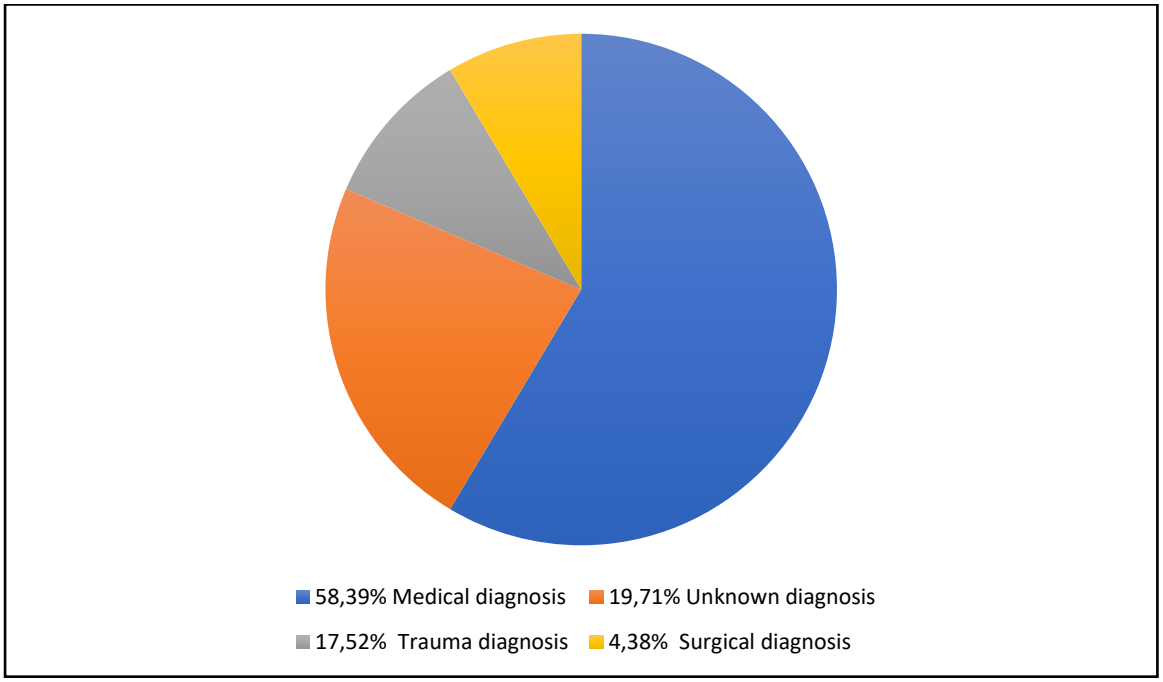


Figure 7: Overview of medical vs surgical vs trauma patients seen within the speech therapy department

A total of 274 speech therapy records were reviewed for the period 24 April 2017- 14 June 2017. Of these, 58.39% (n= 160) had a medical diagnosis, 19.71% (n= 54) had an unknown diagnosis, 17.52% (n=48) had a trauma diagnosis and 4.38% (n=12) had a surgical diagnosis.

Figure 8 provides more specific information about the patients seen with medical diagnoses. This information was obtained so that the number of patients with medical diagnoses seen by the speech therapy department could be compared to the number of patients triaged for dysphagia and the total number of patients treated in the MEU during the data collection period.

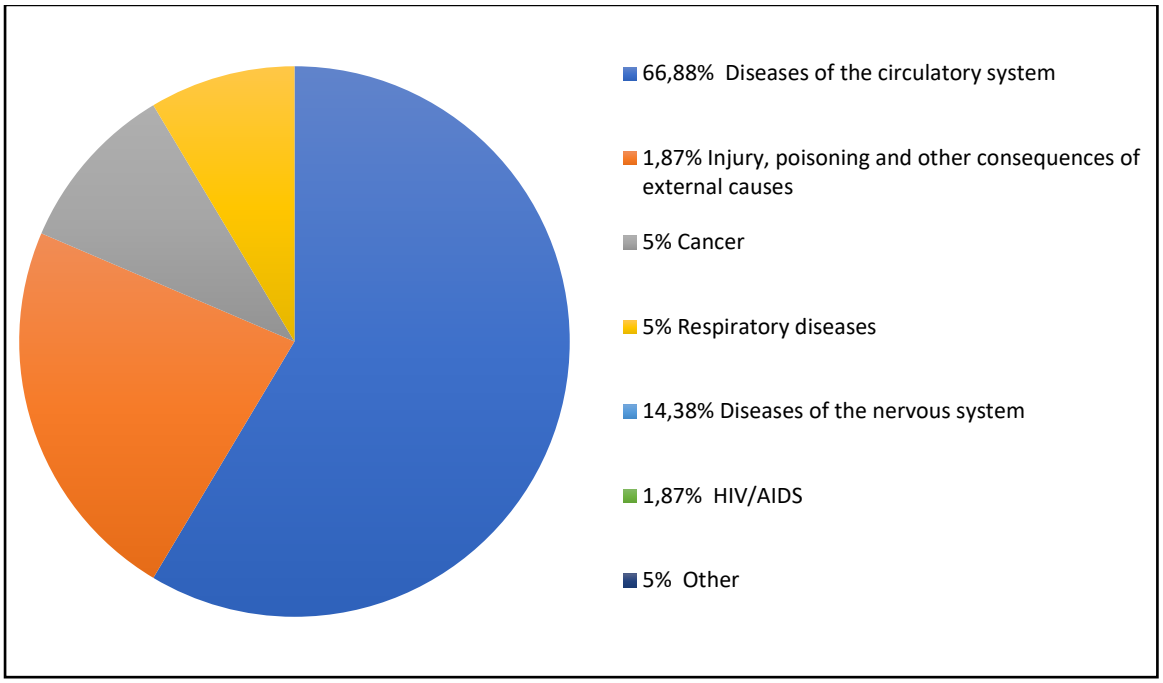


Figure 8: Specific medical diagnoses of patients treated by speech therapy department

For ease of presentation, results were categorised according to the ICD-10, based on their initial complaint/initial diagnoses. The medical diagnoses were as follows:

- 66.88% (n=107) Diseases of the circulatory system
- 1.87%(n=3) Injury, poisoning and other consequences of external causes
- 5%(n=8) Cancer
- 5% (n=8) Respiratory diseases
- 14.38% (n=23) Diseases of the nervous system
- 1.87% (n=3) HIV/AIDS
- 5% (n=8) Other

While the number of patients seen by the speech therapy team during the data collection period is small in comparison to the total number of patients treated in the MEU, almost 60% of the total number of patients had a medical diagnosis of some sort. This is not to say that dysphagia is not associated with trauma or surgical diagnoses, however the focus of the current study was the MEU.

In addition, the researcher noted that five of the patients who were screened by the researcher using the SADS were referred to the speech therapy department for further assessment. The record review revealed the following:

- Inconsistencies in the initial medical diagnosis made in the MEU and the diagnosis on the patient's speech therapy record.
- No patient records for patients whom the speech therapy team deemed as being an inappropriate referral based on verbal handover.

Furthermore, the record review conducted at the speech therapy department revealed that the average time between hospital admission and referral to the speech therapy department was five days; with some patients not being seen on the day of referral due to the timing of the referral or high caseloads.

4.4. Doctors perceptions

4.4.1. Self- developed questionnaire

The self-developed questionnaire was circulated via survey monkey to all the MEU doctors who participated in the research. Demographic information was obtained from the participant consent form. Completion of the questionnaire took approximately three minutes to complete

and could be easily accessed from any internet enabled device. The response rate was poor, with only three responses received from 16 participants.

Out of the 16 participants 63% (n= 10) were medical officers, 6% (n= 1) were consultants, 12% (n=2) were interns and 19% (n=3) were students either at an undergraduate or postgraduate level. All but two of the participants had been working in the MEU for less than five years. None of participants reported having additional training, at a postgraduate level, in the area of dysphagia. The analysis of this questionnaire proved to be a challenge due to the poor response rate. However, the following themes were strongly reflected in the responses:

Ease of use: Two out of the three participants reported that the dysphagia triage checklist was easy to use and felt that it may be a useful measure in the ED. Furthermore, all three of the doctors felt as the dysphagia triage checklist was an "accurate representation of the patient's abilities" with two out of the three mentioning that they would use it as part of their routine patient treatment. and that it had advantages to ensure early referral to the speech therapist for further management.

