A Cross Sectional Survey of Constipation Prevalence and Laxative Use among Older Adults Residing in a Nursing Home Setting in Ireland

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Declaration

I declare that this thesis, which I submit to RCSI for examination in consideration of the award of a higher degree: MSc Research is my own personal effort. Where any of the content presented is the result of input or data from a related collaborative research programme this is duly acknowledged in the text such that it is possible to ascertain how much of the work is my own. I have not already obtained a degree in RCSI or elsewhere on the basis of this work. Furthermore, I took reasonable care to ensure that the work is original, and, to the best of my knowledge, does not breach copyright law, and has not been taken from other sources except where such work has been cited and acknowledged within the text.

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Abbreviations
ABA – An Bord Altranais
BMA - British Medical Association
BSC – Bristol Stool Chart
CBPS- Committee of Best Practice and Standards
EBP – Evidence Based Practice
EU – European Union
HIQA – Health Information Quality Authority
HSCB – Health and Social Care Board
HSE - Health Service Executive
JFC - Joint Formulary Committee
NCAOP - National Council on Aging and Older People
NHS – National Health Service
NICE – NICE Institute of Health and Clinical Excellence
SPSS - Statistical Package for the Social Sciences
UK – United Kingdom
US – United States
USA – United States of America
WGO – World Gastroenterology Organisation
WHO – World Health Organisation
Abstract

Background: Constipation is a common, distressing and troublesome condition and whilst it may affect any one of any age, it is said to be one of the most common complaints among the older person population. Indeed, prevalence rates within this population are high as 74%. In the older person population disturbed bowel function is often associated with depression, immobility and isolation. The costs of this condition are high, not only for the individual sufferer, but for society as a whole. Whilst laxatives are said to be the most frequently prescribed drugs in long term care settings, the costs of these treatments have not been systematically reported. From an Irish perspective, there appears to be a significant gap in the evidence based literature in relation to this condition.

Aim of Research: The aims of this research were to: determine the prevalence of constipation in an Irish nursing home population; to assess the use of laxatives among the study population; to determine local policy in management of constipation in the nursing home population; to conduct a micro cost analysis of current treatment of chronic constipation.

Methods: A Quantitative cross-sectional descriptive survey was carried out. A total of 94 residents from 6 nursing homes in Ireland participated in this study.

Results Of all individuals residing in the 6 nursing homes, 38% were suffering with constipation. The mean age of participants was 83 years and 64% were female. The mean Barthel score was 9.60 indicating a medium level of dependency. The mean BMI was 27.41 indicating that the participants were, on average, overweight. Constipation prevalence was higher among females and among older rather than younger participants. The use of laxatives was very high, with all participants prescribed at least one laxative; however, some (38%) were using 3 to 5 different treatments for constipation. Management strategies were diverse suggesting a lack of a uniform approach to both the prevention and management of constipation. Furthermore, related costs of management were higher than those cited in previous international research.

Conclusion: Over one third of the population residing in the nursing home setting were constipated. Thus, the prevention and management of constipation is an important issue among this population. Management approaches lacked uniformity suggesting the need to focus on a standardisation of policies of assessment and prevention.
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Chapter 1: Introduction
Chapter 1: Introduction to the Thesis
1.1 Introduction
Constipation is an unpleasant and often distressing condition which can affect anyone at any time (Kyle 2011). This introduction to the thesis will provide a brief exploration of this condition and, in order to enhance readability, this chapter will be divided into 5 sections. Section 1 will provide a brief introduction to constipation and in doing so outlines a definition of constipation and presents the prevalence of this condition. Section 2 examines the associated risk factors for constipation, whilst section 3 outlines how this condition may impact on the life of those who sufferer with this condition. Section 4 and 5 provide a discussion of the current management and costs associated with constipation. Finally a summary is provided and this is followed by an outline of the format of this thesis.

1.2 Definition of constipation
Constipation is difficult to define, indeed throughout the literature there are many variances in analysis and classification of this condition. Linton et al. (1997) described constipation as a ‘phenomenon’ wherein patients experience a decrease in frequency of bowel motions along with a prolonged or difficult passage of stools. More recently this condition has been identified as not being a disease but a symptom, indeed, an unpleasant and often distressing one that can have major impact on an individual’s person’s quality of life (Kyle, 2011). Thus, constipation is not, in fact, a disease in entity, but a general term used to describe the difficulties that patients experience with their bowel movements (McCrea et al. 2009). The concept of constipation is further defined by The National Institute of Health and Clinical Excellence (NICE, 2013) wherein they classify constipation as defecation that is unsatisfactory because of infrequent stools, difficult stool passage, or self-reported incomplete defecation.
Kyle (2011) suggests that difficulties in diagnosing this condition relate to the fact that constipation is very subjective in nature. Indeed, whilst patients might identify this condition on the basis of their actual symptoms, health providers tend to relate to constipation in terms of bowel frequency. This may result in a delay in diagnosis of this condition until it becomes a significant problem (Kyle 2011). Most, if not all research findings, reflect that constipation is a notably troublesome disorder which is poorly understood (Peate 2005, Kyle 2007 and Kyle 2011). The severity of this disease can vary from slight, wherein it may cause little or no disruption to a person’s life, or it can be unnecessarily severe, in which case constipation and the pain associated with it have a serious negative effect on the sufferer’s quality of life (Peate, 2005, Kyle 2007 and Kyle 2011).

1.3 Prevalence of constipation
The literature repeatedly reiterates that there is a lack of a unified definition of constipation and in reference to this there is the belief that ambiguity may be a contributory factor, not only regarding the difficulties in diagnosis but also in leading to discrepancies in defining the precise prevalence of the disorder.

The figures of reported constipation vary throughout the world. Boyle (2013) suggests that this condition is much more prevalent in the Western world with variances in prevalence rates of between 2% to 30% reported. Peate (2005) suggests that one fifth of the population in the United Kingdom (UK) suffer from constipation at some stage in their lifetime, furthermore, 20% of that population may be affected at any one time. However, from a UK perspective, the NICE (2007) suggest that prevalence rates vary between 8.2% and 52%. Hosia-Randell et al. (2007) and Rao et al. (2010) found that, in Finland, more than half of nursing home residents report constipation. In addition, Chassange et al. (2012) suggest that from their
analysis of this condition in France and Belgium, these figures are as high as 74% amongst older people in general. In the United States McCrea et al. (2009) suggest that constipation figures fluctuate from state to state with variances of between 2% to 28% of people experiencing this condition at any time (McCrea et al. 2009).

From an Irish perspective, Gallagher & O’Mahony (2009) suggest that between 2% to 20% of adults of all ages suffer with constipation. However, they stress that chronic constipation is a much more significant a health problem in the older population in Ireland. Their studies reveal that 30% to 40% of the population over 65 years, living in community environments, report this condition, with the prevalence of chronic constipation amongst adults of all ages in these settings ranges from 2% to 27%. Most researchers agree that constipation is much more prevalent in the older person population with twice as many men than as women reporting symptoms of this condition (Boyle 2013, Tariq 2007 and Kyle 2007). It is evident therefore, that constipation is a common complain among people of all ages, however, is more prevalence among the older population.

1.4 Risk factors for constipation
Linton et al. (1997) stress that constipation is not an inevitable consequence of older person, adding that it is not age in itself that leads to constipation. Vrees & Weiss (2002) concur pointing out that younger people with the same underlying pathologies as their older counterparts are at the same risk of experiencing constipation (Linton et al. 1997 and Vrees & Weiss 2002). Indeed, throughout the literature it is generally accepted that constipation can occur in people of any age, from the very young to the very old. However in general, constipation is more common in the older population. Castledine et al. (2007) found that the causes of constipation appear poorly understood and whilst the literature does elude to many risk factors these have been found to be conflicting and sometimes overlapping. However, the
general consensus appears to be that whilst there are many causes, these may be summarised as psychological, physiological, social and environmental and are most often referred to in terms of the type of constipation involved (Castledine et al. 2007). Constipation is further defined as being simple (primary) or secondary constipation.

Simple or primary constipation appears to be the most common and is said to be caused by extrinsic factors, i.e. factors that originate from outside of the body. These extrinsic factors include reduced fluid intake, reduced dietary fibre, reduced mobility and tiredness or general lethargy which may result from inactivity (Fosnes et al. 2011).

Secondary constipation, on the other hand, is said to result from intrinsic influences, such as physiological diseases affecting bowel function, endocrine disorders, metabolic disorders, neurological, and pelvic disorders. Psychiatric and psychological conditions and polypharmacy (the use of multiple medicines) are also associated with this type of constipation. Polypharmacy is synonymous with older person populations and is therefore commonly cited within the literature as attributing to the heightened risk of constipation in this population (Grainger et al. 2007).

Many other risk factors are also attributed to this condition, such as poor toileting facilities, depression, anxiety and low socio-economic status (Kyle 2007). However, older person is deemed to be a significant risk factor for constipation with many researchers deeming it to be ‘a condition of older person’ (Tariq 2007, Woodward 2012 and Boyle 2013). Foxx-Orenstein and Gallegos-Orozco (2013) disagree with constipation being considered synonymous with older person, arguing that the many contributing factors relating to this condition can pre-dispose any individual of any age to this condition, thus highlighting the need to recognise the causes of constipation including their related symptoms (Grainger et al. 2007).
1.5 The impact of constipation

Constipation is characterised by a collection of symptoms, furthermore, a person may present with an acute symptom of constipation, but if poorly managed, this may develop into a chronic problem leading to faecal impaction, incontinence of faeces and delirium (McCrea et al. 2009). Tariq (2007) stresses that if symptoms are not recognised at early onset of this condition, the patient may need to be hospitalised.

Often patients will report feeling bloated, with headaches, fatigue, and loss of appetite leading to weight loss, nausea and vomiting (Tariq 2007). Diagnosis can be difficult at times as many patients feel much embarrassment in reporting constipation and therefore are often reluctant to discuss their symptoms (Rao et al. 2010). Constipation can be the cause of much pain and suffering, indeed, individuals experiencing this condition often report more restrictions on physical functioning than non-constipated people of a similar age group (O’Keeffe et al. 1995). In addition to this, research suggests that many sufferers will not report this condition to their health care providers, and thus often self-medicate using over the counter laxatives thereby incurring unnecessary financial burden and increased anxiety (Kyle 2007). Therefore, Kyle (2007) argues that health care professionals need to be mindful of the psychological distress constipation may cause to the individual and thus need to overcome barriers to allow for successful assessment, diagnosis and management of this condition.

1.6 Management of constipation

The National Prescribing Council (NPC) in the UK (2004) advises that there is no evidence to suggest that there is any health gain from the long term use of laxatives. Despite this, laxatives are very commonly used for the treatment of this condition. Furthermore, there is concern that long term use increases the risk of dependence on laxatives (NPC 2004).
Figures from the National Health Service (NHS) in the UK (2007) indicate that 14 million prescriptions were dispensed for laxatives in the 12 month period from 2006 to 2007 in England, at a cost of 60 million pounds sterling. Furthermore, 78% of people in nursing homes in the UK were, at that time (2007), being prescribed laxatives, the most common of which were bulk forming agents, stimulants, osmotic laxatives, stool softeners and Prokinetic agents (NHS 2007).

From these figures it is reasonable to suggest that constipation is a major economic burden on each individual sufferer. Whilst there is little or no evidence of costs of this condition from an Irish perspective, it may only be assumed that costs are high and therefore a concern which needs to be addressed. There is a need for more study of this economics of this condition, not only in relation to the individual sufferer but essentially to gain understanding of how this might be of effect on society as a whole.

Boyle (2013) argues that laxatives should only be considered when all other management strategies have failed. Therefore, a comprehensive assessment of any patient should raise concern of the presence of pre-disposing factors associated with this condition, therefore allowing for development of a management strategy primarily focussed on preventative measures. Indeed, Kyle (2007) recommends a proactive approach focussed on lifestyle and dietary changes addressing how constipation might be avoided. This, Kyle (2007) believes, will help to alleviate the profound and debilitating effects that this condition might have on the individual sufferer.

Lifestyle changes and laxatives are currently thought to be the mainstay of management of constipation but newer treatments are being developed. Health care providers therefore need to be able to identify and appraise the relative merits of these new developments, thereby
keeping their skills and knowledge up to date in order to implement care that is based on the best available evidence (Woodward 2012).

NICE (2009) suggests that if constipation is inadequately managed complications may arise which will serve to compound the unnecessary pain and suffering caused by these complications, thus, increasing the risk of morbidity. An emerging theme throughout the literature is the suggestion that constipation as a condition which is poorly understood. Furthermore, many researchers pinpoint the variations in definition of constipation as a notable cause for this lack of understanding change (Castledine et al. 2007, Kyle 2007 Tariq 2007, Foxx-Orenstein & Gallegos-Orazco 2013).

A lack of a clear definition of constipation, in addition to the need for greater understanding of this condition overall, suggests that there is a need for further research into constipation. Further research will provide greater insight into this condition, allowing investigation of the prevalence, associated risk factors, alternative management strategies and indication of the associated costs. Most importantly this will highlight the negative effects of this condition on the quality of life for the individual sufferer, thus providing the impetus for a change in the current approach to constipation prevention and management.

1.7 Summary
Constipation can be a problem in all age groups however, is most prevalent in the older population. Whilst it is a condition related to multiple factors, it is as yet poorly understood and therefore remains under-diagnosed, with a lack of a standardised approach to management. The lack of agreement on a unified definition of this condition is thought to contribute to a delay in diagnosis. This results in enhancing the negative impact on the quality of life of the sufferer (Tariq 2007). However, constipation is a treatable condition and with
the correct knowledge and understanding it may be prevented (Richmond & Devlin 2003). It is clear therefore that this chronic condition needs further exploration.

1.8 Outline of Thesis
The overall aim of this thesis was to conduct a study to determine the prevalence, current management, and costs of constipation in the older person in the residential setting in the Republic of Ireland. This study also involved a micro cost analysis of current treatment constipation within the study population, therein facilitating the development of a health economic argument pertinent to the management of constipation in this study group.

The thesis is presented in 7 chapters. Chapter 1 has presented an introduction to the thesis and is followed by Chapter 2 which is divided into 5 separate sections. Section 1 reviews the prevalence of this condition. Section 2-3 provides discussion the impact on quality of life and the changing demographics in relation to the individuals experiencing this condition. Section 4 allows discussion of costs and section 5 provides review of the current management.

Chapter 3 is divided into 2 sections. Section 1 provides a review of the methodological considerations in research and Section 2 presents a discussion of the chosen research methods for this study. Chapter 4 presents the results of this current study with chapter 5 providing a discussion of the research findings. Chapter 6 discusses the strengths and limitations of the study and the recommendations arising from this work. Finally, chapter 7 presents a conclusion of the thesis.
Chapter 2: Literature Review
Chapter 2: Literature review

2.0 Introduction

Constipation is a common disorder, and one that adversely affects sufferers each and every day. The profound effects of this condition yield negative consequence on all activities of daily living for the individual (McKay et al. 2012). Due to the lack of a unified definition of this condition prevalence is often difficult to determine (Castledine et al. 2007). Within the literature there is agreement that this condition may affect up to 20% of the population at any one time (Boyle 2013, Roa et al. 2010). Advanced age is a notable risk factor with figures showing significant increase in prevalence rates over the age of 70 years (Leung et al. 2011). Successful diagnosis and timely management will alleviate unnecessary pain and suffering and help maintain quality of life within this vulnerable population (Tariq 2007). Leung et al. (2011) stress that management is a major problem within health services, suggesting a chronic economic burden on patients and these related services. An emerging theme from the literature relates to the high rate of laxative use within nursing home environments (Tariq 2007, Schnelle et al. 2009, and Fosnes et al. 2011). However, The American College of Gastroenterology (ACG) Chronic Constipation Taskforce (2005) report that laxatives are often associated with adverse effects on the patient. Leung et al. (2011) found that newer treatments are available but they also note a dearth of evidence based data in relation to these. This not only suggests the need for further investigation into the management of this condition, but given that inadequate management may lead to further complications, both physical and psychological it further highlights the need to provide for better overall understanding of this chronic condition (Norton 2006)

This investigation proposes not only to gain a better understanding of this chronic condition, but to allow for greater recognition of the impact on the individual sufferer. Such
understanding may assist in the drive for the development of new strategies that may lead to the diminishment of this illness.

To enhance readability the author has divided this chapter into 5 sections. Section 1 reviews the prevalence of this condition. Section 2-3 provides discussion the impact on quality of life and the changing demographics in relation to the individuals experiencing this condition. Section 4 allows discussion of costs and section 5 provides review of the current management.