Challenges: Unfortunately, all three participants felt that the dysphagia triage checklist was additional work and did not fit into natural history taking. These feelings were expressed in the following way by one of the participants "did not fit into history taking". In addition, one of the participants mentioned that "the dysphagia triage checklist did not fit into the already established MEU protocol". In addition, one of the participants raised concerns regarding the availability of the dysphagia triage checklist were raised, as it is common for stationary items and administrative items to run low and not be replaced regularly; "there may be problems if the forms are not printed. One out of the three participants also highlighted challenges with regard to the patients' level of alertness as per the quotation "there could challenge around completing the checklist with sedated or confused patients thus the patients' abilities may be misjudged".

The interpretation of the responses from the questionnaire have been interpreted with caution, given the poor response rate. The poor response rate in itself may have been indicative of the fast-paced, under-resourced and time pressured MEU environment; this will be discussed later.

4.5.Reliability

4.5.1. Cohen's Kappa

Table 7: Calculation of percentage of agreement

		Dysphagia Triage Checklist		
Dysphagia Screening Results (SADS)		**Fail**	**Pass**	**Total**
	Fail	3	3	6
	Pass	24	37	61
	Total	27	40	67

The evaluation of the relationship between the dysphagia triage checklist and the dysphagia screening assessment (SADS) was done using correlation coefficients (Schiavetti & Metz, 2002). Cohen's kappa was used to determine the agreement between the two variables (Wood, 2007). Thus, through the use of Cohen's Kappa, measures of positive agreement and negative agreement provided information regarding the types of agreement that presented between the dysphagia triage checklist and the dysphagia screening assessment (SADS). This is seen in Table 7. The percentage of agreement was calculated by adding the number of correct correlations (between the triage and screening results) and dividing by the number patients triaged and screened in total (i.e. (3+37) / 67=0.5970149254). Thus 59.7% of the patients who were triaged for dysphagia elicited the correct results i.e. correct pass and fails. However, Cohen's Kappa is a preferred measure of inter-rater reliability as it incorporates a calculation

of hypothetical probability of chance agreements, as opposed to percentage agreement (Wood, 2007).

Calculation of Cohen's Kappa

The probability that the participant failed the triage as well as the screening (SADS) was calculated (i.e. P (1): (3+3)/67= 0.8955223881). The probability that the participants had passed the dysphagia triage but failed the screening (SADS) was calculated (i.e. P (2): (37+3)/67=0.5970149254). The calculations of probability were then used to calculate Cohen's Kappa.

*Percentage of Agreement (A): 0.5970149254 (59.7%)

*Expected Agreements (E): 0.5796391178 {(0.4029850746*0.0895522388)

+(0.5970149254* 0.9104477612)}

*Cohen's Kappa: 0.0413354531

The expected percentage of agreement (E) refers to the proportion of agreements between the triage results and the screening results that would be expected by chance between the raters of each evaluation (Wood, 2007). That is, the probability that participants failed the triaging and presented with dysphagia plus the probability that a patient passed the triaging and did not have dysphagia. (E) was calculated to be 0.5796391178. Thus, the percentage of expected agreement was 58%. Probability for chance agreement refers to the probability that the participant presented with dysphagia (i.e. 3/27=0.1111111111) as well as the probability that the participant passed the triage but failed the screening and did present with dysphagia (i.e. 3/40=0.075).

Thus, Cohen's Kappa was calculated using the following formula:

P1(A)-P2(E)}/{1-P(E)= 0.0413354531

The correlation coefficient for kappa can range from -1.0 to +1.0, whereby a kappa of 1.0 is indicative of perfect agreement, and a kappa of 0 shows a poor correlation between the two variables (Wood, 2007). According to Wood (2007), for the purpose of medical studies and diagnosis, a kappa that lies from 0.40 to 0.70 is an appropriate inter-rater reliability. For this study Cohen's Kappa is 0.04 which shows poor reliability. Reasons contributing to the poor reliability have been addressed in the discussion.

4.6.Validity

Validity is the degree to which a researcher has measured what she aims to measure (Kumar, 2005; Rust & Golombok, 1999). Content validity, face validity and concurrent validity were all included in the research analysis.

4.6.1. Content validity

Content validity refers to whether the method of measurement measures what it is expected to measure (Schiavetti & Metz, 2002). That is, whether the signs and symptoms of dysphagia are accurately identified by the use of the dysphagia triage checklist. Despite the dysphagia triage checklist being developed after reviewing already established dysphagia screening tools, it was found not to be specific enough and as a result of this, patients failed for reasons other than dysphagia, such as being on oxygen. Kaplan and Saccuzzo (2012), explain that there are no statistical measures to determine content validity, thus such validity is greatly dependent on clinical reasoning, judgement and expertise. Additionally, there was a huge discrepancy between the number of patient participants and the number of patients treated in the MEU between 24 April 2017 and 14 June 2017. It is possible that a higher sample size of patients may have improved the content validity.

4.6.2. Face validity

Face validity refers to the suitability of a given instrument as a source of data on the subject under investigation (Schiavetti & Metz, 2002). It is based on the users' judgement, but it is important to consider it as it describes the way the user views the dysphagia triage checklist as valid and has implications for administration of the checklist in a way that is accurate and unbiased (Ostrofsky & Seedat, 2016; Schiavetti & Metz, 2002). Face validity should have been confirmed through the completion of the questionnaire by doctors in the MEU, however the response rate was poor. As a result of the poor response rate, face validity cannot be commented on. One must bear in mind the workload and performance demands placed doctors within the South African context. This study reveals that regardless of minimising the time required to complete the online self-developed questionnaire, even these few minutes were too much.

4.6.3. Concurrent validity

Concurrent validity is a form of criterion validity. Concurrent validity was important to consider for this particular study. Concurrent validity is concerned with how well a new shorter version of a measure compares to the existing longer measure (Ostrofsky & Seedat, 2016; Schiavetti and Metz, 2002); that is how well the dysphagia triage checklist correlates with the dysphagia screening. The percentage of agreement (59.7%) refers to the agreement between the results of the dysphagia triage checklist and the dysphagia screening (SADS). However, due to percentage agreement being a criticised measure, Cohen's Kappa was used and provided information regarding the types of agreement that was present between the dysphagia triage checklist and the SADS. Cohen's Kappa was calculated to be 0.04 which shows poor reliability and thus indicates poor concurrent validity. This means that there is poor correlation between the dysphagia triage checklist and the dysphagia screening.

4.7.Sensitivity and Specificity

A measure of sensitivity and specificity of the dysphagia triage checklist was calculated. The measures of sensitivity and specificity are binary classification statistical measures (Haynes, Smith & Hunsley, 2011). Sensitivity measures the proportion of true positives which were correctly identified as such (Haynes, Smith & Hunsley, 2011) (i.e. the percentage of at risk dysphagia patients who were correctly identified as being at risk of having dysphagia). Specificity measures the proportion of true negatives which are correctly identified (i.e. the percentage of patients with normal swallowing who were correctly identified as not being at risk of dysphagia) (Haynes, Smith & Hunsley, 2011).

Table 8: Sensitivity and specificity of the dysphagia triage checklist

		Dysphagia Triage Checklist		
Dysphagia Screening Results (SADS)		**Fail**	**Pass**	**Total**
	Fail	3	3	6
	Pass	24	37	61
	Total	27	40	67

Sensitivity and specificity were calculated, as shown in table 8. The following calculations were done:

Sensitivity = (True Positives)/ (True Positives +False Negative)

= (37)/ (3+37)

=0.92500 (92.5%)

Specificity = True Negatives/ (True Negatives +False Positives)

= (3/ (3+24)

=0.111111 (11.11%)

The dysphagia triage checklist can therefore be defined as being highly sensitive in detecting patients at risk for dysphagia. The specificity of the dysphagia triage checklist is significantly lower than that of the sensitivity, however, it is still adequate in identifying patients as not being at risk for dysphagia, when they do not present with the disorder. The specificity calculation indicates that participants unnecessarily failed the dysphagia triage checklist when in fact, they did not present with the disorder, as based on the results from the screening i.e. false positives were problematic.

4.8.Ethical Considerations

The following section describes the ethical considerations. Central to the research process, the researcher had ethical responsibilities to uphold (Ostrofsky & Seedat, 2016; Schiavetti & Metz, 2002). The following ethical principles guided the research process:

4.8.1. Confidentiality

All information obtained during the data collection remained confidential. The demographic and identifying information of patient participants and doctors in the MEU at the hospital were kept confidential. The patient participants were assigned codes at random and identifying information has been excluded from the write up of this study. Confidentiality will be maintained should any publications arise from this study.

4.8.2. Non-Maleficence

No harm has been caused to participants in this study. The data collection process was not invasive. The completion of the dysphagia triage checklist was done by the doctors in the MEU and was based on observation of the patient. While the dysphagia screening involved food trials; these were administered by the researcher, a speech therapist by profession. The researcher has adequate skills and clinical reasoning in the field of dysphagia, which allowed her to administer the dysphagia screening (SADS). Based on the results of the dysphagia screening, the researcher was able to make feeding recommendations in terms of enteral feeds versus oral feeding and the consistency of oral feeds, before referring the patient to the hospital's speech therapy department for further assessment and management. The researcher personally referred patients who required a diagnostic dysphagia assessment (i.e. those that failed the dysphagia screening) to the speech therapy department.

4.8.3. Beneficence

This study acted in the best interest of the participants and aimed to encourage good over harm. Access to results will be granted to only the researchers and members involved in the research process, should publication not arise. Information will be kept in the archives at the University of Witwatersrand, for a minimum of 2 years after publication or 6 years if publication does not occur (HPCSA, 2008). Thereafter it will be destroyed.

4.8.4. Informed consent and right to withdraw

All participating doctors from the MEU were given information letters and were required to sign consent forms prior to participating in the study. They were given time to consider their decision and were not coerced into participating in the study. Those doctors who agreed to participate signed a consent form. Participants were adequately informed about the nature of

the study and had the right to withdraw at any time in the study process without any negative consequences.

4.8.5. Anonymity

Due to the nature of the study, anonymity could not be guaranteed. However, every effort was made to ensure that the data that was obtained did not reveal any personal information and was kept anonymous through the use of a coding system.

4.8.6. Recording and Management of Data.

All data was transferred onto password secured excel spread sheets which were only accessible to the researcher and supervisor. Using excel allowed for data to be displayed in a clear and logical manner. All hard copies of consent forms and checklists are being kept in a locked cupboard. Data will be stored for a minimum of 2 years after publication or 6 years if publication does not occur (HPCSA, 2008). In order to ensure anonymity and confidentiality a coding system was used to label hospitals, medical professionals and patients.

4.8.7. Trustworthiness

Trustworthiness is defined as the authenticity of the researcher's findings (Nowell et al., 2017). The trustworthiness of this study was achieved according to the credibility, transferability, confirmability and the dependability in the following ways:

Credibility

The credibility of the study was achieved by actively engaging in the environment particularly through the use of the ethnography.

Transferability

While the research aims were achieved, the results of the current study were less than favourable, despite this, the researcher has provided sufficient information for the study to be reproduced or altered should future research arise from this study.

Confirmability and dependability

All data collected has been stored in accordance with the HPCSA regulations. In addition, an audit trail of the data collection has been documented in the above sections; this would allow the study to be reproduced by other researchers.

Chapter 5: Discussion

Chapter 5 provides a discussion of the main research aim as well as the research objectives.

There are many challenges surrounding effective identification of patients who present with dysphagia in developing contexts. These challenges include timing of identification of a swallowing difficulty and the timing of the assessment (Ostrofsky & Seedat, 2016; Seedat, 2014). Early evaluation of dysphagia amongst at risk patients may decrease one's vulnerability to co-morbidities (Hinchey et al., 2005). Additional considerations for the patient accessing a public hospital in South Africa are: financial implications - patients who are breadwinners of the family need to return to work and increased length of hospitalisation impacts this, and an increased likelihood of the patient acquiring other hospital-acquired infections and co-morbidities. Cost efficiency for the hospital and for the patient are important considerations in any resource-constrained and developing context (Ostrofsky & Seedat, 2016). Knowledge and awareness around swallowing and swallowing impairments have improved, however, regardless of its priority status, time, human resources and efficiency of services are compromised for the increasing number of patients that need to be seen who present with dysphagia (Ostrofsky & Seedat, 2016).

The Canadian Best Practice Recommendations for Stroke Care recommend that a swallow screening tool should be simple to use and proven valid and reliable (CSN,2006). Measures of reliability and validity provide the user with an indication of how well a tool may function with a particular patient population (CSN, 2006). Research has shown that early intervention through dysphagia triaging and or screening may positively alter health outcomes. A strong link exists between the early identification of dysphagia and the reduction in the risk of aspiration pneumonia, rate of mortality and reducing PEG insertion rates (CSN, 2006). A study conducted by Hinchey et al. (2005) found that aspiration pneumonia rates in stroke patients

were 2.4% at sites with formal dysphagia screening protocols as opposed to 5.4% at sites with no formal dysphagia screening protocols. This highlights the need for a formal dysphagia early identification protocol, in order to reduce the associated health risks as well as to improve the health outcomes for patients.

The dysphagia triage checklist as opposed to existing dysphagia screening tools required minimal training, could be administered in less than two minutes and did not make use of food trials. In addition, the dysphagia triage checklist was designed to be used on a variety of patient populations and was not limited to a specific diagnosis (for example, stroke). However due to the nature of the study, permission was only granted to conduct the study in the MEU, thus limiting the variety in the patient diagnoses.

While content validity was established by consulting a variety of dysphagia screening tools in the design of the dysphagia triage checklist, the data collection process and the implementation of the dysphagia triage checklist revealed that the checklist items were not specific enough and patients were often found to fail the dysphagia triage checklist for reasons not directly related to dysphagia and/or aspiration. Kaplan and Saccuzzo (2012) explain that there are no statistical measures to determine content validity, and such validity is dependent on the judgement of clinical expertise. Despite this, the dysphagia triage checklist was found to be highly sensitive, have adequate specificity however it was found not to be reliable. In health care research, it is common practice that data be collected by multiple people. Due to the variability, the question of agreement and inter-rater reliability among them is pertinent (McHugh, 2012; Mandysová, Trundová & Ehler, 2016).

This study used two raters (the doctors in the MEU and the researcher) as well as two means of data collection (the dysphagia triage checklist and the South African dysphagia screening

tool). The two raters represented the two ends of the spectrum of clinical knowledge and experience. The raters were required to make somewhat subjective discriminations regarding the patient. This required a level of clinical reasoning and theoretical understanding of dysphagia. Therefore, good agreement between the two raters was difficult to achieve. The reliability of the dysphagia triage checklist was established using Cohen's Kappa which is a correlation coefficient. A Cohen's kappa value between 0.40–0.70 suggests good inter-rater reliability for medical studies (Wood, 2007). Cohen's Kappa was calculated to be 0.04 for this study. This indicates poor inter-rater reliability for the dysphagia triage checklist. The interpretation of Cohen's Kappa is not straightforward as the value can be affected several factors. The magnitude of Cohen's Kappa is largely affected by the prevalence of the assessed attribute (Mandysová, et al., 2016; Shankar & Bangdiwala, 2014). Statistical significance was not attained due to the small sample size thus leading to a lower Kappa value. Thus, the reliability of the study could have been better achieved by including a larger sample size, as well as including varying diagnoses (i.e. medical, trauma, surgical). The concurrent validity of the dysphagia triage checklist was not established as Cohen's Kappa was calculated to be 0.04 which shows poor reliability and thus indicates poor concurrent validity. This means that there is poor correlation between the dysphagia triage checklist and the SADS. The concurrent validity of the study was affected by the participant population.