This chapter reviews the literature surrounding constipation. This inquiry and further literature exploration pertaining to this condition involved a search strategy in which the author searched the relevant data bases, i.e. CINAHL, Pubmed, Medline and Cochrane databases. These searches were refined by using date parameters from 2000 to present day. This involved limiting results to English only, and including only original research within these search criteria. The search terms used were constipation, risks, management, older person, laxatives, and gastro-intestinal conditions. This allowed refining this search and therefore optimising strength and validity of the given results. However, it was also necessary to outline some important empirical finding in relation to this research and in relating to these statistics, guidelines and conferences, therefore, a review of the grey literature via web search and Google scholar was also included (Aveyard 2010).

Section 1
2.1.1 Introduction
In order to fully understand constipation it is important to comprehend its impact on the individual sufferer, society and the health service as a whole. Within this section the aim is to explore the prevalence of constipation. Discussion and inquiry of the prevalence of any
condition allows us to determine the actual presence of this condition. These figures and those of incidence rates should allow determination of the necessary volume of effective strategies needed to reduce these figures, whilst also allowing for investigation of the need to provide effective management of the condition. This section will focus on these discussions, beginning with a definition of constipation.

2.1.2 Defining constipation
The condition of constipation is poorly understood perhaps due to the fact that this condition can be difficult to adequately define (Getliffe & Dolman 2005, Tariq 2007, Marsh & Sweeney 2008, and Boyle 2013). Woodward (2013) suggests that constipation is a symptom-based, subjective disease that is perceived differently by different people. Indeed, Boyle (2013) suggests that because bowel evacuation is known to vary from person to person, defining what is said to be ‘normal’ is difficult. As such, available definitions are often inadequate, arising due to the fact that this condition is largely a subjective one (Tariq 2007). Therefore, there is often a lack of correlation between self-reporting of constipation and epidemiological studies, yielding challenges in understanding the exact scope of the problem. Indeed, because patients use different terminologies when referring to constipation, it is important that healthcare providers take the time to understand this condition and how it may present (Castledine et al. 2007).

The Rome criterion appears to be the most commonly accepted definition of functional constipation. The Rome Foundation was established in 1981 by Drossman et al. to standardise definition of gastrointestinal disorders (Drossman et al. 1981). In 2006 this expert based, multi-national committee, developed the Rome III classification (see Appendix 1) of chronic constipation which has emerged as the most widely used for research purposes, allowing for determining the prevalence of constipation within the intended research

This Rome III criterion defines functional constipation as the presence of at least two of the following symptoms, for at least 12 weeks; or with onset of the symptoms six weeks prior to diagnosis.

- Lumpy or hard stools,
- The sensation of incomplete evacuation,
- Use of digital managers,
- Sensation of anorectal obstruction or blockage with 25% of bowel motions,
- Decrease in stool frequency, i.e. less than three bowel movements a week.

(Rao et al. 2010)

According to Donaghue et al. (2008), a general rule of thumb for health care professionals is that in most cases, patients will be constipated if bowel evacuation decreases sufficiently to cause discomfort. This stresses the importance of understanding the individuals experience rather than sticking rigidly to a set of pre-defined criteria.

Throughout the literature researchers repeatedly refer to the different classifications or types of constipation and the need to, not only understand these different types, but to provide focus on their underlying causes in order to arrive at an adequate diagnosis and management of constipation (Richmond & Devlin 2003, Boyle 2013, Foxx-Orenstein & Gallegos-Orozco 2013, Woodward 2012).

Constipation is most often classified as primary or secondary. Foxx-Orenstein and Gallegos-Orozco (2013) in their delivery at The World Digestive Health day (WDHD 2012) advised that primary constipation or slow transit constipation, results from factors outside of the
body, such as insufficient intake of dietary fibre, fluid intake or decreased mobility. This slow passage usually occurs in the large intestine and can lead to a back up of faecal matter within the gut; this will cause patients to have difficulties evacuating stools and can be the cause of some abdominal pain, cramping and general feelings of unwell. This may also lead to occurrences of uncontrollable soiling and become a cause of some distress (Leung et al. 2011). Conversely, constipation classified as secondary is said to be related to anatomical, metabolic and pathological influences, which may stem from physical conditions, illness or medications. Secondary constipation is often caused by diseases such as Parkinson’s, or may even arise due to the side effects of drugs (Woodward 2012). These drugs can include anti-histamines, anti-psychotics, anti-depressants, calcium supplements, diuretics, antacids and opioids (Boyle 2013). Secondary constipation is also said to be a cause of cramping, bloating, pain and may be the cause of much distress. Some researchers might suggest that if these influences are changed, this condition may be addressed, however, they also stress that, most especially within the older population, these changes are not also possible. Many individuals may also be suffering from constipation diagnosed as dysynergic constipation and/or isolated slow transit constipation. These types of constipation are related to neurological conditions, such as Parkinson’s disease or stroke. This may result in abnormal bowel function, causing paradoxical contraction within the intestine as opposed to the normal relaxation necessary for normal stool defecation. In addition, Slow transit constipation is sometimes related to as pelvic floor dysfunction and may cause a failure in peristalsis (normal wave like rhythms of movement in the intestines), which will cause delay in the delivery of the stool to the rectum, therein resulting in symptoms of constipation. (Richmond & Devlin 2003, Boyle 2013, Foxx-Orenstein & Gallegos-Orozco, 2013 and Woodward 2012).
2.1.3 Prevalence of Constipation
Boyle (2013) indicates that constipation will affect at least 12% of the population at some point in their lives, with incidence varying from 2-30% in the western world (Boyle 2013). Foxx-Orenstein and Gallegos-Orozco (2013) note figures from Asia of 8.7% and figures of 7% from Singapore. In addition, prevalence appears much higher in females than males, 11% versus 3% respectively. Furthermore, there appears to be an increase in prevalence amongst the older person, children, expectant mothers, black people and those from low socio-economic backgrounds. However, it is important to note that constipation can affect people of all ages, including children and young people (Tariq 2007, Boyle 2013). Furthermore, Boyle (2013) suggests that most pregnant women will report symptoms of constipation, especially in later pregnancy, usually in their second or third trimester.

Li-Wei et al. (2008) cite constipation as one of the most common digestive complaints in the United States. From their studies they note figures of 2% to 28% in the general population and 15% in the older population. Leung et al. (2011) found that this condition appears most prevalent in older person women, where the risk is 2% to 3% greater. They also found that within the general population of North America between 1.9% and 27.2% experience constipation allowing for variations of 50% to 74% among an institutionalised older person population. Foxx-Orenstein and Gallegos Orozco (2013), also in the United States, found that 20% of women and 16% of men over 65 years consider themselves to be constipated and that one fifth of this population suffer from constipation at some time in their lives.

Chassange et al. (2012) outlines figures from France and Belgium and indicate that the prevalence may be as high as 74% in older people. Figures from New Zealand suggest that approximately 22% of people over 70 years of age living in the community suffer this condition (Tariq 2007). Figures from The National Institute of Clinical Excellence (NICE
2009) in the United Kingdom suggest variances of between 3% in young adults to 20% or more in the older person population. Again, as in previous studies, figures are higher in women than in men, suggesting that twice as many women than men report symptoms of this condition. However, prevalence figures within this female population also vary widely from 8.2% to 52% (Norton 2006).

In Finland Hosia-Randall et al. (2007) noted that among older people residing in nursing homes 57% of women and 64% of men reported constipation; whilst in Norway Fosnes et al. (2011) found that 74% of patients in nursing home environments experienced symptoms of constipation. From an Irish perspective, Gallagher & O’Mahony (2009) suggest that between 2% to 22% of the population suffer with constipation, furthermore, of those over 65 years of age, living in the community care setting, 30% to 40% experience symptoms of this condition. Again, in concurrence with previous research, twice as many women than men are reporting symptoms of this condition. Another study carried out from an Irish perspective by March & Sweeney (2008) found that of people with intellectual disabilities (ID) in residential settings, approximately one third suffered with constipation. Among palliative care patients the Health Service Executive (HSE 2013) in Ireland suggest figures of 30% to 90%, whereas Kyle (2007) found that 50% to 80% of palliative care patients suffered from constipation and again found that prevalence rates were substantially higher in women than in men. This high rate of prevalence in women is noted throughout the literature (Hosia-Randall et al. 2007, Fosnes et al. 2007 and Castledine 2007). This clearly establishes the need for further research in this area; Questions need to be asked as to why these figures are apparently so high within the female population. Is this because women are living longer than men? Or is it because women are more susceptible to this condition than their male counterparts? This does, without doubt, highlight the need for further research in this area.
2.1.4 Why the variance in figures?
There are a number of factors which contribute to the variance in figures of prevalence of constipation. In order to fully understand, not only the reason for these variances, but the condition as whole it is necessary to explore these variances.

As already ascertained, individual patient factors influence the epidemiology of this condition, especially as it is a subjective disorder and therefore perceived differently by different people (Boyle 2013) However, one important issue is that constipation is poorly recognised and ineffectively treated (HSE 2013). This arises due to a lack of a unified definition of this condition and therefore the absence of consensus of what constitutes constipation. These disparities have been discussed often within the literature. The consensus is that a lack of an adequate definition of this condition results in inaccuracies in achieving exact figures relating to this condition (Gindsberg et al. 2007, Tariq 2007 and Leung et al. 2011). However, Foxx-Orenstein & Gallegos-Orazco (2012) believe that discrepancies in prevalence can be attributed not only to the lack of a unified diagnostic criterion, but also to the number of patients seeking medical care, because those who are not accessing their general practitioner, are not being effectively diagnosed, are self-treating, and often remain unknown to the system.

Diagnosis of constipation is most usually determined using The Rome III criteria. This criterion is suggested by researchers to be the tool of chaise for use, both for research purposes and to allow effective determination of the presence of constipation. Many researchers appear to endorse this criterion and suggest that this provides that all researchers might be using the same definition (Getliffe& Dolman 2005, Castledine et al. 2007, Tariq 2007, Leung et al. 2011, and Boyle 2013).

However, it appears that the validity of these criteria has recently been questioned. Indeed, Acalovschi (2012) suggests that in using these criteria it is not always possible to practically
differentiate between patients with constipation and those presenting with irritable bowel syndrome. Whilst these conditions appear on the same spectrum of gastrointestinal conditions, Acalovschi (2012) stresses they are two very different conditions which need to be treated as such. Kyle (2007) further contends that the Rome III criteria have limited use in practice as many patients develop and require treatment for constipation before 12 weeks has elapsed. Indeed, the American College of Gastroenterology Task Force (2005) also support this view suggesting that most people do not fulfil the Rome III Criteria. Furthermore, because individuals' bowel habits differ substantially, it is therefore difficult to use in this definition practice.

2.1.5 Summary
Owing to the lack of definition of constipation and inconsistencies in its classification, prevalence figures often differ depending on the method of data collection. However, it is evident that some groups within the population are more at risk than others. Figures vary within particular groups, for example pregnant women, individuals with disabilities, those nursed within palliative care services; those suffering with underlying conditions all have a higher prevalence than others in the population. However, figures suggest the constipation is most notable among Ireland's older population. Changing demographics indicate that our older population is said to increase significantly in the future and as a result there will be a risk of a corresponding increase in the number of people with constipation (Barrett et al. 2011).

Section 2 Risk Factors and Assessment
2.2.1 Introduction
In this section risk factors for the development of constipation will be discussed. This discussion will provide insight into the nature of this condition including the extrinsic and intrinsic influences that impact on the risk of constipation.
2.2.2 Definition of Risk
In medical terms risk is defined as “Something that increases a person's chances of developing a disease” (Oxford English Dictionary 2014:493)

2.2.3 The risk to the older adult
Constipation is a common complaint in older adults with prevalence figures suggesting that this population is very vulnerable to this condition. Woodward (2012) notes that older persons, particularly those with underlying medical conditions, do commonly experience this condition. This causes much distress and suffering, not only in physical terms but, most worryingly often of a psychological nature this notable discomfort and relative anguish to these individuals has a negative impact on their quality of life; (Norton 2006) furthermore, the older person is susceptible to both primary and secondary constipation.
Both of which are further related in section 3 of this chapter.

Kyle (2007) identified that simple, or primary constipation, which is said to be caused by a reduced dietary fibre, fluid intake, reduced mobility and general fatigue, is most prevalent in the older population. Hospitalisation and a change of environmental settings also contribute to primary constipation. Furthermore, reduced mental and physical stimulation have been associated with an inability to toilet appropriately, causing distress and functional inability. Indeed, instances of primary constipation may be increased by reduced mobility and or the conscious retention of faeces (Boyle 2013). This type of constipation is more prevalent amongst older people but with an increase in dietary fibre, fluid intake and physical exercise these incidence rates can be decreased (Chassenge et al. 2012). Secondary constipation can be caused by a combination of variables, notably metabolic, neurological, psychiatric,
psychological or colonic disorders including a wide variety of medications (Chassenge et al. 2012).

It is suggested that 25% of secondary constipation may be as a result of pelvic floor dysfunction (Chassenge et al. 2012). This is common in older people due to poor pelvic floor muscle control, which is suggested to have an age related dimension. Indeed, in the older person population there is a 37% reduction in the number of nerve cells, causing less control in the smooth muscle necessary for normal transit of faeces (Getliffe & Dolman 2005). Conversely, nerve cells may cause paradoxical contraction rather than relaxation of the necessary muscles causing difficulties in evacuation. This can also arise in patients with neurological diseases such as Parkinson’s or stroke (Norton 2006).

In their review of the prevalence of constipation symptoms in faecally incontinent nursing home residents, Schnelle et al. (2009) found that other symptoms need to be taken into account when studying prevalence of constipation rather than just frequency of bowel motion alone. These symptoms include straining and differing stool consistency, indeed, in one study using self-reporting data, patients reported straining in more than twenty five per cent of bowel movement episodes (Marfil et al. 2005). Despite this, straining does not appear in any definition or classification of constipation.

Wisten and Messenger (2005) note that constipation is a common complaint among the older person population, but they stress that this condition should not be considered just a part of the normal process of getting older. However, Foxx Orenstein and Gallegos Arozco (2013) argue that the changes in colonic motility and physiology predispose many of this aged population to constipation.
Much discussion within the literature centres on the relationship between the use of certain medications and constipation as a side effect of these medications. For example, antacids, Anticholinergics, antidepressants, antihistamines calcium channel antagonists, diuretics, Iron, levodopa, opioids, non-steroidal anti-inflammatory drugs, psychotropic drugs, sympathomimetic medication (Grainger et al. 2007, Tariq 2007, Woodward 2012 & Boyle 2013). Medication may slow down the muscular movement needed to allow the passage of stool with the bowel (peristalsis) and therefore may cause an individual be constipated (Tariq 2007). However, despite this, it is not always possible to modify medications, most especially in relation to the older person. The concept of polypharmacy is synonymous in older person and in turn constipation is unwittingly deemed by some to be a condition of older persons (Grainger et al. 2007, Tariq 2007, Woodward 2012, and Boyle 2013).

2.2.4 Being female as a risk factor for constipation
Kamm (2003) suggests that 2 to 3 times more women are likely to report symptoms of constipation when compared to men. Charelli et al. (2000) concurs that hormonal changes in peri/post-menopausal women may lead to an increased prevalence of constipation in this population. Furthermore, a decrease in progesterone levels in older women may cause delay in small bowel/colonic transit, therefore causing constipation. Norton (2006) also suggests the weakness in pelvis floor muscles resulting from pregnancy and childbirth may be a contributing factor. This leads to pelvic dysfunction and the inability to coordinate abdominal smooth muscle. Indeed, this is a known cause of difficulties in transit of faeces and adequate evacuation (Leung et al. 2011). Importantly, Norton (2006) highlights that whilst failure to relax the anus is often associated with previous pain or trauma; it has also been associated with abuse or even eating disorders.
2.2.5 Being pregnant as a risk factor for constipation
Jefferson & Croton (2013) suggest that, excluding nausea and vomiting, constipation and haemorrhoids are the most common complaints in pregnancy. Therefore, there is a need to promote bowel health within this population, particularly considering that fibre intake in pregnant women often falls short of the recommendations. Endocrine changes in pregnancy leads to symptoms of constipation, especially within the second and third trimester. This may be due to iron supplements which are often prescribed at this stage of pregnancy as during this time a woman’s daily requirements doubles (Boyle 2013). Constipation in pregnancy has also been related to physical inactivity, this, along with the psychological effects of pregnancy and the fact that many pregnant women are known to reduce their fluid intake at this time due to urge to urinate more frequently have all been related to prevalence within this population (Boyle 2013).

The National Institute for Health and Clinical Excellence (NICE 2010) support the need for adequate dietary fibre in pregnancy, unfortunately, no specific guidance is given as to how much fibre or fluid should be consumed. However, Jefferson and Croton (2013) suggest that an increase in fibre intake of at least 10 grams a day would be beneficial in order to help prevent constipation and haemorrhoids.