As mentioned previously, the study was limited to the MEU, however the patients treated in by the surgical and trauma emergency units may have been more appropriate for the study given the risk for dysphagia they might be at. Additionally, the sample size was small, and the validity of the dysphagia triage checklist may have better been established with a larger sample size. Large sample sizes increase the researcher's chance to establish clinical significance and more reliably reflect the population mean (Fritz & MacKinnon, 2007). The intent of sampling is to

choose individuals that are representative of a population so that the results can be generalized to a population (Creswell & Clark, 2007). A sample needs to be large enough for the researcher to draw inferences with some confidence that the sample reflects the characteristics of the entire population (Creswell & Clark, 2007). However, the sample size for the current study was limited due to only being granted permission to conduct the study in the MEU which had implications for the appropriateness of the patient participants which were triaged for dysphagia, as the trauma and surgical cases may have been more appropriate for dysphagia triaging. In addition, the data collection occurred between 07:00am and 19:00pm from 24 April 2017- 14 June 2017. The small sample size had implications and limitations for the poor reliability as acknowledged by Cohen's Kappa.

Face validity is established when an individual (i.e. doctors in the MEU) who is involved in the research concludes that an instrument (i.e. the dysphagia triage checklist) measures what it is said to measure (Bolarinwa,2015). Face validity involved the participating doctors in the MEU looking at the items in the dysphagia triage checklist, during the completion of it and agreeing or disagreeing that the instrument is a valid measure of what it is trying to measure, just on the face of it (Bolarinwa,2015). This is where the responses obtained in the self-developed questionnaire would have been supportive. Face validity was established based on the three responses received from the self-developed questionnaire, however this is not sufficient to make a judgement regarding the face validity of the entire research study. This poor response rate, may be directly related to the high-paced, under-staffed and poorly resourced, working conditions in South African EDs as well as the poor buy-in from doctors regarding having to incorporate an additional measure into an already established patient treatment protocol.

While there are benefits to mixed method research designs there are also weaknesses to this type of design. However, combining two the methods (qualitative and quantitative) in one study can be time consuming and requires experience and skills in both quantitative and qualitative methods. This could mean, that a mixed method project could require a team rather than a single researcher in order to conduct the study meticulously and within the specified time frame (Tariq & Woodman, 2010). This flaw in the mixed method design was noted in the current study as seen by the limited data collection period due to the limited availability of the researcher. However, the benefit of a mixed method design lies in the ability to use a wider range of data tools in order to answer a research question. The integration of different types of data can generate insights into a research question, resulting in enriched understanding of the topic (Tariq & Woodman,2010).

From the above findings, it is clear that the dysphagia triage checklist has its flaws, hence the poor reliability, validity and poor specificity. Despite this being a pilot study, there are benefits to the use of such a tool in that it is meant to aid the clinical decision making of the doctors in the MEU. In addition, the dysphagia triage checklist did not align with the principles of the RPD and in order for this to happen the dysphagia triage checklist would need to be revised in order to be better aligned with the RPD.

The notion of emergency medicine is relatively new to South Africa as it was first registered in 2003 (Wallis et al., 2008). This novel specialisation, coupled with the fast-paced nature, limited staff, high patient to professional ratio and limited resources, and based on the results of the current study confirm that this environment does not allow for the addition of a dysphagia triage checklist to be introduced. Over and above this, the main focus of any ED, whether it be medical, surgical or trauma related, is to provide emergency treatment and stabilise already

compromised patients, rather than to identify associated disorders such as dysphagia. South Africa was included in a World Health Organization (WHO) report demonstrating that most preventable patient deaths were caused by inadequate clinical staff training and supervision, and failure to follow policies or protocols (Reid, Habig, Hsu, & Coombes, 2012; Wallis et al., 2008). So, in an effort to avoid future reports of this nature, it is somewhat understandable why the focus of any ED is to manage patients rather than to specifically identify any associated disorders such as dysphagia.

The 2007 census revealed that 11% of the total South African population is living on below one U.S. dollar a day (Wallis, Garach & Kropman, 2008). These high levels of poverty coupled with the high unemployment rate contribute to the increasing burden of disease. South Africa faces a quadruple burden of disease: violence, HIV/AIDS, infectious diseases and chronic diseases of lifestyle (Wallis et al., 2008); all of which have been associated with dysphagia. The South African public health sector caters to approximately 80% of the total population; majority of which are poor and uneducated (Wallis et al., 2008). “National Health Insurance (NHI) is a health care financing system that is designed to pool funds to actively purchase and provide access to quality, affordable personal healthcare services for all South Africans based on their health needs, irrespective of their socioeconomic status” (DOH, 2017, p13). NHI aims to cover services that are delivered on a people-centred integrated healthcare system (DOH, 2017). This will require a more responsive and accountable health system. The health system would need to consider socio-cultural and socio-economic factors. In addition, this people-centred integrated healthcare system platform aims to improve user satisfaction and in turn should lead to a better quality of life and improved health outcomes across all socioeconomic backgrounds (DOH, 2017). The features of NHI include efficiency and effectiveness. This means that health care resources should be allocated and utilised in a manner that optimizes

value for money by using the resources to maximum advantage, and by maximising the welfare of the community by achieving the right mixture of healthcare programmes for the entire population (DOH, 2017). NHI further aims to ensure that the health system meets acceptable standards of quality and achieves positive health outcomes (DOH, 2017). The concept of dysphagia triage fits into the NHI framework, however given the results of the study, it appears as if the South African health context has a significant way to go before these systems may be effective.

The burden of disease in South Africa is on the rise, negatively affecting the health of the population and more so affecting the poorer communities (DOH, 2017). Non-Communicable Diseases (NCDs) are a key contributor to the mortality and morbidity rate in South Africa. "NCDs are not contagious and result from conditions such as high blood pressure, diabetes mellitus, cardiovascular diseases, obesity, cancer, respiratory diseases such as asthma, and mental health problems" (DOH, 2017, p21). Violence and injury also contribute significantly to the burden of disease. NCDs, and complications associated with violence and injury have a strong link to dysphagia.

"The inequalities and poor quality in the health system are aggravated by a skewed distribution of key health professionals between the public and private sectors" (DOH, 2017, p 23). "The shortage of key health professionals is being experienced in a time of the growth of the population dependent on public healthcare services, and the increasing burden of disease among the population" (DOH, 2017, p23). This has placed extraordinary strain on public sector health services and on the staff, who work in public sector facilities. This, in turn, has contributed to the very poor health outcomes of South Africans, particularly for the lowest income populations and households. Other factors such as job design, remuneration policies,

employment relationships, in hospitable physical work environment, and shortages of equipment have contributed to human resources shortages relates to. These factors have affected the motivation and the ability of the public healthcare sector to recruit and retain the health workforce.

These factors played a role in the validity of the research study, in that participating MEU doctors felt as if the dysphagia triage checklist was an additional measure added to already established protocols which are carried out in our resource constrained context. Additionally, the lack of response from the self-developed questionnaire could also relate to the strain experienced in the MEU, specifically to the patient to doctor ratio.

Chapter 6: Conclusion

Chapter 6 will explore the limitations, contributions and implications of the study followed by the conclusion.

Clinicians are faced with using current research to make decisions for patients and to demonstrate that this research improves clinical outcomes (Jones, Roop, Pohar, Albrecht, & Scott 2015). “Knowledge translation is an active process that facilitates the introduction of new evidence into practice and may identify optimum strategies to close the gap between research and clinical practice” (Jones et al., 2015, p2). “A complex system of interaction and engagement processes exists to influence clinical behaviour and outcomes, which is a broader process than evidence-based practice” (Jones et al., 2015, p2). The dynamics of knowledge flow is dependent on many factors, some of which include the nature of the research and the targeted level of implementation; whether it be implemented at a clinical or organisational level (Jones et al., 2015). Changing clinical behaviour (in this case, the implementation of the dysphagia triage checklist) is dependent not only on individual factors but also factors such as hospital policy, funding and organizational or management influence (Jones, et al. , 2015). This reveals the need for a bottom-up method of implementation as it requires the buy in from both management as well as the people on the ground level. The study revealed that there was less than ideal buy-in from the medical staff at the MEU at both a management and ground level. This is likely to be due to the fact that the implementation of the dysphagia triage checklist had implications for increased workload during the data collection period as well as caused disturbances in the already established protocols in both departments. This indicates that there is likely to be a huge gap between the knowledge and implementation of international research findings. Additionally, the poor response from the self-developed questionnaire could be directly related to the reluctance to include new and additional measures supported by

international literature. Due to the above-mentioned difficulties experienced in EDs, international research is moving toward the notion of models of care and 'the ideal patient journey' (NSW Ministry of Health, 2012). This concept is based on the following:

- Early assessment and streaming to an appropriate model of care
- A team approach to patient care
- Ensuring tasks are performed by the medical practitioner who can most efficiently perform the task (where 'efficiency' balances quality, cost and minimising duplication of work)
- Coordinated patient care
- Strong monitoring and evaluation measures
- Adherence to the principles of models of care (NSW Ministry of Health, 2012).

Looking at these principals of the ideal patient journey, early identification of dysphagia in at-risk patients would fit well into this model.

The dysphagia triage checklist was identified as having poor reliability and validity as described in previous sections. While in theory and based on the literature, dysphagia triaging is of value to the acute health system, it is unlikely, at this stage, that South African EDs would be able to cope with the additional demand of the dysphagia triage checklist. However, having been involved in the research process it makes sense as to why this has not been done, particularly in the South African context. The focus of any ED is to stabilise medically unstable patients, with the risk of dysphagia and aspiration unlikely to be a priority at that time. However, it is still of utmost importance for dysphagia to be identified at the earliest possible point within the patient's hospital admission. The domino effect that dysphagia has is significant and has implications for patient prognosis, loss of income of the patients due to prolonged and continued hospital admissions, household expenses may increase, and other

members of the family may miss school or work as a result of assisting their ill family member, social isolation and poor quality of life. There are also hospital associated costs such as incorrect diet allocations and medication administration to consider.

Screening for dysphagia by other members of the multi-disciplinary team, such as nurses or doctors, may be the solution to this dilemma, which is common practice in international literature, particularly due to the limited availability of speech-language therapists.

6.1. Limitations

As mentioned previously, the ED is subdivided into three separate units, namely the surgical, trauma and medical emergency units. Permission was only granted to conduct this research study in the medical emergency unit. This was due to the high patient case load in the trauma and surgical emergency units and thus the inability of doctors to incorporate an additional measure in their already pressurised environment. This had implications for the appropriateness of the patient participants which were triaged for dysphagia, as the trauma and surgical cases may have been more appropriate for dysphagia triaging. Additionally, the small sample size had implications and limitations for the poor reliability as acknowledged by Cohen's Kappa.

The fast-paced nature and quick turnaround time at the MEU appeared to make it challenging for the treating doctors to pinpoint a specific diagnosis with the patients and sometimes medical signs and symptoms were missed, despite the patient being medically stable. This was noted when a patient was diagnosed with having a cerebrovascular accident, but during the retrospective record review of speech therapy records it was revealed that this patient in fact was having a psychosis. This reveals that any doctors' priority is to stabilise and manage the patient medically, rather than to diagnose and manage consequences of illness, such as dysphagia. It must however be noted that this is likely to be a result of a difficult and pressurised

working environment rather than having direct implications for the skills of the doctors. Furthermore, there was less than ideal buy-in both from the medical staff at the MEU and the speech therapy department at the research site. This is likely to be due to the fact that it had implications for increased workload during the data collection period as well as caused disturbances in the already established protocols in both departments. While this required adjustments short-term for the purpose of data collection and research, it may have allowed for improved dysphagia practices in the long-term given the theoretical benefits of dysphagia triaging.

Additionally, there were methodological limitations which contributed to this study. A dysphagia screening was not part of the initial protocol, however due to logistical challenges and challenges around resident speech therapist caseloads, referral to the speech therapy department was not possible. Thus, it was necessary for the researcher to conduct a dysphagia screening prior to the patient being transferred out of the MEU. Additionally, the research was limited to the MEU and thus did not include patients with trauma and surgical diagnosis. Finally, due to the researcher having to be fully involved in the data collection, data collection was limited to a specific time frame which reduced the number of patient participants. Research has shown that when small sample sizes are too small informational redundancy and theoretical saturation may be compromised (Sandelowski, 1995).

6.2.Contributions

In theory a dysphagia triage protocol has many benefits, and based on this premise, the research topic was formulated. However, having implemented and piloted the process it is clear that a significant gap between knowledge and implementation of triage still remains i.e. a knowledge to action gap, and it is clear that under the current circumstances, EDs in SA are not yet ready for a triage process in dysphagia.

The results of this study, together with the literature, reveal that there is an ongoing need to continue with early identification of dysphagia, however alternative options such as dysphagia screening may be more beneficial. This avenue would require further research in terms of feasibility, resources, staffing and professional boundaries. A first step toward early identification of dysphagia may be to pilot an MDT dysphagia screening protocol at a provincial or even at a national level. Depending on the outcome of this pilot, i.e., the facilitators and challenges thereof, dysphagia triage may be the next step. However, based on the outcome of the current study, it is clear that EDs are overburdened, the caseloads are complex, staff and resources are not sufficient, hence an additional measure (the dysphagia triage checklist), regardless of the value, cannot be accommodated at EDs at public hospitals currently (Rosedale et al., 2011).

The study also confirmed that for implementation of an alternate or new protocol, a bottom-up model of implementation is necessary as opposed to top-down i.e. the staff on the ground must be involved in the decision-making process, and not just management. There is also a greater need for buy-in from management. However, the study demonstrates that regardless of management being open to modifying procedures and protocols, if the staff on the ground do not implement revised protocols effectively and accordingly, it simply will not work.

6.3.Implications

This study has implications for future research. Early identification of dysphagia has implications for patient management and outcome. Due to the poor prognostic outcome of patients with dysphagia, the need to identify reasonable means of early identification is imperative. However, alternative options such as dysphagia screening may be more beneficial. This avenue would require further research in terms of feasibility, resources, staffing and professional boundaries. A dysphagia screening pilot study, should include members of the MDT and would need to be done on a larger scale, including multiple medical settings as well as patients with a variety of diagnoses. However, based on the outcome of the current study, it is clear that EDs, may not be the optimum environment for such a project.

As patient centred health care facilities pride themselves on working as part of an MDT team training and education with regard to dysphagia is key. A standardised dysphagia specific training programme should be run across hospitals at a national or even provincial level. This will ensure standardisation of protocols to be implemented. Regular training programmes should be run in order to educate doctors, nurses and allied team members on the signs, symptoms and needs for early identification of dysphagia.

Policies and procedures should be developed by the MDT teams as well as with relevant members of management which stipulate the necessary protocols for dysphagia identification. Policy-makers play an important role in influencing whether and to what degree research findings influence health services (Haines, Kuruvilla, & Borchert, 2004). These policies and procedures should include dysphagia screening protocols, as screening is not limited to the scope of practice of the speech therapist. while there may be extensive research on the

effectiveness of early dysphagia identification, the research does not account for the cost-effectiveness, implementation, cultural appropriateness and effects on health inequalities (Haines et al., 2004), specifically within the South African context.

The literature has highlighted the need and the benefits of early dysphagia identification. It is well known that early identification of dysphagia is directly related to patient prognosis. However, the study clearly identifies that the ED is not conducive for this purpose, especially in South Africa. As mentioned in previous sections, dysphagia screening is not limited to the scope of practice of the speech therapist. Based on this premise, the notion of an MDT dysphagia screening protocol should be further explored. The South African Dysphagia Screening Tool has been normed in the south African context and may be an appropriate dysphagia screening measure. The SADS has piloted and has been found to be both reliable and valid, however has only been used during research. it is therefore recommended that the use of this tool, be implemented on a larger scale, i.e. at a national or provincial level. This links to the focus of the NHI and the need for screening practices to be incorporated into hospital protocols t this appears to be the direction in which healthcare in South Africa is headed.