2.2.6 Being a child as a risk factor for constipation
Constipation is a common complaint in children with figures of approximately 30% reported. Furthermore, this condition is the 2nd most frequent reason for referral to paediatric gastroenterology clinics (NICE 2010). Whilst figures show that constipation may occur at any stage, Boyle (2013) suggests that it occurs most often during toilet training, however, may also occur due to underlying illness, such as cystic fibrosis, Down’s syndrome, autism, hypothyroidism and neurological conditions (NICE 2010). Idiopathic constipation occurs with no known cause in children however, may relate to poor diet and fibre intake (Boyle
2013). Constipation in children should be thoroughly investigated as it has often first manifested due to maltreatment or abuse (NICE 2010).

2.2.7 Palliative care as a risk factor for constipation
Constipation is often the most common symptom experienced by patients with advanced illness (Clark et al. 2013). Although constipation can occur at any stage in the course of disease, it causes most difficulty at the advanced stage of illness yielding considerable distress. It is suggested that there is strong evidence that the use of opioids (pain relieving medication) can be a main cause of constipation in this population (The Health Service Executive 2013). However, there are other causative factors, such as weakness, fatigue, metabolic disturbances, neurological disorders and insufficient food/fluid intake which might lead to elevated prevalence in palliative care (Librach et al. 2010). Goodman & Wilkinson (2005) agree that whilst causes may be found in both intrinsic and extrinsic factors, constipation in palliative care is a most problematic effect of pain management. However, worryingly, Goodman and Wilkinson (2005) found that in an evaluation of 11 hospices in the United Kingdom, assessment of patients bowel function was lacking with many patients recognised as being severely constipated not being effectively managed.

2.2.8 The Risk to those with Intellectual disabilities
Constipation has received very little attention in terms of management and prevention in intellectual disability services (Marsh & Sweeney 2008). Unfortunately it is often a symptom mostly shrouded by the intellectual disability itself. Again prevalence in this population is said to be elevated due to the use of many opioids and other pain relieving medication and also due to poly-pharmacy. However, constipation among those with Intellectual Disabilities (ID) may also be a consequence of limited physical and communication abilities. Furthermore, within this population constipation may occur due to anxiety and depression and in some instances, due to continually ignoring the urge for defecation (Moss et al. 2008).
2.2.9 Risk assessment
Kyle (2011) suggests that adequate assessment of patients reporting symptoms of constipation can be somewhat challenging to health care providers. In consideration of the multifactorial causes linked to this condition of bowel dysfunction, Marsh & Sweeney (2008) have suggested that all of these factors need to be taken into consideration to provide a personal symptom profile for any individual experiencing symptoms of this condition. Indeed, Thompson et al. (2012) stress that until this risk is sufficiently assessed health care providers will not have sufficient knowledge or understanding to initiate preventative measures aimed at meeting each individual’s needs. Assessment is the mainstay of prevention and health promotion in relation to any condition, allowing the health provider to make informed decisions within clinical practice and development of management approaches to adequately control the risk (Castledine et al. 2007). A proactive approach is also endorsed by The National Institute For Clinical Excellence (NICE 2007), who, within their guidelines on faecal incontinence (CG49) recommend that healthcare professionals should carry out and record a focused baseline assessment for people with faecal incontinence to identify all contributory factors. While not explicitly focused on constipation this condition is often related to constipation.

There are a wide range of risk assessment tools available and these vary from simple questionnaires to scoring scales (O’Keefe et al. 1995 & Bharucha et al. 2004). However, while these tools are sufficient to assess existing constipation, none actually evaluate the risk of constipation in the first instance (Kyle 2011).

The Norgine Risk Assessment Tool for Constipation (see Appendix 2) is suggested to be reliable and specific and adequately allows for a proactive approach to bowel care (Kyle
2011). This evaluation involves a series of questions to be asked of the patient whilst assessing risk and depending on the score ascertained the health care professional will be in a position to determine the risk of the patient developing this condition (Kyle 2011). Upon review of the evidence base, there appears to be little data concerning the actual validity and reliability of this tool, other than that carried out by Kyle (2011), who is in fact the developer of this tool. None the less Kyle (2011) suggests that the tool be used in conjunction with the Bristol Stool Chart (see Appendix 3). The Bristol Stool Chart was devised by Lewis & Heaton (1997) as a simple method of assessing stool transit time and is often used by health care providers to monitor changes in an individual’s bowel form. This is easily utilised both in clinical practice and research (Lewis & Heaton 1997). References to the use of this tool appear often throughout the literature indicting the use of this tool in both of these areas, clinical practice and research (Grainger et al. 2007, Kyle 2011, Woodward 2012, and HSE 2013).

Castledine et al. (2007) evaluated the Eton Risk Assessment tool for Constipation (see Appendix 4). The research group considered this tool to be a good predictor of constipation however, they further suggest that there may be a need to adapt this tool to maximise its potential in predicting constipation in the older person residing in care home settings. Despite this, Castledine et al. (2007) express confidence that the tool asks the necessary questions regarding medical condition, medications, age, gender, mobility, available toileting facilities and food and fluid intake charts to capture the risk of constipation in this older person population. They also suggest that this tool again be used in conjunction with The Bristol Stool Chart.

Woodward (2012) supports the notion that adequate assessment is paramount and any individual presenting with acute onset of constipation must be treated as priority. The
assessment, they advise, may involve the need for a physical examination, observing any abnormalities, such as haemorrhoids or fissures which might suggest that the patient has already experienced episodes of constipation. Wilson (2005) concurs that there may be need for a physical examination in this assessment process, wherein examination should include abdominal palpitations, noting any distension, pain or discomfort in this area which may suggest the presence of gas, fluid or obstruction, such as a mass or a loaded bowel. A rectal examination will also conclude if the rectum is impacted.

Wilson (2005) further suggests the need for a functional assessment, most especially for the older person, which may allow identifying any co-existing cognitive deficits which may compromise the person’s ability to carry out activities of daily living. For example, difficulties with mobility may have a significant influence on a person who may be constipated, as a lack of ability to readily access toileting facilities may compound the problem. Whilst no one assessment tool is suggested, all researchers appear to agree that there is a need for a thorough risk assessment wherein the health care provider assesses a patient whilst considering symptoms, past history and medical history alongside the multifactorial causes and effects of this condition (Wilson 2005, Tariq 2007 & Woodward 2012). Furthermore, any assessment of constipation should begin, before any questionnaires or scoring charts, with the assessor observing and listening to the patient in order to gain understanding of the patient’s own perceptions of the onset of this condition and their self-reported changes in their bowel function.

In their draft guidelines, the Health Service Executive (HSE 2013) outlines the importance of assessment and evaluation of palliative care of patients presenting with constipation. The guidance suggests that, as in any assessment, a complete history and physical examination is vital. This thorough history taking, involving a step by step assessment of the patient’s
functional, psychological and physical needs also allows the determination of the distinction between the patients current and, what is perceived to be, their normal bowel pattern. They further outline a number of constipation assessment tools, scales and guides that will provide assistance in evaluating the presence and severity of constipation. Whilst they advocate for patients self-reporting and assessment, they agree that this may not always be possible. Therein they suggest the use of available tools, such as those already cited for example the Bristol Stool Chart and possible alternatives which, whilst similar to those bowel scales already discussed, may be more pertinent in the palliative care environment. Examples of these include The Victoria Bowel Performance Scale (BPS) (see Appendix 5) and the Constipation Assessment Scale (CAS) (see Appendix 6). Molin et al. (2012) explored the validity and reliability of the CAS among 2 groups, 1 group consisted of 35 oncology patients and the other of 73 apparently healthy adults. In this cross sectional study, all subjects were asked to self-rate their constipation using the 8 items on the assessment scale. These questions were answered by indicating 1 for no problem, 2 for some problem and 3 for a severe problem on the rating scale and when summed these scores rated the presence and the intensity of constipation. When analysed, and scores collated, results indicated a significant difference between the median scores of the two groups, with the oncology group scoring 4 whereas the healthy group scored 1. From these findings Molin et al. (2012) suggest that CAS can be effectively used in clinical practice to document the presence of cancer in cancer patients. These scores appear to agree with findings of the original authors of this tool, Mc Millan and Williams (1989), who carried out similar research in 1989 in which they studied 2 groups, one consisted of 32 working adults and another group consisted of cancer patients at risk of constipation. Using correlation analysis, Significant difference was implied, \((t = 6.32, p \text{ less than } 0.0001)\) in the scores among those at risk of constipation who scored 6 times higher than the working adult group. This would appear to provide some further validation of
the use of CAS tool in the assessment of constipation (Molin et al. 2012, Mc Millan and Williams 1989).

In reference to the Bowel Function Index, Ducrotte and Causse (2012) carried out a review of this new patient assessment tool exploring its validity in the assessment of opioid-induced constipation. The Bowel Function Index tool was developed specifically for use among those suffering with this type of constipation. Ducrotte and Causse (2012) suggest this tool is an easy to use scale which is made up of 3 items for assessment, ease of defecation, feeling of incomplete bowel evacuation and personal judgement of constipation. Whilst still in its infancy, Ducrotte and Causse (2012) found that the available data suggests that this tool may be useful in clinical trials and also in daily clinical practice. Ducrotte and Causse (2012) agree that assessment of constipation is essential and the uses of assessment tools are essential in this assessment process to alleviate patient suffering and improve management.

Within their recommendations, The HSE (2013) also suggests the need to undertake a physical examination of the individual, such as abdominal assessment, for signs of constipation. In this the assessor will observe for signs and symptoms such as distension, visible peristalsis, and tenderness in the abdominal area, evidence of impaction and nature of bowel sounds. However, they do report that physical examination, though very useful, is often underused in all health care settings.

The National Institute of Clinical Excellence (NICE) within their guidelines (2007) also recommend the use of digital rectal examination, citing this as an essential component of bowel assessment. NICE (2007) whilst further advises that if intestinal obstruction is suspected, CT scanning and radiological investigation may be necessary to ensure appropriate assessment of care needs. Essentially these guidelines emphasise that a comprehensive
assessment of any patient presenting with symptoms of constipation is paramount, allowing for the determination of the presence and severity of constipation, further facilitating the development of a plan of care directed towards the effective and timely management of this debilitating complaint.

2.2.10 Summary
The purpose of this section was to determine the risk factors associated with constipation. Again, the lack of a unified definition of constipation causes difficulties in classification and subsequently an adequate assessment of the risk of this condition. However many researchers agree that there is sufficient evidence to determine that some populations are more at risk than others. These populations involve the older person, being female, childhood, those with intellectual disabilities, and those people in palliative care services (Kyle 2011, Castledine, 2007, NICE 2007 and Thompson 2005). Additionally Kyle et al. (2011) stress the need for effective assessment, which will facilitate the identification of risk factors for constipation such as underlying medical conditions, current medications, nutritional intake, mobility, toileting facilities and fluid intake. Whilst many authors provided discussion and promotion of the relative merits of the different risk assessment tools, questionnaires and charts currently, they all concur that regardless of the means adopted, adequate assessment is of most importance (Kyle 2011, Castledine, 2007, NICE 2007 and Thompson 2005).

Section 3 Quality of Life
2.3.1 Introduction
Constipation can affect different people in different ways, but in order to fully comprehend how this condition may impact on the life of each person who is experiencing constipation it is important at this stage to offer some indication of how this research might positively contribute to health and social gain.
Whilst implications of the monetary expenditures for both the individual sufferer and the health service as a whole will be explored in detail within section 4 of this chapter, the purpose of this current section is not only to provide an in-depth analysis of how constipation and its related effects may have negative impact on the health and social gain of lives of our older person population in particular, it will also present an appropriate exploration of the notable changing demographics in relation to the population concerned. This is necessary to place into context the need for future development of adequate resources for care provision within this clinical area (An Bord Altranais 2009).

As already suggested, advanced age is a notable risk factor for chronic constipation (Leung et al. 2011). Time and again researchers recount the heightened prevalence of this condition within the population aged over 60 years of age (Castledine et al. 2007, Gallagher & O’Mahony 2009, McCrea et al. 2009, and Chassange et al. 2012). Indeed, Wisten and Messner (2005) argue that constipation is a problem which is seen all too often within geriatric services and within the older person population in general. Tariq (2007) agrees and also suggests that this condition is more common in older people and accounts for increased GP visits and hospital admissions within this population.

Richmond and Devlin (2003) argue that because constipation is largely a preventable problem, healthcare professionals need to be more informed about constipation and its impact on the lives of those who sufferer with this condition. They further stress that due to the embarrassing nature of this condition, it is often under reported, with patients reluctant to discuss this condition and essentially suffering in silence. Therefore, many older people often experience anxiety and depression due to the very nature of this condition, which may lead to social isolation and seclusion from everyday activities of life (Woodward 2012). Peate (2005) in his overview of constipation management in the community also indicate that this
condition may have major psychological effects on the individual sufferer resulting in poor self-esteem and reduced social interaction, therefore allowing negative impact on their quality of life.

2.3.2 Quality of life
The World Health Organisation Quality of Life Group (WHO 1995) suggests that measurement of quality of life should be determined on an individual basis. Although somewhat outdated this does allow to stress the need for focus on each individual's own interpretations of their life and how this relates to each person's own personal values, beliefs and aspirations of life. They argue that quality of life is person-centred and involves all aspects of the person's life, be that, physical, emotional and environmental.

Thompson et al. (2012) highlight that in today's developed society there is a major shift in focus to the exploration and promotion of quality of life. This arises due to the increase in life expectancy and the corresponding number of people living longer with chronic conditions and the subsequent increase in the negative impact of these illnesses on quality of life. Within this domain, Thompson et al. (2012) studied health related quality of life in relation to the older person and stress that the focus of health care should not be only on providing a better understanding of illnesses but also increasing the knowledge base on how best to improve quality of life.

Foxx-Orentein and Gallegos-Orozco (2013) note that constipation is clearly associated with impaired quality of life and psychological distress. Furthermore, Le-Wei et al. (2008) argue that whilst this condition is rarely life threatening it can result in reduced patient comfort and that it adversely affects quality of life. Indeed, Leung et al. (2011) suggest that the negative impact of constipation on health related quality of life is similar to other chronic conditions.
such as osteoarthritis and diabetes, which generally receive more attention from health professionals, and are easier to discuss for the individual.

Within their draft constipation prevention and management guidelines, The Health Service Executive (HSE 2013) reports that all too often the negative effects of constipation are overlooked and underestimated. However, constipation has been known to result in nausea, vomiting, haemorrhoids, anal fissures and bowel obstruction and has also been noted to be an independent cause of delirium, resulting in a condition which may considerably impair quality of life for the individual sufferer. Tariq (2007) previously eluded that whilst constipation might be related to multiple factors; the negative effects of this condition are sometimes overlooked, resulting in inadequate treatment which may result in painful complications, perforation or even death.

Norton (2006) also discusses the direct implication of constipation on quality of life and the older population. In this the author finds that evidence specifically relating to the older person is poor. However, Glia & Lindsberg in Sweden in 1997 used questionnaires to study the general well-being within their population of 102 patients. In this they found that those people with constipation did indeed report a decreased quality of life when compared with those without constipation. These researchers also found that the greater the symptom severity the greater the decrease in quality of life (Glia & Lindsberg 1997). However Norton (2006) reiterates that studies relating to quality of life of those experiencing this condition are sparse, thus arguing that the assessment of quality of life is paramount in the management of any condition, especially within services provided for older persons.

As already noted many researchers refer to the high prevalence of this condition within the older population (Leung et al. 2011, Acalovschi 2012, Chassenge et al. 2012, and Foxx-
Orenstein 2013). Thus, there is a need not only to address this problem in relation to any individual experiencing this condition, but whilst being particularly relevant to the older population, it further underlines the importance to further research into quality of life in those suffering with constipation. In this we may allow for the development of relevant improvement in care provision within this particularly vulnerable population (Garavan & Houghton 2008).

2.3.3 Summary
Constipation has a major impact on the quality of life of those experiencing this condition; unfortunately, it appears that despite this knowledge, many individuals suffer in silence. Thus, social seclusion is not uncommon within those suffering with constipation. Changing demographics predict a significant rise in the number of older people in future populations and with this there is suggestion that there will be an increase in the numbers of those suffering with this condition. Evidence suggests, however, that strategies can be put in place to impact positively on the prevalence and incidence of constipation. An analysis of the overall impact of this condition may allow health service providers to improve both prevention and management approaches in order to enhance the lives of those who suffer with constipation.

Section 4. The Cost of Chronic Constipation
2.4.1 Introduction
Understanding the cost of treatment of constipation is very important to health care, healthcare providers and, of course, to the patient. In this section an evaluation of the costs associated with constipation in relation to monetary expenditure and its impact on health and social gain will be provided. Management of this condition is expensive and accounts for an increase in the use of the health services with a high proportion of the budget being spent on over the counter medications and laxatives (Tariq 2007). The lack of a unified definition of
constipation, it subjective nature and the subsequent lack of understanding of this condition lead to challenges in providing adequate services. This evidence based review and exploration of the relevant literature will allow for an understanding of these disparities, therefore enabling for the provision of improved management of this condition, consequently improving patient care.