6.4.Conclusion

In conclusion, the results of this study and the literature reveal that there is a definite need for early identification of patients at risk of dysphagia. Findings from this study have revealed that there were significant time delays between the patient being admitted and being referred to the speech therapy department which in turn has implications in terms of hospital costs, incorrect diet and medication allocations and the patient prognosis. Moreover, emergency medical environment is not conducive and does not allow for an additional triaging measure, not in

South Africa at least, regardless of the theoretical importance of early detection and intervention benefits for dysphagia. While medical settings pride themselves as multidisciplinary there appears to be a gap when it comes to the early identification of dysphagia.

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Appendix A

For researcher only

CODE: _____

Appendix B

SPEECH PATHOLOGY AND AUDIOLOGY
SCHOOL OF HUMAN & COMMUNITY DEVELOPMENT
FACULTY OF HUMANITIES
UNIVERSITY OF THE WITWATERSRAND
Private Bag 3, WITS, 2050
Tel: (011) 717 4577 Fax: (011) 717 4572

Dysphagia Triage Checklist

PLEASE COMPLETE:

Patient Hospital Number: _____ Patient Name: _____

Name of Hospital: _____ Administered by: _____

Date of Assessment: _____ Date of Screening: _____

Medical Diagnosis: _____

INSTRUCTIONS:

- Familiarise yourself with the checklist prior to administering it
- The checklist should take you no longer than 2 minutes to complete
- The checklist should be administered as part of the triage process in the Emergency Department
- For each test item, you will be required to an indicate 'V 'or 'x' result.
- The entire checklist must be completed and if there are any 'x' a speech therapy referral is indicated
- If you are unsure refer to a Speech Therapist
- Put the original copy in the sealed box for the researcher and the duplicate in the patients file

		indicate '√ 'or 'x'
	SECTION A	
1.	Is the patient awake and alert?	
2.	Is the patient responsive?	
3.	Is the patient able to breathe freely? (i.e. no difficulty breathing or maintaining SATS)	
	SECTION B	
4.	Can the patient maintain control of their saliva?	
5.	Does the patient have a wet or hoarse sounding voice?	
	SECTION C	
6.	Can the patient understand your instructions?	
7.	Can the patient cough when asked to?	
8.	Is the patient's cough productive?	

Checklist adapted from: The Standardised Swallow Assessment; Massey Bedside Swallowing Screening, Yale Swallow Protocol; the South African dysphagia screening tool (SADS)

For researcher only

CODE: _____

Appendix C

SPEECH PATHOLOGY AND AUDIOLOGY

SCHOOL OF HUMAN & COMMUNITY DEVELOPMENT
FACULTY OF HUMANITIES
UNIVERSITY OF THE WITWATERSRAND
Private Bag 3, WITS, 2050
Tel: (011) 717 4577 Fax: (011) 717 4572

Doctor Evaluation Questionnaire

Instruction: Please answer all the questions by ticking a box for each answer

1. What is your rank in the Emergency Department?

☐ Student (Which year are you in? _____)

☐ Intern ☐ Community Service ☐ Medical Officer ☐ Registrar

2. How long have you been working in the Emergency Department?

☐ Less than 5 years ☐ 5-10 years ☐ 10-15 years

3. Have you had any additional training with regard to dysphagia?

☐ Yes ☐ No

If yes, please explain

_____
_____
_____
_____

4. Did you find the triage checklist useful?

☐ Yes ☐ No

Please explain

_____
_____
_____
_____

5. Is the triage checklist an accurate representation of the patient's ability?

☐ Yes ☐ No

Please explain

_____
_____

_____
_____

6. Do you find the triage tool easy to use?

☐ Yes ☐ No

Please explain

_____
_____
_____
_____

7. Would you use the triage checklist as part of routine treatment?

☐ Yes ☐ No

Please explain

_____
_____
_____
_____

8. Did you find that the triage checklist lessened or increased your case load? Please explain

_____
_____
_____
_____

9. What did you see as disadvantages of the dysphagia triage checklist?

_____
_____
_____
_____

10. Do you have any suggests or comments?

_____
_____
_____

Thank you for taking the time to participate in the research and completing this questionnaire. Please return the completed questionnaire to the researcher as soon as possible.

Appendix D

SPEECH PATHOLOGY AND AUDIOLOGY

SCHOOL OF HUMAN & COMMUNITY DEVELOPMENT
FACULTY OF HUMANITIES
UNIVERSITY OF THE WITWATERSRAND
Private Bag 3, WITS, 2050
Tel: (011) 717 4577 Fax: (011) 717 4572

Date:

To: The Chief Executive Officer/ Medical Advisory Committee

(name of hospital)

RE: Information Letter and Request for Consent to Conduct Research at XXX (name of hospital)

My name is Kelly-Ann Kater. I am a speech therapist and I have an interest in dysphagia within the adult population. I am currently registered at The University of the Witwatersrand for a Masters in Speech Therapy. The title of my research is: *"Triaging for dysphagia in Public emergency departments: A Pilot Study".*

Early detection of dysphagia is vital as it improves health outcomes in that it has been shown to reduce the length of hospital stay, hospital cost, the risk of pneumonia and associated mortality. By introducing a dysphagia triage checklist in emergency departments, will ensure that dysphagia be identified at the earliest point of the hospital admission and that an appropriate referral be made to a speech therapist. Triaging of patients is vital to ensure that at-risk patients are appropriately identified and referred for further assessment and management. A valid dysphagia triage tool will reduce the risk of a patient commencing oral intake inappropriately or unsafely. There are also hospital catering costs associated with incorrect diet al. locations and food wastage issues. Poor nutritional intake may intensify costs related to recovery and length of stay. Research has also shown that swallow triaging provides timely multidisciplinary care to the patient and reduces patient length of stay and complications.

The study will take place at your hospital's emergency department and will require all patients admitted to the emergency department to be triaged for dysphagia by the treating doctor. All

triaged patients will be referred to your institutions speech therapist for a diagnostic dysphagia assessment and a paper trial record review will be conducted by the researcher of the patient's assessment notes. The completed checklists will be collected by the researcher on a weekly basis from your emergency department so as not to inconvenience the participants. Additionally, an ethnographic study will be conducted my myself in each emergency department in order to determine the average number of patients admitted in the emergency department; the demographic of patients admitted in the emergency department; the number of medical doctors working in the emergency department; the current practices employed in the emergency department; the availability of equipment and the presence and responsibilities of assistant staff in the emergency department.

I would like to invite doctors employed in your emergency departments, as well as speech-language therapists employed at your institution to take part in this research study. This study will be a pilot study to determine the feasibility of swallow triaging in the emergency department. The identity of the hospital and individual participants will be kept confidential throughout the research process.

Your hospital has been chosen as it services a large adult population which is financially, culturally, socially and linguistically representative of the average South African population, the hospital promotes and advocates research and supports the concept of evidence-based practice, the hospital promotes better health care for all and multidisciplinary teamwork is central to holistic patient management.

Benefits of the proposed study for your hospital:

1. Being involved in Evidence- Based research in adult dysphagia
2. Reduction in the risk of aspiration pneumonia and associated mortality and in turn the length of hospital stay
3. Reduction in hospital costs due to shorter length of stay, less referrals for objective dysphagia assessments, reduction of inappropriate or unsafe oral intake (food and medication), reduction of incorrect diet al. locations and food wastage issues associated with dysphagia
4. Increased and timely referrals to the speech therapist for further assessment and management of patients at risk of dysphagia
5. Improved patient quality of life and due to appropriate feeding recommendations at the earliest point

Potential disadvantages:

1. Initially more paperwork for the doctors in the emergency department, which will decrease with time, experience and familiarity
2. Initially an increase in the speech-language therapists case load which will decrease with time and experience and familiarity of the emergency department doctors of the dysphagia triage checklist

Additional details regarding the study and relevant consent and information sheets can be obtained from my proposal (attached). Ethical clearance will be obtained from University of the Witwatersrand Human Research and Ethics Committee (Medical) prior to commencement of the study. Furthermore, ethical aspects such as confidentiality, beneficence and non-maleficence, informed consent and anonymity will be strictly adhered to for all involved in the study. The identity of the hospital and individual participants will be kept confidential throughout the research process. You are under no obligation to take part in the study and you have the right to withdraw at any point during the process of the study.

I hope that this request will be viewed as favourably and should you have any queries, please do not hesitate to contact me or my research supervisor on the listed contact details. For any ethical queries please contact the Human Research Ethics Committee (Medical): (011) 717-1234.

Kind Regards,

Kelly-Ann Kater
Speech Therapist and Audiologist
Mobile: 082-549-2474
Email: kellyannkater@gmail.com

Dr. Jaishika Seedat
Research Supervisor
*Email:*jaishika.seedat@wits.ac.za

Appendix E

Appendix F

SPEECH PATHOLOGY AND AUDIOLOGY

SCHOOL OF HUMAN & COMMUNITY DEVELOPMENT
FACULTY OF HUMANITIES
UNIVERSITY OF THE WITWATERSRAND
Private Bag 3, WITS, 2050
Tel: (011) 717 4577 Fax: (011) 717 4572

Date:

To: The Head of Department of Speech Therapy

(name of hospital)

RE: Information Letter and Request for Consent to Conduct Research at XXX (name of hospital)

My name is Kelly-Ann Kater. I am a speech therapist and I have an interest in dysphagia within the adult population. I am currently registered at The University of the Witwatersrand for a Masters in Speech Therapy. The title of my research is: *"Triaging for dysphagia in Public emergency departments: A Pilot Study".*

Early detection of dysphagia is vital as it improves health outcomes in that it has been shown to reduce the length of hospital stay, hospital cost, the risk of pneumonia and associated mortality. By introducing a dysphagia triage checklist in emergency departments, will ensure that dysphagia be identified at the earliest point of the hospital admission and that an appropriate referral be made to a speech therapist. Triaging of patients is vital to ensure that at-risk patients are appropriately identified and referred for further assessment and management. A valid dysphagia triage tool will reduce the risk of a patient commencing oral intake inappropriately or unsafely. There are also hospital catering costs associated with incorrect diet al. locations and food wastage issues. Poor nutritional intake may intensify costs related to recovery and length of stay. Research has also shown that swallow triaging provides timely multidisciplinary care to the patient and reduces patient length of stay and complications.

The study will take place at your hospital's emergency department and will require all patients admitted to the emergency department to be triaged for dysphagia by the treating doctor. All

triaged patients will be referred to your institutions speech therapist for a diagnostic dysphagia assessment and a paper trial record review will be conducted by the researcher of the patient's assessment notes at a time that suits both the researcher and the participating speech-language therapists.

Following the completion of the study, participating speech-language therapists will be required to complete questionnaire to evaluate the process. The questionnaire should take 5-8 minutes to complete and can be done at a convenient time for you but within a week of having been involved in the data collection process. The questionnaire will be distributed and returned electronically and an email address is required for all participants.

The pace and complexities that exist within public hospitals in South Africa are acknowledged, hence the dysphagia triage checklist being proposed is aimed at being easy to complete and quick. Utilisation of the checklist will allow for immediate patient identification and timely referral for ongoing care and reduce the risk of a patient commencing oral intake inappropriately or unsafely. The information gained from this study would be invaluable. The data collection will occur over a minimum period of one month. During this month you may experience an increase in the number of referrals to your department. However, the use of the dysphagia triage checklist and the data collected may lead to more timely referrals in the long run.

Your hospital has been chosen as it services a large adult population which is financially, culturally, socially and linguistically representative of the average South African population, the hospital promotes and advocates research and supports the concept of evidence based practice, the hospital promotes better health care for all and multidisciplinary teamwork is central to holistic patient management.

Benefits of the proposed study for your hospital:

1. Being involved in Evidence- Based research in adult dysphagia
2. Reduction in the risk of aspiration pneumonia and associated mortality and in turn the length of hospital stay
3. Reduction in hospital costs due to shorter length of stay, less referrals for objective dysphagia assessments, reduction of inappropriate or unsafe oral intake (food and medication), reduction of incorrect diet al. locations and food wastage issues associated with dysphagia

4. Increased and timely referrals to the speech therapist for further assessment and management of patients at risk of dysphagia
5. Improved patient quality of life and due to appropriate feeding recommendations at the earliest point

Potential disadvantages:

1. Initially more paperwork for the doctors in the emergency department, which will decrease with time, experience and familiarity
2. Initially an increase in the speech-language therapists case load which will decrease with time and experience and familiarity of the emergency department doctors of the dysphagia triage checklist

Ethical aspects such as confidentiality, beneficence and non-maleficence, informed consent and anonymity will be strictly adhered to for all involved in the study. The identity of the hospital and individual participants will be kept confidential throughout the research process. You are under no obligation to take part in the study and you have the right to withdraw at any point during the process of the study.

I hope that this request will be viewed as favourably and should you have any queries, please do not hesitate to contact me or my research supervisor on the listed contact details. For any ethical queries please contact the Human Research Ethics Committee (Medical): (011) 717-1234.

Kind Regards,

Kelly-Ann Kater
Speech Therapist and Audiologist
Mobile: 082-549-2474
Email: kellyannkater@gmail.com

Dr. Jaishika Seedat
Research Supervisor
*Email:*jaishika.seedat@wits.ac.za

Appendix G

Appendix H

SPEECH PATHOLOGY AND AUDIOLOGY
SCHOOL OF HUMAN & COMMUNITY DEVELOPMENT
FACULTY OF HUMANITIES
UNIVERSITY OF THE WITWATERSRAND
Private Bag 3, WITS, 2050
Tel: (011) 717 4577 Fax: (011) 717 4572

Date:

To: Head of Department Emergency Department

(name of hospital)

RE: Information Letter and Request for Consent to Conduct Research at XXX (name of hospital)

My name is Kelly-Ann Kater. I am a speech therapist and I have an interest in dysphagia within the adult population. I am currently registered at The University of the Witwatersrand for a Masters in Speech Therapy. The title of my research is: *"Triaging for dysphagia in Public emergency departments: A Pilot Study".*

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The study will take place at your hospital's emergency department and will require all patients admitted to the emergency department to be triaged for dysphagia by the treating doctor. All

triaged patients will be referred to your institutions speech therapist for a diagnostic dysphagia assessment and a paper trial record review will be conducted by the researcher of the patient's assessment notes. The completed checklists will be collected by the researcher on a weekly basis from your emergency department so as not to inconvenience the participants. Additionally, an ethnographic study will be conducted my myself in each emergency department in order to determine the average number of patients admitted in the emergency department; the demographic of patients admitted in the emergency department; the number of medical doctors working in the emergency department; the current practices employed in the emergency department; the availability of equipment and the presence and responsibilities of assistant staff in the emergency department.

I would like to invite doctors employed in your emergency departments, as well as speech-language therapists employed at your institution to take part in this research study. This study will be a pilot study to determine the feasibility of swallow triaging in the emergency department. The identity of the hospital and individual participants will be kept confidential throughout the research process.

Your hospital has been chosen as it services a large adult population which is financially, culturally, socially and linguistically representative of the average South African population, the hospital promotes and advocates research and supports the concept of evidence based practice, the hospital promotes better health care for all and multidisciplinary teamwork is central to holistic patient management.