2.4.2 The Cost of Chronic Constipation
Lederle (1995) found that in the United Kingdom constipation accounted for 2.5million GP visits annually and 92,000 hospital admissions, yielding a cost of prescriptions at that time of £43,000. Whilst older persons are usually satisfied with their laxatives as long as they are effective, cost can be a major concern (Annells & Koch 2002). Interestingly, Petticrew et al. (1999) in a systematic review of the use of laxatives for the treatment of constipation in the older person, found that in nursing homes on average 59% to 78% of residents used laxatives at some time. Furthermore, Tariq (2007) notes that in 2000, the Department of Health UK spent £46million on the 4 main laxatives (bulking agents, osmotic, stool softeners and stimulants). Little seems to have changed as Woodward (2012) reports from July 2006 to July 2007 almost 14 million National Health Service prescriptions for laxatives were issued to people. Furthermore, in England the cost of constipation treatment was estimated at 60 million pounds sterling (2007 prices) (Woodward 2012).

Pekmezaris (2002) in his research study based in New York suggests that the average cost of nursing interactions for the treatment of constipation was $2.11million annually. Furthermore, from the UK Norton (2006) suggests that community nurses spend approximately 10% of their time with patients suffering with constipation. Goodman et al. (2005) further add that these figures are equivalent to spending half a day a week and at least 5.5% of nurse’s out-of-hour calls relating to patients with constipation. These figures may be
an underestimate as cases of this condition are often identified during planned visits and during other community nurse visits wherein costs have not been evaluated. Schmeir & Kleinman (2002) studied 102 residents in 59 nursing homes in the United States and measured the costs of overall nursing care for constipation. In this they divided costs into (1) measurements of actual time to complete all care and (2) cost of nursing interventions. Their findings note figures of $2253 US dollars annually per long term patient of which of $1577 was attributed to the actual cost of nursing care.

There appears to be little evidence of studies of costs related to treatment of constipation from an Irish perspective. However, in one Irish study of overall drug prescribing, Ryan et al. (2008) found that 6.8% of all medicine prescribed in this country was for gastrointestinal conditions. This study does not relate to the cost of this treatment and provides for the need of further research in this area.

Within their draft guidelines of constipation in palliative care services, The Health Service Executive (HSE 2013) do not document the cost of the treatment of constipation, they do however stress that costing of this type of care is difficult to quantify. Indeed, due to the nature of this condition and the prevalence of opioid induced constipation in palliative care the estimates are most likely to be higher than in general health care services. Indeed, Wee et al. (2010) found that the direct cost of this treatment was in the region of €1525 per month overall. These figures are significantly higher than those of people suffering with mild or moderate constipation, in which figures are estimated at €1196 and €1088 respectively.

2.4.3 Summary
The costs in relation to constipation are difficult to assess. Many sufferers, especially within the older population, tend to self-manage. Furthermore, most, if not all treatments are
available over the counter, therein the real cost of this condition often goes unseen. The first line of treatment and management involves lifestyle modification, increased food and fluid intake and an increase in nursing interaction, i.e. increased toileting regimes, documentation of frequency etc. Whilst some studies of these hidden costs have been carried out (Pekmezaris et al. 2002, Frank et al. 2002), there appears to be a dearth in the evidence based literature and a need for more detailed analysis of this cost therein outlining the comparative costs of these interventions and medication. Grainger (2007) stress that whilst the cost of this condition may be assessed in monetary terms, it is however, important to consider the non-tangible costs associated with constipation, such as the impact on health related quality of life.

Section 5 Current management of constipation

2.5.1 Introduction

A holistic approach to care planning and the development of an effective prevention and management strategy will not only improve care but will also have a positive impact upon the quality of life of those suffering from constipation (Roa et al. 2010, Kyle 2011, Boyle 2013, and European Union Geriatric Medicine Society (2013). Indeed, HIQA (2009) emphasise that care of older person in the long-term care settings should be individual, involving a multi-disciplinary approach in the continuous management of bowel function rather than focussing just on the treatment of constipation.

This section will explore the current management of constipation. Whilst discussing management in relation to all populations, particular attention will be paid to the current strategies in relation to the older person population. This review of the literature will highlight any need for improvement in management and allow for the opportunity to provide discussion of how these care needs may be met.
2.5.2 Management
Management of any health care need always requires person centred, holistic approach (Watts et al. 2013). Care planning and delivery should involve the multi-disciplinary team, providing medication management, care regimes, patient education, health promotion and therapies from an all-inclusive perspective. Such an approach will allow for a reduction in any barriers associated with the initial management strategies and promotion of enhanced adherence to the care plan.

2.5.3 Non-Pharmacological Treatments
Clarke et al. (2013) reiterates that management of constipation is often hindered by the lack of definition and diagnostic criteria, which serves to hamper the advancement of the assessment and diagnosis. However, initial management should involve patient education (Wald et al. 2013). In normal, slow transit constipation, behaviour modification and dietary changes including an increase in fluid intake may be all that is needed to relieve and manage symptoms. However, Boyle (2013) adds that fluids need to be varied, whilst water is almost always available, it may help to introduce juices and probiotic drinks, which contain live organisms (mostly bacteria) which are suggested by the World Health Organisation (WHO 2011) to improve the symptoms of constipation. Alcolovschi (2012) further explains that probiotic are made up of a short chain of carbohydrates and are useful to patients with constipation, not only for that osmotic effect but for their ‘good bacteria’. These preparations help to reduce colon transit time. Thus, symptoms often respond well to these methods, and it is suggested that nurses are more likely to initially utilise non pharmacological management approaches (Woodward 2012). However, Chister et al. (2003) warns that the use of non-pharmacological methods will depend on the severity and duration of constipation and
Consideration of other treatment modalities may need to be considered if there is no response using non pharmalogical treatments.

Peate (2005) suggests that once the initial diagnosis is obtained, the health care provider should be in a position to provide the patient with a precise, person centred plan of care and as such there are several publications to guide constipation management. Peate (2005) recommends the Reckitt & Benckiser constipation management guideline (2004) (see Appendix 8). This guideline addresses both acute and chronic constipation, and allows for the assessment of known causes and risk factors and also provides an overview of treatment options. Within this guideline the authors (Reckitt & Benckiser 2004) suggest treatment options such as increasing fluid, fibre intake, lifestyle changes and/or the use of a variety of available laxatives, Their guidance on management outline the need for a medication review every 6 to 12 months and at this review, the assessor should reconsider the underlying causes of constipation presented by the patient. A review of the efficacy, concordance and side effects of treatments should also be undertaken at this time, herein assessing the suitability of these treatments and their long term use, evaluating and documenting the results of these treatments in addition to the impact of nursing interventions. Although this guideline does appear to be robust, allowing effective guidance of this condition unfortunately it does appear to be somewhat outdated given that it was developed in 2004. A search of the relevant literature to retrieve updates on these guidelines found no evidence of same and little evidence is provided to support the individual recommendations within.

Castledine et al. (2007) remind us that there is general acceptance that there are many psychological, physiological, pathophysiological, social and environmental causes associated with constipation and in that any management strategy needs to consider not only the constipation itself, but also but these underlying causes and conditions. Indeed, more
recently McKay et al. (2012) in their evidence based review of constipation management suggest the need to determine those at risk of constipation, for example, using the table of selected diseases and conditions known to be associated with constipation (see Appendix 8). Indeed, they believe when used in combination with the bowel function diary (see Appendix 10) this approach will determine the presence of the condition and provides guidance on the management of the condition.

Svedas & Wise (2012) outline their management strategy wherein patients from within a 30 bed dementia specific unit were asked to keep their own constipation diary, this log, along with information from the patients’ medical charts noting weight, fluid intake and medications were captured by nursing staff. This approach provided information on the patients’ perceptions of their constipation, effectively allowing more patient input and also acting as an education tool. In addition, the approach empowered the patient and allowed capturing of information on the presence, type and severity of constipation. Carried out over a 12 month period this strategy also involved using an approach whereby there was an increase in assisted toileting regimes. After the 12 months study period, findings indicated a significant reduction in laxative use, wherein the use of suppositories decreased from 130 to 20 per month. Feedback from staff indicated that they could see recognised benefits to the patients' quality of life and enhanced preservation of patient dignity. Svedas & Wise (2012) did suggest however, that there is a need for effective resources in the implementation of these regimes. This would necessitate good leadership, support from the organisational level and involvement of all staff in a systematic review of current practice. Whilst there does appear to be some strength within this study the fact that the research was carried out in a dementia specific unit, along with the omission of actual numbers of participation provides doubt of the validity and reliability of this study.
Another management strategy involves increasing intake of dietary fibre (Chister et al. 2003, Peate 2005, Kyle 2011, Boyle 2012, Woodward 2012, and HSE 2013). When the food that is consumed is digested in the stomach, fibre passes through to the colon where it draws on fluids making stools softer, larger and easier to pass (Chister et al. 2003). Whilst health related guidelines (HSE 2013) suggest a daily fibre intake of 18g is sufficient, it is argued that in any primary care setting fibre intake should be increases to 30g daily (Woodward 2012). This, with an increase in exercise and general mobility, may often prove a simple but effectual management and treatment of constipation. However there is conflicting evidence in relation to this management strategy. Muller-Listner et al. (2000) in their evidence based review of the myths and misconceptions of chronic constipation believe that there is no evidence that stool consistency and constipation can be affected by an increase in fluid and fibre intake. These authors refer to a study carried out by Young et al (1998) in which 108 constipated children (aged 2-12yrs) were given an increase in fluid intake of 50% for a period of one week, and results yielded no changes in stool consistency (assessed by appearance), nor any increased ease in defecation. Thus, Muller-Lissner et al. (2000) believe that there is no substantial evidence in relation to increased mobility in the relief of constipation. Conversely, Chister et al. (2002) argue that any increase in exercise will help to aid peristalsis (the wave-like muscular movement of the digestive system).

This aids the movement of stool through the bowel for defecation. Tariq (2007) concurs that whereas there is a lack of convincing data, however, any increase in exercise, in tandem with increased fibre intake, although not adequately proven to alter constipation, has been shown to be associated with improvement of overall well-being.

A study carried out by Hull et al. (1990) of 92 nursing home patients explored laxative practice in patients within chronic constipation, in this they found that use of a supplement of
Fifer 7, a natural powder fibre (7 grams per meal twice a day), enabled discontinuation of laxative use in 63 of the 92 patients. Furthermore, the use of laxatives was virtually eliminated in the year following initiation of the program at this Centre, reporting a saving of $44,000 in expenditure on laxative drugs. A further study by Wisten & Messner (2005) explored how a fibre rich porridge (Pajala Porridge) might increase bowel movement in secondary geriatric wards. The control group (10 patients) were given standard breakfast, the intervention group also made up of ten patients, were given fibre rich porridge for 1 week. Results indicated a notable increase in bowel movement within the intervention group, 76% compared with 23% in the control group. The authors conclude that high fibre meals should be included in management strategies for constipation. However, they acknowledge that it may be difficult to encourage patients, especially in the older person population with poor appetite, to try new food stuffs.

In their report of non-pharmacological approaches to management of constipation, the HSE (2013) suggests that all intervention must be led by a clear understanding of the patient’s clinical status. With the main objective being to re-establish patient comfort, alleviate pain and suffering and essentially avoiding any further complications. Whilst they advocate lifestyle modification treatments they also suggest other treatments such as abdominal massage. Indeed in a recent study of 60 patients with constipation and dependant on laxatives, Lamas et al. (2010) divided these people evenly into a control group and an intervention group. Both groups continued to take their laxatives for the 8 week trial period but the intervention group were given 15 minutes of abdominal massage five days a week. The results of this study showed a significant decrease in constipation and abdominal pain in the intervention group compared to those in the control group. There does appear to be strength in this study, given the sufficient eight week intervention period and the adequately sized population. Further research by these authors into the cost analysis of this therapy also
found that this was a cost effective treatment long term for constipation. Whilst, the results are reported to imply a statistically significant decrease in constipation between the control group and the intervention group, unfortunately these authors do not highlight numerical significance.

Abdominal massage is also becoming a very popular way of treating constipation in a non-pharmacological way. This therapy is discussed by Lamas et al. (2010) and appears to work well. This involves the massaging of the abdominal area, following the line of the bowel and the flow of faecal matter in clockwise circular movements starting at the ascending colon and finishing at the sigmoid colon.

A further recommendation relates to the optimising of toileting, wherein the overall environment of toileting should be reviewed. This toileting area should provide privacy and comfort in which the patient might be encouraged to sit in the most effective position to allow the opening of the bowels. If possible be encouraged to raise their feet from the ground (possibly with their feet stable on a small stool, whilst they lean forward with their hands on their knees) This will not only provide comfort and stability but will effect natural propulsion of stool through the rectum into the anal area (HSE 2013). However, we are relating to palliative care patients this may not be achievable most especially as illness progresses and these patients become frail or infirm.

Leung et al. (2011) discusses the role of biofeedback in relation to Pelvic Floor Dysfunction (PFD). Biofeedback involves the retraining of the sensation of control of the anorectum and pelvic floor, thereby enabling these patients to regain control of the necessary contractions required for normal defecation. This is a painless, non –evasive procedure which is normally used to treat patients with dysynergic constipation. This type of constipation, already
discussed in chapter 2.2, is related to the inability to coordinate abdominal and pelvic floor muscles to evacuate stools. Essentially this biofeedback involves cognitively retraining the pelvic floor and the abdominal wall muscles. Patients are taught to regain control of these muscles by means of both cognitive behaviour therapies and when necessary surface electrodes and anal plug and abdominal wall surface electrodes may be used to stimulate these muscles in an effort to allow the patient to regain control of their bowel function. Heyman et al. (2007) in their randomised control trial to determine the efficiency of biofeedback versus placebo studied a group of 84 patients with dysynergic constipation. Of the 84 patients, 30 of these were treated with biofeedback, 30 were given diazepam and the remaining 24 were given placebo. All of the patients were trained to use pelvic floor exercises in 6 bi-weekly training sessions but only those in the biofeedback group were given electrode therapy. Results of this study found that after the six weeks biofeedback was superior to both diazepam and placebo with figures of 70% versus 23% respectively. Three months after the trial biofeedback patients still reported adequate relief of constipation. This does appear to be a strong trial, the only notable limitation is that patients who suffered with severe slow transit constipation were also involved in this trial and the researchers concur that this therapy may have little or no effect on this type of constipation. Whilst the value of this treatment has been shown in this trial, researchers do suggest caution in the use of this therapy. Roa et al. (2010) suggest that biofeedback should be considered particularly for patients with pelvic floor dysfunction, they add that further trials are needs to establish the efficacy in older adults wherein a proper assessment would be necessary to establish physical and mental capacity of this patient to establish the potential of this therapy. Chiarioni et al. (2005) concur and further suggest that biofeedback benefits only patients with outlet dysfunction (dysynergic constipation), not patients with isolated slow transit constipation.
Schnelle et al. (2009) evaluated whether other behavioural interventions would improve constipation and faecal incontinence in nursing home residents. Of 111 patients offered toilet assistance every 2 hours for 2 days, 68% showed immediate improvement of rates of bowel motion. Although it must be noted other symptoms of constipation did remain in a subset of these patients. In fact, this study did appear to have further limitations as records of bowel movements and consistency were only available in 2 of the nursing homes. The other nursing homes recorded frequency over a longer period which may have obscured the specific time periods that the bowel movements were recorded to occur due to the need for increased allocation of time, where the average continent bowel movement took longer than 7 minutes for some residents, it may be suggested that this is not a cost effective intervention. However, due to the unknown effects and expense of long-term laxative, further research into the use of toileting assistance without the use of laxative would be of importance, especially given the negative effect of constipation on quality of life.

2.5.4 Summary
In this section the author has provided a clear and inclusive review of the evidence based literature in relation to the non-pharmacological approach to the management of constipation. Whilst once again findings relate that management is all too often hindered by the lack of unified definition and diagnostic criteria relative to this condition, it does highlight that in itself constipation is subjective. Any management strategy must be person centred. This approach may involve the trilogy of life style modifications, such as dietary changes, increased fluid intake or increase in mobility/exercise. It may be treated by abdominal massage, biofeedback, a review of existing medication or the need to improve available toileting facilities, allowing for more privacy, dignity and time to allow adequate toileting. These treatments have all been researched and for some appear to work, however when all of these interventions are tried and fail the use of pharmacological treatments may be necessary.
in order to provide the necessary care, to alleviate, pain and suffering and maintain quality of life, laxatives must be considered.

2.5.5 The Pharmacological approach

2.5.5.1 Bulk Forming agents
NICE (2009) while suggesting that the first step in management of constipation must relate to lifestyle changes outline that this approach may not always effective. In their guidance they suggest that a short course of laxatives may relieve constipation and restore normal bowel functioning. However, they stress that long term use of laxatives should be avoided. Castledine et al. (2007) concur but highlight that laxatives are the most common form of treatment for constipation. Whilst they agree that in general their usage should be a short term remedy, unfortunately, it is common for dependence to develop. However, in certain groups, for example, patients with spinal cord injuries, laxatives are needed to prevent and treat any symptoms of constipation.

One of the main categories of laxatives is bulk forming agents (Peate 2005). Bulking involves the increase in fibre which results in an increase of water absorption and the formation of larger, softer stools allowing for ease of defecation. These agents use natural ingredients such as bran, ispaghula husk, psyllium and methylcellulose, (a chemical compound derived from cellulose).

Although Wald et al. (2013) believe that these agents, when taken with adequate fluids may improve bowel habits in many patients, they also suggest that an increase intake of natural agents such as prunes or plums have also seen to be as effective. Indeed, in a cross-over clinical trial of 40 patients with chronic constipation, participants were given either prunes or psyllium for three weeks. The outcomes of the trial noted that those who had received prunes reported more spontaneous and complete bowel motions than those taking psyllium (Mean
3.5 v 28 per week) (Attaluri et al. 2011). This appears an effective trial. Three weeks would be suggested as adequate time to study notable effects on bowel function, although results do indicate the need for further research as to the use of this natural and palatable food stuff versus laxatives.

In their extensive descriptive study of 90 older people (65+) in living in community settings in Australia, Annells & Koch (2002) allowed semi-structured interviews to explore the experiences and responses to constipation and the ‘laxative mire’ in seeking solution to this condition. Their findings revealed that of those individuals when asked to recommend a laxative for another sufferer, most choose senna as number one, followed by magnesium sulphate and then lactulose. Whilst specific numbers are not reported, these researchers relate that some participants report dissatisfaction with psyllium as a bulk-forming laxative; therefore, health care professionals should carefully consider the requirement to prescribe or recommend this as a first line treatment. However, The World Gastroenterology Organisation (WGO) (2007) reports that bulk-forming laxatives are, on the whole, safe and useful in the treatment of constipation. Furthermore, Kyle (2007) suggests that bulk forming agents are the least harmful of these pharmacological treatments and can be best used with lifestyle advice and an increase in fluid intake.

### 2.5.5.2 Stimulant Laxatives

Peate (2005) defines stimulant laxatives as agents which increase intestinal motility by stimulating colonic nerves. This causes fluid retention within the colon; however, he further adds that effect may take up to eight to ten hours. Prolonged use is not advised due to the potential to cause cancer (WGO 2007). Leung et al. (2011) suggests that Senna and Bisacodyl are the most commonly used agents to aid peristalsis contractions and decrease the water absorption from the lumen (Intestines) therefore allowing the formation of moister and
easier defecated stools. Senna is a natural plant (an anthranoid laxative) and when taken is activated in the large bowel and may result in discolouration of urine due to metabolic excretion (Kyle 2007). Bisacodyl based stimulants can also be administered in suppository form and will take effect in 15-60 minutes. Danton is another agent that may be used to stimulate peristalsis, however is only licensed for use in the palliative care environment, for terminally ill patients. This is because studies of rodents found that this ingredient, if used in high doses, was highly carcinogenic (Kyle 2007).

Boyle (2013) reports that these stimulants are seen to be very effective, however, they should only be used on a short term basis, no longer than a week, as chronic long-term use of these agents is associated with loss of colon function. Furthermore, the Joint Formulary Committee (JFC 2012) purports that these stimulants have been known to cause electrolyte imbalance and/or abdominal cramps in some patients. The WGO (2007) also highlight that diabetics should avoid stimulant laxatives such as senna and Bisacodyl since their metabolites may influence blood glucose levels, especially in patients with brittle type 1 diabetes.

Kienzle-Horn et al. (2006) in their double blind randomised study Bisacodyl over placebo studies 55 patients (aged 19-98 yrs) presenting with idiopathic constipation within 8 primary care practices. The first group of 27 patients were given bisacodyl (10mg) per day for three days, whilst the second group were given placebo for the same duration. Results found that Bisacodyl based stimulants were safer and most effective than placebo and whilst the mean number of stools were significantly greater in laxative use they were also softer, well-formed and allowed ease of defecation. However there is notable weakness in this study in that the population appears small with numbers in comparable studies approx 200. It is also noted that this study was carried out over a notably short period of time (3days) Allowing that the constipated may go for much longer periods of time without effective defecation, other comparable studies would be carried out over a number of weeks to allow for strength in
findings. Despite the wide spread use of senna for over a century, Luerg et al. (2011) in their
evidence based review found no trials comparing senna over a placebo. However there are
RCTs of senna versus other laxatives but these studies appear outdated (circa 1980’s).
Fosnes et al. (2011) carried out a cross sectional study to assess the effectiveness of laxative
therapy in an everyday setting in Norwegian nursing homes. This study involves 197
residents who required laxatives regularly or on demand and had been in the nursing home
for more than 7 weeks. Those with irritable bowel syndrome (IBS) or other bowel disorders
other than constipation were not included. The use and dosage of laxatives were recorded and
normal defecation was defined as that of more than 3 defecations a week. The mean age of
participations was 85.6 years of age. The uses of all laxative groups were involved.

Whilst results showed that normalisation of stool frequency was achieved in 116 patients, it
did allow that even with this laxative us, 81 patients did not achieve this. In fact all subjects
were still experiencing frequent and bothersome symptoms such as straining, feeling of
incomplete bowel motion and anorectal obstruction.

This did appear to be strength in this study as it was a real life study. However the researchers
would admit that it was somewhat limited in that results were difficult to compare due to
unsatisfactory definition and varied responses. Overall the researchers suggest that treatment
of constipation in nursing homes was unsatisfactory and independent of treatment regimes.
The laxatives involved in this study were psyllium, lactulose, liquid paraffin, senna, macragol
combinations, docusate, sodium sulphate and bisacodyl. In further relation to the use of these
laxatives these researchers also highlight a systematic review of selected studies carried out
by Ford et al. (2011) wherein these researchers selected studies of placebo controlled trials of
these laxatives and pharmacological therapies in relation to chronic idiopathic constipation
and found that of the 21 eligible trials all of these laxatives were found to be superior to
placebo.
2.5.5.3 Summary
In this chapter evidence suggests that stimulant laxatives appear to be a safe and effective treatment for constipation. Most of the evidence suggests that these laxatives are associated with improved bowel frequency, consistency and ease of stool evacuation. However many of these researchers also suggest that these stimulants should be used with caution as they may cause electrolyte imbalance and long term use has been associated with cancer (Kyle 2007 & Leung et al. 2011).

2.5.6 Osmotics
Annells& Koch (2002) suggest that osmotic laxatives are the most commonly used and the most often prescribed by doctors. In their study of residents in a long term nursing home in Helsinki they found that osmotic laxatives were used in 48% of participants while 14.3% used stimulants. Osmotic laxatives work by retaining fluid in the bowel through a process known as osmosis, this, in turn, changes the water distribution in the faeces, however, Rao et al. (2010) highlights that because Osmotics affect water distribution a good fluid intake is important.

Osmotic laxatives include polyethylene, glycols and non-absorbable sugars such as lactulose and sorbitol. Polyethylene and glycol (PEG) contains poorly absorbed molecules, which with the effect of osmosis, leads to water being retained in the intestines. Adverse effects of this laxative include electrolyte disturbances and diarrhoea. These osmotic laxatives also include magnesium salts, and saline salts, therefore, these laxatives should not be prescribed for patients with a history of renal, liver or heart complications (Tariq 2007).
Polyethylene glycols are said to be effective in those patients with chronic constipation and faecal impaction and should only be used if the patient is not responding to bulk agents (Peate 2005, Wald 2010). Low-dose polyethylene (17g/day) appears to have good effect and is well tolerated in older patients with chronic constipation. However, higher doses may cause bloating, cramping and flatulence (Wald2010). In the USA, polyethylene, lactulose and milk of magnesia are Food and Drug Administration (FDA) approved as osmotic laxatives for the treatment of occasional constipation (Ho et al. (2008).

Lee-Robichaud et al. (2010) in their comparative study of low dose polyethylene glycol electrolyte solution and with lactulose for treatment of chronic constipation found that the formula adequately increased stool frequency, reduced the need for other laxatives, and had a positive impact on the symptoms of constipation in this older person population. Volicer et al. (2005) conducted a prospective observational quality improvement study of 41 nursing home residents with chronic constipation and receiving an osmotic laxative. In this study Sorbitol was substituted for lactulose. They found there was no difference in efficacy of lactulose and sorbitol. Kyle (2007) suggests that these osmotic laxatives may take 2-3 days to take effect therefore are not suitable for the rapid relief of constipation; this conclusion is also supported by the National Prescribing Centre (2004). If the preparation is mixed with water and consumed it has the effect of osmotic action which triggers receptor stimulation leading to increased colonic stimulation. Movicol contains electrolytes that are at the same concentration as faecal fluid therefore there is virtually no loss in electrolyte stability. These laxatives are easy to prepare, do not have to be consumed all at once, thus can be sipped over time. Therefore are deemed a suitable laxative for older person people and those in palliative care. The American College of Gastroenterology Chronic Constipation Task Farce (2005) found evidence that polyethylene glycol improved stool frequency and efficiency. They report that this laxative should only need to be taken once a day, with a starting dose of 17g
sachet in 8oz of water. They do relate however that a stimulant laxative may be added every other or third day to have good effect.

2.5.6.1 Summary
Overall osmotic agents have been demonstrated to be efficacious and well tolerated in patients with constipation. Findings suggest that they have good effect. They are suggested to be the most commonly prescribed laxative; however it is also reported that they are often used as prevention rather than a treatment of this condition. Whilst these laxatives are deemed safe for use within palliative care, however, as mentioned previously, caution is advised. Indeed, high doses may cause bloating, cramping and flatulence.

2.5.7 Faecal softeners
Stool softening laxatives are preparations used for prevention more so than treatment and these formulations can take from 24-48 hours to take effect (Boyle 2013). Whilst they are safe and tolerated well, they are known to cause absorption of vitamin K and so should not be used by those patients on blood thinning agents (Boyle 2013). These laxatives work by softening the stool (Peate2005), and have been known to cause irritations and leakage and for these reasons their use is often discouraged. Indeed, some suggest that these preparations are no longer recommended for the treatment of constipation (Bossard et al. 2004, Woodward 2012). Stool softener preparations are most commonly made up of Docusate Sodium which has weak stimulant properties (Kyle 2007). Other softeners are made up of liquid paraffin and have been known to cause seepage, irritations and in some instances lipid pneumonia (although rarely) and therefore are not recommended for clinical practice (Bharucha 2004, Kyle 2007). Indeed, The College of Gastroenterology Chronic Constipation Taskforce (2005) argues that these agents may actually have fewer side effects than some, but the consensus is
that these stool softeners are inferior to bulking agents, such as psyllium, in improvement of stool frequency.

Stool softeners are commonly prescribed however, they have been shown to be relatively ineffective. McRorie et al. (1998) explored the use of docusate Sodium for treatment of constipation in a comparative study of this preparation versus psyllium (stimulant laxative). This involved a multi-sized, randomised, double blind parallel study of 170 patients with idiopathic chronic constipation; in this subjects were given psyllium or Docusate for a two week period. From this the authors found psyllium to be superior to Docusate Sodium for softening stools by increasing stool water content and allowing for greater and more frequent bowel movements. In general psyllium had a greater overall laxative efficacy in subjects with chronic idiopathic constipation. Whilst this study found strength in the multi-sized subject population, 2 weeks may be seen to be too short a period of time to adequately assess effective bowel activity. Perticrew et al. (1999) in their systematic review of randomised control studies (RCT’S) of the efficacy of laxatives in older person patients found that despite the frequent use of laxatives it remained unclear which of these drugs were most effective for this population. They did find however that there was a trend towards the prescribing of the more expensive laxative, calling for more research and recommendations of the ‘best buy for constipation’ for this most vulnerable group.

2.5.7.1 Summary

Faecal softeners as a laxative are suggested to be used as prevention to constipation rather than a treatment. Whilst many researchers relate that these laxatives have been known to cause seepage, irritations and even in some cases lipoid pneumonia, they are rarely recommended within clinical practice.
2.5.8 Lesser Used Treatments
Although these aforementioned four groups of laxatives are cited throughout the literature as the most commonly used laxatives Many authors also indicate the use of Enema, Prokinetic Agents and Chloride channel blockers for both primary and secondary constipation (Chassenge et al. 2012, Roa et al. 2010,Tariq 2007).

Enema is a procedure in which liquids are introduced into the rectum and colon via the rectum. Increasing the volume of liquid in the intestines causes expansion within the lower intestinal tract resulting in a feeling of urgency to empty the bowel. These enemas are said to be very effective as the results are immediate however patients do report much discomfort, bloating, cramping and powerful peristalsis therefore this therapy is only usually used in the treatment of acute cases of constipation and must be used with caution due to risk of perforation. These enemas are most open made up of small volumes of warm tap water, but whilst those containing phosphate may be used, these are rare as they can cause electrolyte disturbances (Wald2010).

Prokinetics are not laxatives they are a 5HT4 antagonist which acts by stimulating contraction and coordination of the gut. These drugs (usually Prucalopride and Tegaserod) are sometimes used to treat long term constipation but normally only used as a treatment for constipation which has not responded to first line treatment laxatives (Woodward 2012). However, whilst these drugs are available in Canada and Europe they are not available in The United States. They were FDA approved in 2002 for use in these USA for the treatment of constipation-predominant irritable bowel syndrome and later in 2004 for idiopathic chronic in patients over 65 years. However, in 2007 this drug was withdrawn from the market due to associated risk with cardiovascular conditions. Despite this, Ho et al. (2008) and Chassenge
*et al.* (2012) argue that Prokinetics have been shown to offer effective treatment in those for whom other laxatives have failed.

**Chloride Channel Activators** work by activating the secretions in the intestines, which subsequently increase gut motility and the passage of stools through the bowel. Lubiprostone (generic name) was approved in the USA by the FDA for the long term treatment of constipation. In randomised control trials carried out by Roa *et al.* (2010) Lubiprostone improved straining instances and consistency and frequency of bowel motions. However the long term risks and benefits of this treatment remain to be determined (Roa *et al.* 2010).

### 2.6 Chapter Summary

Annells & Koch (2002) suggest that people seeking treatment for their constipation are really looking for a solution. While they will eventually seek treatment from their doctor or health care adviser this is normally after other sources and solutions have been investigated. While the first line of treatment will most often involve the trilogy of diet, fluids and exercise, unfortunately they are not always effective. Many researchers would suggest that laxatives are a far too commonly used treatment for constipation (Annells & Koch 2002, Kyle 2007, Ho *et al.* 2008, Woodward (2012). However, more often than not they are often a necessity, if only as a short-term measure to alleviate symptoms until thorough investigations and management and treatment options are adequately discussed (Castledine *et al.* 2007). Tariq (2007) stresses that the effects of constipation should never be underestimated and laxatives may often be necessary in order to alleviate the pain, suffering and impact on the quality of life of the sufferer.

Within the palliative care environment the HSE (2013) report that laxatives are most often a necessary and effective treatment of this condition and will often remain in use as other
treatments may not often be an alternative. However, Chister et al. (2003) whilst in concurrence stresses that laxatives only deal with the symptoms and not the cause; therefore he argues that laxative use should be short term. Kyle (2007) argues further that on the long term it is of most importance that the treatment of constipation, as in any condition, be done on an individual basis defining symptoms, assessment and effective management is the cornerstone of any care planning. This is of utmost importance in this most vulnerable population of which figures of prevalence of this condition are high and in that, deemed to be on the increase (Castledine et al. 2007). In that, therefore whether it necessitates the use of lifestyle modifications, non-pharmalogical intervention or laxatives, if this allows to alleviate the pain and suffering of the patient experiencing this condition then it is our duty of care to be aware of such treatment modalities and to apply them appropriately, allowing for any necessary modification along the continuum of care (An Bord Altranais 2002).

Chassenge et al. (2012) consider this condition to be a major burden amongst the older population and further highlight that data on efficiency, safety and costs of real life applicable interventions, in particular lifestyle modifications remain limited. Throughout the literature the heightened prevalence of this condition with the older person population is noted. Therefore, polypharmacy, co-morbidities and age related changes need to be taken in account in any management and treatment regime in relation to this population Laxatives are readily available and most will have timely effect, however research indicates that these drugs should not be prescribed long term as they may have adverse effects, these include cramping, haemorrhoids, fissures, skin irritations and not least loss of independent bowel function. These drugs are most widely used in long term residential services amongst the older person. The relative costs and effectiveness of these treatments needs further assessment, not only from a cost perspective but most importantly from in relation to adequate management and treatment. There are other non-pharmacological treatments available, such as Prokinetics and
chloride channel activators but the risks and benefits and overall costs of these treatments remain inconclusive, necessitating further research. Constipation is a common, difficult and expensive condition to treat, most especially in advanced stage, this warrants further investigation on this treatment and management and the necessary fulfilment of care regimes that are both adequate and cost effective.