Benefits of the proposed study for your hospital:

1. Being involved in Evidence- Based research in adult dysphagia
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5. Improved patient quality of life and due to appropriate feeding recommendations at the earliest point

Potential disadvantages:

1. Initially more paperwork for the doctors in the emergency department, which will decrease with time, experience and familiarity
2. Initially an increase in the speech-language therapists case load which will decrease with time and experience and familiarity of the emergency department doctors of the dysphagia triage checklist

Additional details regarding the study and relevant consent and information sheets can be obtained from my proposal (attached). Ethical clearance will be obtained from University of the Witwatersrand Human Research and Ethics Committee (Medical) prior to commencement of the study. Furthermore, ethical aspects such as confidentiality, beneficence and non-maleficence, informed consent and anonymity will be strictly adhered to for all involved in the study. The identity of the hospital and individual participants will be kept confidential throughout the research process. You are under no obligation to take part in the study and you have the right to withdraw at any point during the process of the study.

I hope that this request will be viewed as favourably and should you have any queries, please do not hesitate to contact me or my research supervisor on the listed contact details. For any ethical queries please contact the Human Research Ethics Committee (Medical): (011) 717-1234.

Kind Regards,

Kelly-Ann Kater
Speech Therapist and Audiologist
Mobile: 082-549-2474
Email: kellyannkater@gmail.com

Dr. Jaishika Seedat
Research Supervisor
*Email:*jaishika.seedat@wits.ac.za

Appendix I

Appendix J

SPEECH PATHOLOGY AND AUDIOLOGY

SCHOOL OF HUMAN & COMMUNITY DEVELOPMENT
FACULTY OF HUMANITIES
UNIVERSITY OF THE WITWATERSRAND
Private Bag 3, WITS, 2050
Tel: (011) 717 4577 Fax: (011) 717 4572

Date:

To: Emergency Department Doctor

(name of hospital)

RE: Information Letter and Request for Consent to Participate in Research at XXX (name of hospital)

My name is Kelly-Ann Kater. I am a speech therapist and I have an interest in dysphagia within the adult population. I am currently registered at The University of the Witwatersrand for a Masters in Speech Therapy. The title of my research is: *"Triaging for dysphagia in Public emergency departments: A Pilot Study".*

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The study will take place at your hospital's emergency department and will require all patients admitted to the emergency department to be triaged for dysphagia by the treating doctor. All

triaged patients will need to be referred to the speech therapist for a diagnostic dysphagia assessment following hospital referral protocol.

Following the completion of the study, participating emergency department doctors will be required to complete questionnaire to evaluate the process. The questionnaire should take 5-8 minutes to complete and can be done at a convenient time for you but within a week of having been involved in the data collection process. The questionnaire will be distributed and returned electronically and an email address is required for all participants.

The pace and complexities that exist within public hospitals in South Africa are acknowledged, hence the dysphagia triage checklist being proposed is aimed at being easy and quick to complete. Utilisation of the checklist will allow for immediate patient identification and timely referral for ongoing care and reduce the risk of a patient commencing oral intake inappropriately or unsafely. The information gained from this study would be invaluable. The data collection will occur over a minimum period of one month.

Your hospital has been chosen as it services a large adult population which is financially, culturally, socially and linguistically representative of the average South African population, the hospital promotes and advocates research and supports the concept of evidence based practice, the hospital promotes better health care for all and multidisciplinary teamwork is central to holistic patient management.

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4. Increased and timely referrals to the speech therapist for further assessment and management of patients at risk of dysphagia
5. Improved patient quality of life and due to appropriate feeding recommendations at the earliest point

Potential disadvantages:

1. Initially more paperwork for the doctors in the emergency department, which will decrease with time, experience and familiarity
2. Initially an increase in the speech-language therapists case load which will decrease with time and experience and familiarity of the emergency department doctors of the dysphagia triage checklist

Ethical aspects such as confidentiality, beneficence and non-maleficence, informed consent and anonymity will be strictly adhered to for all involved in the study. The identity of the hospital and individual participants will be kept confidential throughout the research process. You are under no obligation to take part in the study and you have the right to withdraw at any point during the process of the study.

I hope that this request will be viewed as favourably and should you have any queries, please do not hesitate to contact me or my research supervisor on the listed contact details. For any ethical queries please contact the Human Research Ethics Committee (Medical): (011) 717-1234.

Kind Regards,

Kelly-Ann Kater
Speech Therapist and Audiologist
Mobile: 082-549-2474
Email: kellyannkater@gmail.com

Dr. Jaishika Seedat
Research Supervisor
*Email:*jaishika.seedat@wits.ac.za

Appendix K

SPEECH PATHOLOGY AND AUDIOLOGY

SCHOOL OF HUMAN & COMMUNITY DEVELOPMENT
FACULTY OF HUMANITIES
UNIVERSITY OF THE WITWATERSRAND
Private Bag 3, WITS, 2050
Tel: (011) 717 4577 Fax: (011) 717 4572

Consent Form

I_____(name), in my position as _____(position) at_____ (name of hospital) agree to participate in the study titled *"Triaging for dysphagia in public emergency departments: A Pilot Study".*

I understand that there will be no remuneration for participating in this research and reserve the right to withdraw from the study at any stage with no negative consequences.

Signature: _____

Date: _____

Witness 1: _____

Witness 2: _____

Appendix L

Place: _____ Time: _____

Duration: _____ Date: _____

Environment	
Equipment	
Doctors	
Patients	
Assistant staff	
Hospital procedure	

Appendix M

Record Review Data Collection					
	Patient Name	**Diagnosis**	**Triage Results**	**Diagnostic Results**	**Patient Code**
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

Appendix N

Patients referred to the speech therapy department

Patient	Diagnosis	Date of Admission to MEU	Dysphagia Triage Checklist Results	SADS Results	Speech Therapy Referral	Date of Speech Therapy Initial Assessment	Speech Therapy Feedback:
#1	Acute gastroenteritis, Lower respiratory tract infection, seizures, known epileptic	27 April 2017	Fail- not alert/awake; unable to breath freely; non-communicative; could not cough on command	Fail- Could not assess due to poor level of alertness	Yes- patient was referred by the researcher on 27 April 2017	10 May 2017	Diagnosis- parasuicide, hypoxic brain injury; cardiac arrest 02 May 2017; poor level of arousal; drooling which indicates poor sensation; liquid swallow: anterior spillage, delayed oral swallow, normal pharyngeal swallow, multiple swallows, no signs of aspiration. Plan: Soft ward diet with thickened liquid
#2	Acute gastroenteritis	24 April 2017	Fail- Not managing own saliva;	Fail- weak/breathy vocal quality	Yes	N/a	Non-neurological diagnosis therefore not appropriate referral.

			wet/hoarse vocal quality				***no record of patient found during retrospective record review in the speech therapy department***
#3	Squamous cell carcinoma of the left mandible	14 June 2017	Fail- wet/hoarse vocal quality	Fail- facial asymmetry	No- not referred to the speech therapy department the facial asymmetry (caused by long standing squamous cell carcinoma on the left mandible) was not affecting speech or swallowing	N/a	N/a
#4	Cerebrovascular accident	25 April 2017	Pass	Fail- left facial weakness, slurred speech, oral residue following puree and soft solid consistency	Yes	Unknown	Inappropriate referral as patient was later diagnosed with psychosis and metabolic syndrome

#5	Cerebrovascular accident affecting the left middle cerebral artery	03 May 2017	Pass	Fail- right facial weakness	Yes	04 May 2017	Patient presented with a normal dry swallow and is able to produce a cough on demand. Thin liquid: normal oral and pharyngeal phase, anterior spillage, no clinical signs of aspiration. Thick liquid: normal oral and pharyngeal phase, no clinical signs of aspiration. Semi Solid: normal oral and pharyngeal phase, no clinical signs of aspiration. Plan: Full ward diet
#6	Extrapyramidal signs of unknown cause	25 April 2017	Pass	Pass	No	26 April 2017 by treating doctor	Diagnosis- neurocysterosis; mildly slurred speech some misarticulations on multi-syllabic words. Plan: patient for discharge
# 7	Headache, known epileptic	27 April 2017	Pass	Pass	Yes- patient presented with mild word finding	Unknown	No feedback given regarding patient. No record of patient found during

		difficulties and a dysfluency	retrospective record review in the speech therapy department *no record of patient found during retrospective record review in the speech therapy department