2.7 Conclusion

The lack of a clear and unified definition is evidently affecting diagnosis, treatment and management of this condition. Changing demographics and the increase in the number of older people in the years ahead will provide added pressure on health services and our overall economy. Therein lies a gap and this research set out to bridge this gap through the following aims:

1. To determine the prevalence of constipation in an Irish NH population by the Rome III Criteria.
2. To assess the use of laxatives among the study population.
3. To determine local policy in management of constipation in the nursing home population
4. To conduct a micro cost analysis of current treatment of chronic constipation in the Irish nursing homes.
Chapter 3: Methods
Chapter 3: Methodology

3.1 Introduction
Clinical research is an essential element in the drive for evidence based practice (Parahoo 2006). However, the delivery of high quality research is not always easy, thus the mainstay of any quality research lies in the planning (Polgar and Thomas 2008). This planning process involves a comprehensive recognition of the methodological underpinnings of the entire research process, therein allowing choice of the correct research design to answer specific questions. Such steps will ultimately lead to the presentation and dissemination of research findings which are transparent and easily understood (Cresswell 2014). Indeed Polgar and Thomas (2008) suggest that the usefulness of any research depends on the appropriateness of the selected research design. Furthermore, in choosing the correct methodology the researcher must take into consideration previous research evidence. This evidence will provide the background which influences the collection and subsequent analysis of the information collated.

This chapter will present an exploration of the methodological issues relating to the writer’s clinical research project. An outline of the objectives of the research will facilitate the necessary discussion of the study purpose and provide to demonstrate how the methodological underpinnings of the research process allowed for the selection of the correct design to answer the research question. Thus this chapter provides an outline of the research objectives, the sampling, sampling size, sampling approach and data collection methods. The data collection tool is also reviewed in detail and is followed by discussion of validity, reliability, data analysis and potential utilisation of the research findings. Finally ethical considerations are addressed and this is followed by a summary and conclusion.
3.2 Research Question
The research question for this study was: “What is the prevalence of constipation in a NH population in Ireland?”

3.3 Study Aims
The aims of this study were to:

1. Determine the prevalence of constipation in an NH population in Ireland using the Rome III Criteria.
2. Assess the use of laxatives among the study participants
3. Determine local policy in management of constipation among the study population
4. Conduct a micro cost analysis of the current treatment of chronic constipation among the study participants.

3.4 Research Paradigms
Nursing research is mostly carried out within two broad paradigms. These paradigms represent the general perception of the complexities of the world (Polit & Beck 2006). In reference to these paradigms, Ellis (2010) suggests that they are a way in which one might look at natural phenomena whilst allowing incorporation of a set of philosophical assumptions which influence and somewhat guide the study approach. Regarding the social sciences Polit and Beck (2014) refer to two approaches which the researcher might take, these are quantitative or qualitative.

A qualitative research approach allows enquiry of matters of human experience by studying them directly (Cresswell 2014). Also referred to as the naturalist approach, this research uses methods traditionally associated with the humanities and involves the researcher gathering, analysing and interpreting data by observing what each participant says and does (Parahoo 2006). In essence this approach allows for the gaining understanding of each participant’s every day experiences whilst successfully capturing a sense of the individual within (Polit
and Beck 2006, Creswell 2008). Therein, studies are classified as qualitative if the purpose is to provide a subjective, historical description of a phenomenon. This approach is said to be a multi-method approach which utilises a diverse set of techniques (Cresswell 2014). It is said to be underpinned by the paradigm of interpretation, that is, a school of thought which believes that the world is constructed around human nature and involves how we make sense or interpret the world around us (Polit and Hungler 1999). The flexible nature of this approach allows for differing of one qualitative study to another (Parahoo 2006). As such, qualitative research allows for a use of a variety of techniques which are often difficult to generalise from (Parahoo 2006). This lack of generalisability, though not the main objective in use of this approach, is, often however, a criticism of this research approach (Walker 2005).

3.5 Quantitative research
Quantitative research on the other hand is a more formal scientific method. This approach has its underpinnings in the philosophical paradigm for human inquiry, known as positivism (Polit & Hungler 1999). Quantitative research is often defined as empirical and descriptive and involves the collection of data that focuses on numerical reference with statistical frequencies reported rather than reporting of subjective meaning (Cresswell 2014). This positivist approach to research holds the belief that whatever is observed by the human senses can be regarded as fact. Thus, positivism suggests that mathematics, logic and analysis of collectable data can allow the interpretation of all human behaviours (Parahoo 2006).

Within this next section the writer allows enquiry of these approaches. Reference will be made to just some of the literature reviewed, in that, the strengths and weaknesses of both approaches are outlined, providing rationale for the choice of the most suitable method chosen for the present study.

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In quantitative research methods such as questionnaires, surveys and experiments are often used to gather information, but these approaches are often regarded as being enervated and unimaginative (Mulhall 2003). Conversely, Walker (2005) argues that the research designs involved in quantitative research allow gathering and advancing knowledge whilst providing questions that may form enquiry for further research.

It is generally accepted that both approaches, quantitative and qualitative, have the potential to provide valuable contribution to the body of evidence base (Cresswell 2014). Therefore, in order to select the correct approach for any new study it is deemed important to compare and contrast any pertinent studies in relation to the area of intended study (Oppenheim 1992). This review offers deliberation, not only of the intended study, but also provides a further opportunity to reflect on past research relative to the particular phenomenon under investigation (Parahoo 2006).

Upon review of the literature relating to constipation the writer has unearthed a number of studies in relation to the subject. For example, in 2009 in the United States, Schnelle et al. utilised a quantitative observational approach to study the prevalence of constipation symptoms in faccally incontinent nursing home residents. This study also involved testing of the impact of an intervention, where the researchers provided brief toileting assistance to 111 of their nursing home residents. In this study Schnelle et al. (2009) also reviewed patient data from personal bowel dairies and from patient medical records. This approach did appear appropriate to this particular study. However, given that the present study will not involve any necessary intervention or relate to the impact of such, an observational type study would not appear suitable in this instance.
In comparison, in 2002, in Australia, Annells and Koch explored the experiences and responses of older people in relation to constipation. In this research they examined the available solutions to constipation and their related effects. These researchers utilised a mainly qualitative, descriptive approach which allowed for exploration of the feelings and composite stories of participants in seeking solutions in an uncertain conglomerate of treatments. Quantitative research methods were also utilised in identifying concurrent medications used. This study again appears robust, clearly outlining the use of qualitative methodology in the exploration of feelings, perceptions and participant’s personal enquiry. Furthermore, the study draws comparison with the writer’s study, although the utilisation of the multi method approach by the Annells and Koch (2002) indicates the need for flexibility in choice of approach (Parahoo 2006). This approach will facilitate the conduct of a comprehensive study that will provide for the accumulation of data that is rich in content. (Oppenheim 1992).

Another comparable study to that of the writer was that of Fosnes et al. carried out in 2011 in Norway. The researchers wished to study the effectiveness of laxatives in 197 older person patients in a long term nursing home environment. The research methodology involved a quantitative, cross-sectional, descriptive, purposive approach. Data were collated from case report forms, medical records, participants and from information gleaned from the next of kin. Specific variables were recorded to allow for measurement of correlation thereby provide further understanding of how the independent variables might cause change in the dependant variable (constipation) (Bowling 2005). This methodology appeared to most effective, in that it showed the effectiveness of these everyday treatments from a real life perspective. (Fosnes et al 2011).
Upon close analysis and reflection of these and the many other studies reviewed, the author has been able to compare and contrast the methodologies used in previous related research studies and make the correct choice of a quantitative approach to this study. The rationale for this choice lies in the understanding of the research objectives, which is concerned with establishing prevalence and also in quantifying a number of key health care elements relating to constipation.

3.6 Research Design
A research design is an overall plan of how a researcher proposes to capture the necessary data to answer the questions being asked in the research study (Polit and Beck 2006). The designs common in quantitative research include, experimental, quasi experimental and non-experimental descriptive (Polit and Beck 2006). An example of an approach in an experimental design is a randomised control trial (Polit and Beck 2006). In these types of studies, participants with similar characteristics or conditions are recruited and randomly allocated into one of two groups. One group is offered an intervention within the trial and the other group will receive no intervention or may continue with their current treatment or may be given a placebo. This allows the researcher to study two groups for a specified amount of time to measure the effect of the change/intervention between the two groups (Greenhalgh 2010).

In some circumstances, however, researchers may not always be able to allocate people into different experimental groups. This is often the case in health care settings wherein it may not be possible to randomise participants form the same clinical setting, into different care groups. In such cases researchers may find it necessary to carry out quasi-experimental studies. Using this approach it is possible to compare one treatment group with another comparable group. However, this approach may mean that the two groups may already differ
importantly at the outset, thus risking the introduction of bias into the research project. Thus, many researchers would often view this approach as being as not truly experimental (Polit and Beck 2006, Parahoo 2006). One such study was carried out by Cebeci and Celik (2007) in which they aimed to determine how discharge training and counselling provided to patients who had undergone cardiac surgery affected the patients' self-care ability and on the problems encountered following discharge. The objectives were to help these patients develop self-care behaviours to deal more comfortably with the problems caused by their condition. The study involved 2 groups, an intervention group which were given discharge counselling and training by the researcher and the control group who were given routines only by the nurse with any queries answered by staff. The findings of this study concluded that those patients in the intervention group did experience fewer problems post discharge than those in the control group. However, as inferred by other researchers, and agreed by the study authors, due to the non-random nature of the sample and the single research site there were limitations in the generalisation of the study findings (Polit and Beck 2006, Cebeci and Celik 2007, Parahoo 2006).

A randomised control trial (RCT) was carried out by Moore et al. (2012) exploring whether 3 hourly repositioning using the 30 degree tilt would reduce the risk of patients developing a pressure ulcer. The study population consisted of older people living in residential care who were at risk of developing a pressure ulcer. The population was divided into 2 groups, the intervention group were repositioned every 3 hours using the 30 degree tilt and the control group were repositioned using 90 degrees lateral rotation every 6 hours. The results showed that the control group 11% developed pressure ulcers whilst in the intervention group only 3% developed signs of pressure ulcers (Moore et al. 2012). Thus an RCT design is appropriate when exploring cause and effect, as was the case in the Moore et al. (2012) study.
In the writer’s study, no interventions were implemented; rather it was the intention to explore the issue of constipation without any manipulation of variables. This type of approach is common in descriptive studies. For this reason the author considered the use of a cross-sectional descriptive survey design to allow for the collection of variables relative to this study and its intended population (Polit and Beck 2006). The descriptive nature of the writer’s study allows for information to be collected without changing the environment or manipulating the variables of interest. Furthermore, descriptive approaches are often employed in cross-sectional research designs and are frequently utilised to determine prevalence (Parahoo 2014).

A cross-sectional design involves collecting data from groups of people who may be experiencing the same condition or phenomenon where the data are collected at one point in time (Walker 2005). It is a design often used to study prevalence, and appears to work well in providing a ‘snap shot’ of data from one point in time, exploring why and how things are happening, measuring quantities and/or differences and relationships among existing variables. A cross-sectional descriptive survey lies within the positivist paradigm (Walker 2005) and for the purpose of the writer’s study involved chart reviews, a survey and the measurement of resources used to manage constipation among the study participants.

The writer explored other similar studies that used a cross-sectional approach to ensure that the chosen approach was appropriate. For example, In 2007 Hosia-Randell et al. chose a cross sectional approach to assess the prevalence and associated factors regarding laxative use in older people living in a nursing home in Helsinki. The researchers suggested that their study design enabled them effectively investigate the association between existing variables in relationship to constipation among nursing home patients (Hosia-Randell 2007). Again, this study compared well to this writer’s work, thus provides further reassurance that the chosen
design, a cross sectional survey approach, was appropriate to allow for the study aims to be thoroughly explored (Hunger 2001).

3.6.1 Surveys
Surveys are used to collect descriptive data in the form of questionnaires and chart reviews (Parahoo 2006). For example the Irish population the census is a survey in which the whole population of this country is involved. Such data collection provides a comprehensive picture of Irish life and help to determine the needs of society into the future (Irish Central Statistics Office 2011). As with the census, the central focus of surveys relates to what people do, identification of their health needs, how they care for these needs and, as in this author’s study, how different variables may have an effect on these needs (Polit & Hunger 1999). There are, however both advantages and disadvantages of survey type questionnaires. The main disadvantage often refers to the questions themselves. (Polit & Hunger 1999). These authors also stress that these type of data collection instrument must contain questions that will accurately collect the information relevant only to the area of study. Questions must be clear, unambiguous and precise, allowing for a degree of sensitivity, whilst leaving little room for bias within the questioning (Burnard and Morrison 1994). This can be particularly difficult in the use of self reporting surveys or otherwise unstructured interview schedules. This type of data collection tool needs to allow to overcome any communication barriers, most especially in terms of health related studies in which medical terminologies can be difficult to understand. Unstructured interviews are also known to be typically time consuming and may become tiring for the participants. (Gearing et al. 2006).

For the intention of this particular study the necessary data was available in each patients’ clinical notes, this data was collected by means of chart reviews, This review of participants medical charts allowed researchers to effectively collect only the necessary information and to compare and contrast a number of variables pertaining to study populations. The charts
reviewed were in the form of nursing notes and clinical data with information gathered using a pre designed data collection database. The information was specifically collected by the writer, who had gained prior consent from each individual participant involved (Gearing et al. 2006).

In research terms the information gathered from chart reviews is referred to as retrospective data (Parahoo 2006). This means that data were collated from past records or charts and the data used to inform current concerns (Cresswell 2014). Prospective data collection is also utilised in research and enables researchers to study data over time, for example, determining outcomes, such as the development of a disease or investigating suspected risks (Burnard & Morrison 1994). Ex post facto data collection refers to an approach where information is collected after the fact and may be deemed useful in investigation of past events, allowing for improvement in outcomes due to the benefit of hind sight.

To provided added reassurance further review of the evidence base in relation to this method was deemed appropriate by the writer. This again provided that the most relevant and robust data collection method available was being utilised in the current study. For example, in 2010 Wee et al. used a survey design in order to evaluate the effects and cost of managing constipation in patients in palliative care services in Oxford, England. This study appears to be relevant to this writer’s study in that a retrospective review of the chart records of 58 patients within this service was carried out. The work of Wee et al. (2010) enabled determination of the burden of constipation among the study population. This was achieved through the determination of the everyday effects of this condition on these patients. This appears to be a robust study in which the necessary data collection method was used to determine the effect of constipation on the individual participants and also to demonstrate that earlier and more effective interventions for this condition could lead to improve clinical and economic benefit (Wee et al. 2010).
In order to determine local policy in the management of constipation the writer conducted a short interview with each of the directors of nursing in the study sites. Open ended questioning was considered and again, before embarking on this approach, a review of the evidence base was carried out. Parahoo (2006) suggests that open ended questions are synonymous with interviewing; however he highlights the importance of ensuring that the questions involved are clear and unambiguous. In this way all respondents will be enabled to interpret each question in the same way. Open ended questions are valuable and allow respondents some freedom in expressing themselves without the constraints of the use of closed questioning. Indeed, Harland and Holey (2011) suggest that open ended questioning in quantitative research adds richness to the data allowing enhancement of interpretation of the findings. However, the questions employed should be carefully designed and purposeful with a pre-determined and documented rationale (Harland and Holey (2011).

Kalischuk et al. (2013) carried out a quantitative, descriptive correlation study of preceptor’s views of their role in relation to working with nursing students. In this study Kalischuk et al. (2013) developed a six-part questionnaire with which open ended questions were asked of 31 preceptors, all of whom had worked with nursing students. Data from this questioning was analysed utilising content analysis and outcomes allowed for preceptors views to be heard and there in acted upon. This, Kalischuk et al. (2013) believed, encouraged preceptor retention, thereby positively influencing the experiences of future generations of nurses. This provided further validation and reassurance that the most appropriate methodology were chosen for the current study.

For the purpose of this study the variables collected were specific, measurable and relevant to the study objectives and criteria. Indeed, the variables included were consistent with previous
research (Fosnes et al. 2011, McKay et al. 2012). Furthermore, consultation with medical experts substantiated that the included variables were relevant to achieve the aims of the study. The variables included the following:

- General demographics (gender and age)
- Body Mass Index
- Prescribed drugs, regular, Pro re nata (PRN) use.
- Barthel Index Scores (allowing for independence/dependence of all activities of daily living)
- Constipation history and diagnosis.

3.7 Data collection
A review of the pertinent literature unearthed many collection tools which had effectively been utilised in previous studies of constipation (McCrea et al. 2009, Fosnes et al. 2011, and McKay et al. 2012). Whilst, these studies were explored in detail, none fitted the exact requirements for the writer’s study. Thus, for the purpose of this study the writer developed a bespoke data collection tool which included the integration of a number of these pre validated instruments. These included The Barthel index (Mahoney & Barthel 1965) (see Appendix 11), The Bristol Stool Chart (Lewis and Heaton 1997) (See Appendix 3) and the Rome 111 criteria (Drossman 2006) (see Appendix 1).

Further outline of these instruments is related within the following paragraph.

A pilot study of this instrument was carried out on the clinical notes of 10 patients. No difficulties were highlighted in this pilot. The instrument appeared to be valid and reliable and most suitable to collect the necessary data for the intention of this study. Further discussion of this pilot test is provided for in section 3.11 of this thesis.
The data collection included demographic information namely age, gender, body mass index and medication used for the treatment of constipation, (see Appendix 9). In addition the Rome III classification (Drossman 2006) of constipation was also used. This classification, established in 1991 by Drossman et al. is used to standardise definition of gastrointestinal disorders. In 2006 this expert based, multi-national committee developed the Rome III classification (Drossman 2006) of chronic constipation which has emerged as the most widely used for research purposes, and is cited by many researchers as being appropriate for determining the prevalence of constipation within intended research populations (Getliffe& Dolman 2005, Castledine et al. 2007, Tariq 2007, Leung et al. 2011, Boyle 2013).

To ascertain the relationship between the participant’s independence/dependence in relation to activities of daily living and how this might have influence on bowel function, the Barthel Index (see Appendix 11) was employed. This index was developed by Mahoney &Barthel in 1965 to evaluate patient’s self-care abilities in 10 areas, these included bowel and bladder control and in this each patient scored from 1 to 15 points in various categories depending on his or her need for help, such as feeding, bathing, dressing, walking and mobility. The aim is to establish the degree of independence from any help, physical or verbal, however minor or for whatever reason. Ohura et al. (2011) in their Japanese study of the reliability and validity of this instrument found that it was consistent in the assessment of function among older person residents in long term care facilities. From an Irish perspective, Harrington (2007) carried out a comparative study of this instrument and another dependence/independence screening tool. In this study Harrington (2007) found that the index allowed a quick measurement of a patient’s functional ability, providing an adequate valid and reliable report relating to each individuals status and outcomes. These findings, alongside the fact that this index was already in use in each of the six nursing homes of interest, provided reassurance of the appropriateness of this instrument for the current study.
Information pertaining to stool transit and consistency was also relevant to this study and to determine this, the Bristol Stool Chart (see Appendix 3) was used. This chart as devised by Lewis & Heaton (1997) and is cited by many researchers to be easily used in both clinical and research practice as a simple method of assessing stool transit time (Lewis & Heaton 1997, Grainger et al. 2007, Kyle 2011, Woodward 2012, and HSE 2013).

To conclude the data collection, a survey involving open ended questions was carried out. These questions were asked, by the researcher, of the Nursing Directors in each of the 6 nursing homes and allowed for determination of the prevalence of constipation among the participating residents, in addition to the identification of local policy in the management of this condition. The questions asked were:

- Do you have a policy on Constipation?

- How do you screen for constipation?

- How is this condition prevented?

- How many residents do you have in this nursing home?

- How many were within the inclusion criteria?

- (Although this information was not collected by these Nursing Directors, figures were verified by same to ensure further validity and reliability).

- How many gave their consent to participate?

The method employed to elicit answers from the Directors of Nursing, involved the individual responding to the author in the affirmative or negative to the specific question posed by the author. An opportunity was also given to provide details around the specific
policy, screening and prevention practices. Finally the Director of Nursing indicated how many patients resided in the nursing home and how many were constipated. The time taken to yield this information was approximately 5 minutes. Responses were analysed statistically.

Data for the complete study were collected using a data base stored on an encrypted and pre-coded lap top computer. Each participant was given a unique numerical identifier, which in no way could be linked to the individual. This not only provided for anonymity but ensured maintenance of ethical responsibilities in relation to all participants (Noble-Adams 1999).

3.8 Validity and Reliability
The attainment of precision in research is important, if a study is deemed not to be precise and accurate this will reflect on the findings and thus is a determination of the overall validity and reliability of the study. The validity of any study relates to how well the study measures what it set out to measure (Polgar and Thomas 2008). Wainer and Braun (1988) refer to a type of validity in research known as ‘construct validity’. In this they suggest that the construct is seen to be the initial concept, notion, or hypothesis of the research. Further, the construct under investigation will determine which data is gathered and how this data is utilised.

Content validity, also referred to as face validity defines how effective the instrument is in providing a true representation of the subject being assessed. In this type of validity one is concerned with whether the instrument includes all the relevant questions that relate to the subject of interest (Polgar and Thomas 2008). Concurrent viability refers to how well the instrument performs when compared to the gold standard. An example of this would be how well the questionnaire in measuring constipation? In this task this instrument should provide a concurrent standard of performance in allowing gathering a true representation of the
necessary assessment of constipation. This must compare to within the standards provided by all other similar instruments already being utilised, such as the Rome III criteria (Drossman 2006) or the Bristol Stool Chart (Lewis & Heaton 1997).

Parahoo (2006) suggests that there are two main questions to be asked of any questionnaire, does the questionnaire answer the research questions, and does it accurately represent the issues being studied. In terms of this criterion, validity of the bespoke data collection instrument used in the present study was assured. The instrument involved the use of a number of existing and pre-validated instruments added to which a number of other questions specific only to the present study (McCrea et al. 2009, Fosnes et al. 2011, and McKay et al. 2012).

Reliability is a measure of the consistency (Burns & Grove 2005). The test-retest is one measure of reliability, wherein the questionnaire is simply used on two occasions and resulting answers compared, if the results from the two data analysis sets are consistent with each other, then instrument is thought to be reliable. Another test often used is that of the alternative form test, in this the questions will be asked in two different ways or the wording substituted, without changing the questions. If the chosen instrument performed well in these tests it is deemed to be reliable (Oppenheim 1992).

This test was carried out and the instrument deemed to be reliable

The components of the instrument, namely the Barthel Index, the Rome 111 criteria, the BSC and the BMI assessment are well established instruments, widely used within the clinical setting, and are considered a reliable and valid means to establish the specific measurement under question (Mahoney & Barthel 1965, Lewis and Heaton 1997, Drossman et al. 1981) and thus were deemed appropriate for the current study.
3.9 Site/Population /Sampling

3.9.1 Study site
For the purposes of estimating point prevalence of chronic constipation the study setting involved 6 nursing homes in a rural location in Ireland. These sites were selected using purposive sampling as they were located within the clinical governance domain of the relevant Health Service Executive Research Ethics Committee, where ethical permission to conduct the study was sought. Permission to access the study participants’ was granted by the management team within the relevant nursing homes. Information posters (see Appendix 15) were clearly displayed in common areas within each nursing home. Each eligible participant and/or their next of kin were given the information poster pertaining to the study (see Appendix 15).

3.9.2 Population Inclusion/Exclusion Criteria
A research population is defined as a number of person or units from whom data may be collected (Parahoo 2006). These units may come from various sources depending on the study involved. The population is usually an accumulation of units that correspond with the inclusion criteria and are persons that are available and willing to take part in the research (Burns and Grove 2005). For the purpose of this study the population of interest was older persons residing in a nursing home setting.

In this study a protocol was drawn up which outlined the inclusion/exclusion criteria. This was deemed necessary in order that the target population was clearly defined (Burns and Grove 2005). From this it was possible to carefully select those that met the inclusion criteria. The following outlines the inclusion and exclusion criteria:

• Nursing Home residents over the age of 60 years, who have been resident in the nursing home for greater than six months, were invited to participate in the study.

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• Residents with known gastrointestinal diseases (inflammation /stricture /malignancy /intestinal resection) which might account for constipation were excluded from the study. No residents who did not have mental capacity were included in the study.

3.9.3 Sampling
There are two classifications of sampling designs, non-probability and probability (De Vaus 2002). In using non-probability sampling the researcher will select their participants on the basis of which persons are most suitable and most representative of the population of interest. Conversely, those who opt to utilise a probability sample will select participants from a population using random procedures.

In this study a purposive sampling strategy was used. This type of sampling, sometimes referred to as judgemental sampling, falls within the domain of non-probability sampling. Using this approach the researcher selects the required sample, having regard for the requirement to involve certain criteria and elements within the study. Further, as in this writer’s study, subjects are selected because they share the same characteristics, and these characteristics are fundamental to the study (Gerish and Lacey 2010 &Polit and Beck 2014). Purposive sampling is often criticised and is considered to be the least rigorous form of sampling (Burns and Grove 2005). None the less, the rationale for the choice of this type of sampling within this writer’s study was because the aim was to determine prevalence, causes, associated factors and effects of constipation, thus it was important to collect data from those affected by the problem. Furthermore, as prevalence is concerned with those who have the problem, in this instance, constipation, in order to calculate prevalence all those with the problem must be included (Blacktop 1996). Therefore, for the purpose of this study all eligible residents in the chosen nursing homes were invited to participate in the study.
The directors of nursing informed their nursing staff that the study was being undertaken. The nursing staff received information pertaining to the details of the study and in turn were able to outline the study to each of the eligible participants and answer any queries or concerns they had first-hand. These nurses gained consent of any eligible resident who wished to participate. This consent was then collated and verified by the writer who personally collected the data, imputing this information onto the encrypted lap top on site.

3.10 Ethical considerations.
3.10.1 Ethical approval
As outlined by Treece and Treece in 2007, a major premise of any research activity is that ethical principles and considerations are identified, observed and adhered to throughout the entire research process. As such, ethical considerations permeate all aspects of the study through to the communication, dissemination and publishing of all findings. In the case of this writer’s study, to ensure that the study design met with these principles, ethical approval for this study was sought and subsequently received from the Health Service Executive Research Ethics Committee (see Appendix 13).

3.10.2 Ethical issues
Holloway and Wheeler (2002) stress that all researches should be guided by the profession, legal and ethical rules which are laid down within every profession. In relation to the nurse researcher, An Bord Altranais (The Irish Nursing Board) clearly defines these rules in the nurse’s code of professional conduct and research guidelines (An Bord Altranais 2000). In adherence to these rules, the rights of all participants in this study were made clear and set within the four ethical principles. These are outlined by Holloway and Wheeler (2002) and further detailed below.
3.10.3 The principle of respect and autonomy.
Treacy and Hyde (1999) suggest that the principles of autonomy and respect are the cornerstones from which all ethical considerations involving individual participation within research may be built. In order to uphold these rights, all details including the nature and purpose of the study were explained to potential participants, in both oral and written form prior to receiving consent and before commencing the study. Further to this a staff nurse, familiar to each resident verbally explained the entire protocol of the study, allowing to answer any queries or concerns in advance of consent been gained. This allowed for greater empowerment of each participant, facilitating the making of informed choice and the opportunity to consent or decline participation in the said study. This writer was therefore assured that consent received from relevant participants was indeed informed.

3.10.4 The principle of non-maleficence
The concept of non-maleficence is outlined as the duty of the researcher to ensure that undue harm to the participant is avoided during the research process (Tracey and Hyde 1999). Throughout this study, the researcher remained vigilant, ensuring protection of each participant from any wrong be that physical, emotional or psychological. All data were collected anonymously. Furthermore, the data were collected from the participants’ clinical notes. Thus, once consent was received, no direct engagement with participants took place. Participants could withdraw data and consent from the study at any time.

3.10.5 The principle of beneficence
This principle of beneficence refers to the obligation on the part of the researcher to do good whilst promoting the participants welfare (Thompson et al. 2000). As constipation is known to be a significant problem for older adults, the conduct of the writer’s research has potential to benefit the participants, thereby adhering to the principle of beneficence. The writer firstly ensured that informed consent was received. Furthermore, throughout the study anonymity
and confidentiality of the individuals' within the study was ensured, thereby avoiding embarrassment or anxiety arising as a result of their involvement.

### 3.10.6 The principle of Justice

The principle of justice states that all participants within the research process should be treated equally (Hindshaw 2000). In order to ensure that this study was just and fair, the author ensured that all participants agreed to what was expected of them at the outset and were assured that no changes would be made to the nature of the study without their consent.

For the purposes of this study, the author assured that all participants were fully aware of the entire nature of this study. All participants and/or their next of kin were informed of the fact that the registered nurse would need to access their chart/medical file in relation to constipation nursing needs. Consent forms were signed by each participant. Approval was also gained from the Director of Nursing in each of the six nursing homes involved and the Research Ethics Committee. In relation to the open ended interviews, an interview schedule and all relevant information pertaining to this were submitted to the directors of nursing prior to commencement of any interviews (see Appendix 12 and 14).

### 3.11 Pilot Study

The term 'Pilot study' refers to a mini version of a full-scale study and may often be referred to as a 'feasibility study', as well as the specific pre-testing of a particular research instrument. The pilot study also allows for highlighting any problems in the proposed approach, improvement of the design as appropriate and the ironing out any unforeseen flaws (Oppenheim 1992). A Pilot of the data collection template was undertaken using the clinical notes of ten patients. These individuals were randomly chosen from within the population of
interest. Whilst these participants were afforded the same ethical consideration and those of the actual study, none of these persons took part in the main study.

The pilot study did not highlight any difficulties or unforeseen problems with the planned research approach. The interview schedule was tested by one of the nursing directors to which these questions were to be asked. The director concerned assured that the questions were both relevant and easily understood were applicable to the proposed study. Whereas, a pilot study does not guarantee success in the main study, it may provide valuable insight into the intended approach.

3.12 Data analysis
In this study statistical analysis was conducted using the Statistical Package for the Social sciences (SPSS) version 14. SPSS is a software package used for conducting statistical analysis, manipulating data and generating tables and graphs to summarise data (Greasley 2007). Before analysis began, data cleaning was conducted. This allowed for assessing of the data set, the variables and frequencies so that any errors, such as missing data or values, could be reviewed and if possible amended.

A random selection of data sheets was also selected in order to check the recorded data against that which was inputted. This provided further validation of the available data, allowing examination of variables across the population. The raw data were then measured in terms of frequencies and expressed as mean or median and range (Greasley 2007). These descriptive statistics allowed for the description of the essential features of the data and in doing this allowed the writer provide specific meaning of these variances. Frequencies were expressed in whole numbers and also in percentages. Parahoo (2006) suggests that percentages are often easier to draw comparison rather than using numbers. When reported in
tables and charts, as is in the present study, this facilitates the reporting of the data more concisely thereby allowing the reader to draw comparisons of the data without the need for further analysis (Parahoo 2006).

The very nature of descriptive statistics is to provide the means to summarise patterns within the data. This provided the ideal type of analysis to establish correlation. Bivariative correlation analysis was undertaken and this provided the necessary means to ascertain if there was linear correlation between two given variables. This enabled the identification of the existence of potentially statistically significant correlations between the relevant variables (Bowling 2005).

3.13 Conclusion
This chapter allowed the author to identify the methodology of this research project. This provides a comprehensive discussion of the underpinnings of the research process in its entirety. In outlining the objectives of this research, the author provided analysis of the two paradigms of nursing research and how these may influence the chosen research approach. For the purpose of this study a quantitative approach was used. The rationale for this choice lies clearly in the research objectives. These objectives concern prevalence and the quantifying of key healthcare elements relating to constipation.

The research design chosen was descriptive cross-sectional, this warranted for the manipulation of the variables of interest and the necessity to measure quantities and/or the relationships between the variables. Surveys were used to collect the necessary descriptive data and chart reviews allowed further collection of information to compare and contrast the variances within this data. A questionnaire involving open-ended questions was used to ask
questions of the Directors of each nursing home, therefore providing for the determination of prevalence and local policy in relation to this condition. Purposive sampling was determined most suitable to estimate point prevalence of this condition within the 6 nursing homes (study settings) and also determined those most suitable for this study.

The ethical principles of respect, autonomy, non-maleficence, beneficence and justice were upheld throughout this project. Consent was gained from all participants; further approval was gained from all directors of nursing within each of the study sites. Ethical approval was provided by the HSE (Research Ethics Committee).

Data analysis was undertaken through the use of SPSS, a software package used for conducting statistical analysis within social services. This allows one to assess variables and frequencies, and to generate tables and graphs to summarise such data.
Chapter 4: Presentation of Findings
Chapter 4: Presentation of Findings

4.1 Introduction

This chapter presents an exploration and analysis of the findings of this study. To enhance readability this chapter has been divided into 10 sections. Section 1 provides an introduction to this chapter. Section 2 presents the flow of participants in the study, thereby essentially identifying the study population. Section 3 explored the demographics of the study population. Section 4 presents the figures for the prevalence of constipation among the study participants, with section 5 outlining the characteristics of the study participants. Section 6 quantifies the use of laxatives among the study participants. This is followed by section 7 which provides figures relating to local policy, treatments and screening of constipation within the clinical settings. Section 8 describes the results of the analysis of the micro costing of the treatment of constipation. Finally section 9 and 10 provide a summary and conclusion of these findings.

4.2 Study Population

This study was carried out in six nursing homes in Ireland. Figure 1 outlines the flow of participants through the study. The total population within these nursing homes was 503 patients. Of these patients, 189 (37.5%) met the inclusion criteria and of these a total of 125 (25%) patients provided informed consent to participate yielding a consent rate of 66% (n=125/189). However, as some data was missing or deemed unreliable in a number of charts, final data collection and analysis was undertaken on 94 persons (75%; 94/125) yielding an attrition rate of 25% (n=31).
4.3 Demographics

4.3.1 Age
Figure 1 outlines the distribution of ages among the study population, with table 1 providing the results of the descriptive analysis of the age profile data. As can be seen from figure 2 and table 1, the mean age was 83 years (median 84 years; range 38 years; minimum 60 years, maximum 98 years).
Figure 2: Age Distribution

Table 1: Age Profile of the Participants

<table>
<thead>
<tr>
<th>Total Number of Participants</th>
<th>94</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Age</td>
<td>83.77 years</td>
</tr>
<tr>
<td>Median Age</td>
<td>84 years</td>
</tr>
<tr>
<td>Range</td>
<td>38 years</td>
</tr>
<tr>
<td>Minimum Age</td>
<td>60 years</td>
</tr>
<tr>
<td>Maximum Age</td>
<td>98 years</td>
</tr>
</tbody>
</table>
4.3.2 Gender
Table 2 outlines the gender distribution of the study population. As can be seen, 68% (n=64) were female and 32% (n=30) were males.

<table>
<thead>
<tr>
<th>Gender</th>
<th>Percent (Number)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>32% (30)</td>
</tr>
<tr>
<td>Female</td>
<td>68% (64)</td>
</tr>
<tr>
<td>Total</td>
<td>100% (94)</td>
</tr>
</tbody>
</table>

4.3.3 Barthel scores
Figure 2 outlines the distribution of the Barthel scores for all 94 participants, with table 3 providing the results of the descriptive analysis of the Barthel scores. As can be seen from figure 3 and table 3, the mean Barthel score was 9.60 (range 19; min score 1, max score 20). This indicates a medium level of dependency, on average, among the study participants.
Figure 3: Barthel Scores

Table 3 Barthel Scores

<table>
<thead>
<tr>
<th>Total Number of Participants</th>
<th>94</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>9.60</td>
</tr>
<tr>
<td>Range</td>
<td>19</td>
</tr>
<tr>
<td>Minimum</td>
<td>1</td>
</tr>
<tr>
<td>Maximum</td>
<td>20</td>
</tr>
</tbody>
</table>
4.4 Prevalence of Constipation
The total population in all of the six participating nursing homes was 503 persons. Of these, 189 were deemed to fulfil the inclusion criteria, in other words were suffering from constipation. Thus the prevalence of constipation among the study population was 37.57% (189/503). No statistically significant relationship was identified between age and constipation among the study participants \((p=.949)\) see table 4. However, a statistically significant relationship was identified between gender and constipation among the study participants \((p=.028)\) see table 5. However it is important to note that there were considerably more females than males in the study.

Table 4: Correlation between Age and Constipation

<table>
<thead>
<tr>
<th>Parsons correlation</th>
<th>-.007</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sig. (2-tailed)</td>
<td>.949</td>
</tr>
<tr>
<td>Number of participants</td>
<td>94</td>
</tr>
</tbody>
</table>

Table 5: Correlation between Gender and Constipation

<table>
<thead>
<tr>
<th>Parsons correlation</th>
<th>-.226</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sig. (2-tailed)</td>
<td>.028</td>
</tr>
<tr>
<td>Number of participants</td>
<td>94</td>
</tr>
</tbody>
</table>
4.5 Characteristics of the Population

4.5.1 B.M.I. (Body Mass Index)
Table 6 outlines the BMI scores among of 93 of the participants (missing data for 1 participant). These figures indicate that the mean BMI is 27.41 (SD: 8.36).

<table>
<thead>
<tr>
<th>BMI Scores</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>93</td>
</tr>
<tr>
<td>Range</td>
<td>58.88</td>
</tr>
<tr>
<td>Minimum</td>
<td>13.20</td>
</tr>
<tr>
<td>Maximum</td>
<td>72.08</td>
</tr>
<tr>
<td>Mean</td>
<td>27.41</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>8.36</td>
</tr>
</tbody>
</table>

Further analysis identified that there is a statistically significant relationship between age and BMI scores \(p=0.0001\) (see table 7)

<table>
<thead>
<tr>
<th>Table 7: Correlation between age and BMI scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>Persons correlation</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>Number of participants</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td>-.287</td>
</tr>
<tr>
<td>.0001</td>
</tr>
<tr>
<td>94</td>
</tr>
</tbody>
</table>
4.5.2 Bristol Stool Chart (BSC)
Table 8 outlines the scores for the BSC. Of the 94 participants, data were missing for 3 participants. Results of the analysis of the scores for the remaining 91 participants indicate the overall scores for BSC varied from 1-7. Interestingly, the majority were given a score of 3 or 4 (58%; n=55), meaning that these individuals were suggested to have relatively normal stool consistency. Conversely, 31% (n=28) were given scores of 5-7 indicating diarrhoea or urgency in bowel movements. Further analysis noted no statistically significant relationship between age and BSC scores (p=.312) or gender and BSC scores (p=.256).

Table 8: Bristol Stool Chart Scores

<table>
<thead>
<tr>
<th>BSS</th>
<th>Number (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1 (1)</td>
</tr>
<tr>
<td>2</td>
<td>7 (7)</td>
</tr>
<tr>
<td>3</td>
<td>11 (11)</td>
</tr>
<tr>
<td>4</td>
<td>44 (47)</td>
</tr>
<tr>
<td>5</td>
<td>21 (22)</td>
</tr>
<tr>
<td>6</td>
<td>5 (5)</td>
</tr>
<tr>
<td>7</td>
<td>2 (2)</td>
</tr>
<tr>
<td>Missing</td>
<td>3 (3)</td>
</tr>
<tr>
<td>Total</td>
<td>94 (100)</td>
</tr>
</tbody>
</table>
4.5.3 The Rome III Criteria.
Figure 4 outlines the results of the analysis of data pertaining to the Rome III criteria. Of the study participants 85% (n=80) were scored as suffering from constipation.

Figure 4: Rome 111 Criteria

4.6 The use of laxatives
In this study, 44% (n=43) participants were using laxatives on a PRN basis, 30% (n=27) on a regular basis and 26% (n=24) were prescribed both regular and PRN laxatives. In total, 11 different types of laxatives were in use. All of these laxatives were not consistently used across the 6 study sites, see figure 5, the green box indicates the names of the specific laxative used and which nursing homes used them.
Figure 5 Laxatives used within the Study settings

<table>
<thead>
<tr>
<th>Laxatives</th>
<th>Nursing Home 1</th>
<th>Nursing Home 2</th>
<th>Nursing Home 3</th>
<th>Nursing Home 4</th>
<th>Nursing Home 5</th>
<th>Nursing Home 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lactulose</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Microlax</td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Glycerol</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Movicol</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Senokot</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fybogel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Senna</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Bisicodyl</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dulcolax</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>Macrogol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Dulphalac</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>X</td>
</tr>
</tbody>
</table>

Table 9 outlines the number of laxatives being used by the individual study participants. Almost all participants were using treatment for constipation (97%; n=91). Furthermore, the majority of participants (59%; n=55) were using more than one type of laxative. Interestingly 8% (n=8) were using between 4 and 5 different types of laxatives.

Table 9: Number of Laxatives in Among the Study Participants

<table>
<thead>
<tr>
<th>Number of Laxatives</th>
<th>Frequency (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>3 (3)</td>
</tr>
<tr>
<td>1</td>
<td>27 (29)</td>
</tr>
<tr>
<td>2</td>
<td>28 (30)</td>
</tr>
<tr>
<td>3</td>
<td>28 (30)</td>
</tr>
<tr>
<td>4</td>
<td>6 (6)</td>
</tr>
<tr>
<td>5</td>
<td>2 (2)</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>94 (100)</strong></td>
</tr>
</tbody>
</table>
Further analysis identified a statistically significant relationship between age and the number of PRN drugs used ($p=0.0001$). However, no statistically significant relationship was noted between age and regular use of laxatives ($p=0.843$).

### 4.6.1 Types of Laxatives in use

Table 10 (below) outlines the types of laxatives in use, including the percentage of participants using the laxative, the percentage using the laxative PRN or regularly and the daily dose for PRN use and regular use.

#### 4.6.1.1 Lactulose

Among the study population 76% ($n=71$) were using Lactulose, whereas 24% ($n=23$) were not using Lactulose. Of those using Lactulose, 35% ($n=25$) were using it regularly, whereas 65% ($n=46$) were using it on a PRN basis. The average use was 15mls/day for those using Lactulose regularly use and 32mls/day for those using Lactulose on a PRN basis.

#### 4.6.1.2 Duphalac

Only 10% ($n=9$) participants were using Duphalac, 22% ($n=2$) of these participants used it regularly whereas 79% ($n=7$) used it on a PRN basis. The daily dose for regular use of this laxative was 1 sachet and for the PRN use was 1.4 sachets.

#### 4.6.1.3 Movicol

Of the study participants, 54% ($n=51$) were taking Movicol. Of these, 53% ($n=27$) were using it regularly whereas 47% ($n=24$) were using it on a PRN basis. The average daily number of sachets used by those regularly taking Movicol was 1.7 sachets and for those on PRN usage was 1.4 sachets.
4.6.1.4 Microlax
Of the study participants, 20% (n=19) were using Microlax. Of these participants 21% (n=4) were using Microlax regularly whereas 79% (n=15) were using it on a PRN basis. The average daily number of Microlax used among regular users was 1.25 enemas and for PRN users were 1.07 enemas.

4.6.1.5 Senokot
Senokot was used by 19% (n=18) of the participants, with 63% (n=12) of these using Senokot regularly and 32% (n=6) on a PRN basis. For those using Senokot regularly, the average daily use was 2.25 tablets and for PRN users was 1 tablet.

4.6.1.6 Fybogel
Fybogel was used by 11% (n=10) participants. Of these participants, 40% (n=4) used it regularly, whereas 30% (n=3) used it on a PRN basis. For those using Fybogel regularly, the average daily use was 1.75 sachets and for PRN users was 2 sachets.

4.6.1.7 Senna
Senna was used by 21% (n=20) of the population, with 75% (n=15) of these using it on a regular basis and 23% (n=5) on a PRN basis. For those using Fybogel regularly, the average daily use was 2 tablets and for PRN users were also 2 tablets.

4.6.1.8 Glycerol
Only 1 participant used Glycerol and this was used by the participant on a regular basis, with an average daily dose of 1 suppository.
4.6.1.9 Bisacodyl
5 participants used Bisacodyl, with 20% of these participants (n=1) using it regularly and the remaining 80% (n=4) using it on a PRN basis. For those using Bisacodyl regularly, the average daily use was 2 tablets and for PRN users were 1.5 tablets.

4.6.1.10 Ducolax
Ducolax was used by 4% (n=4) of the participants. Of these 75% (n=3) used it regularly, with an average daily dose of 1.3 tablets. Furthermore, 25% (n=1) used it on a PRN basis with an average daily dose of 1 tablet.

4.6.1.11 Magrogol
A total of 10% (n=9) participants used Magrogol. Of these 22% (n=2) used it regularly with an average daily dose of 1 tablet. Conversely, 88% (n=7) used Magrogol on a PRN basis with an average daily dose of 1.4 tablets.

The laxative used most often was Lactulose which was used by 71.28% of participants; conversely, Glycerol was least often used (1.06%).
Table 10: Laxative use among the participants

<table>
<thead>
<tr>
<th>Name of laxative</th>
<th>Number of participants using this laxative</th>
<th>Number using this laxative regularly</th>
<th>Number using this laxative PRN</th>
<th>PRN average daily dose used</th>
<th>Regular average Daily dose used</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lactalose</td>
<td>(71) 76%</td>
<td>(25) 35%</td>
<td>(46) 65%</td>
<td>1.5 ml</td>
<td>32 ml</td>
</tr>
<tr>
<td>Duphalac</td>
<td>(9) 10%</td>
<td>(2) 22%</td>
<td>(7) 79%</td>
<td>1 sch.</td>
<td>1.4 sch.</td>
</tr>
<tr>
<td>Movicol</td>
<td>(51) 54%</td>
<td>(27) 53%</td>
<td>(24) 47%</td>
<td>1.4 sch.</td>
<td>1.7 sch.</td>
</tr>
<tr>
<td>Microlax</td>
<td>(19) 20%</td>
<td>(4) 21%</td>
<td>(15) 79%</td>
<td>1.07 sch.</td>
<td>1.25 sch.</td>
</tr>
<tr>
<td>Senokot</td>
<td>(18) 19%</td>
<td>(12) 63%</td>
<td>(6) 32%</td>
<td>1 tab.</td>
<td>2.25 tab.</td>
</tr>
<tr>
<td>Fybogel</td>
<td>(10) 11%</td>
<td>(4) 40%</td>
<td>(3) 30%</td>
<td>2 sch.</td>
<td>1.75 sch.</td>
</tr>
<tr>
<td>Senna</td>
<td>(20) 21%</td>
<td>(15) 75%</td>
<td>(5) 23%</td>
<td>2 tab.</td>
<td>2 tab.</td>
</tr>
<tr>
<td>Glycercol</td>
<td>(1) 100%</td>
<td>(1)</td>
<td>(1)</td>
<td>1 supp.</td>
<td>1 supp.</td>
</tr>
<tr>
<td>Bisacodyl</td>
<td>(5) 20%</td>
<td>(1) 20%</td>
<td>(4) 80%</td>
<td>15 tab.</td>
<td>2 tab.</td>
</tr>
<tr>
<td>Ducolax</td>
<td>(4) 4%</td>
<td>(3) 75%</td>
<td>(1) 25%</td>
<td>1 tab.</td>
<td>1.3 tab.</td>
</tr>
<tr>
<td>Macragol</td>
<td>(9) 10%</td>
<td>(2) 22%</td>
<td>(7) 88%</td>
<td>1.4 tab.</td>
<td>1 tab.</td>
</tr>
</tbody>
</table>

4.7 Local Policy on Constipation Prevention and Management

From analysis of the answers to the questions asked of the Directors’ of Nursing within each of the six participating nursing homes, results indicated that that all 6 nursing homes related that they had a local policy on constipation prevention and management. Specifically, 2 Directors’ of Nursing indicated that they were using the Norgine policy (a risk assessment tool for constipation), one Director of Nursing suggested that they were using the Bristol stool chart, however this is not a prevention and management guide, rather is used as a diagnostic tool. Finally, 3 Directors’ of Nursing outlined that they had designed their own local policy; however, the specific origins of these policies were not identified. Screening for constipation in all sites involved daily bowel checks whilst prevention of constipation,
involved the trilogy of encourage increased intake of fluids as appropriate, dietary modifications and increased exercise for the participant.

The total number of participants residing in all of the nursing homes was identified as being 503 persons, the number of individuals with constipation was identified as 189 yielding a constipation prevalence of 37.5%.

4.8 Cost Analysis of the Treatment of Constipation
In order to quantify the expenditure on medication used for the treatment of constipation. Cost analysis was carried out and this is outlined in Table 10. This costing involved two elements: the measurement of the quantities of resource use (q) and the assignment of unit costs or prices (p). The quantity of laxative use was estimated through a review of patients’ medical records. Laxative use (resource use) was measured for 14 days. Both regular and PRN laxative use were captured. The average daily dose per laxative was derived from the medication records of the 94 patients included in the analysis. Unit costs for laxatives were sourced from the MIMS (MIMS 2013) and these costs are ex-factory prices. Therefore, no mark or margins (pharmacy/wholesaler) are included in this price.
Table 11: Cost Analysis of the Treatment of Constipation

<table>
<thead>
<tr>
<th>Description</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Cost of Regular Laxative Use (14 Days)</td>
<td>€457.74</td>
</tr>
<tr>
<td>Total Cost of Regular Laxative Use (365 Days)</td>
<td>€11,933.97</td>
</tr>
<tr>
<td>Total cost of PRN Laxative Use (14 day)</td>
<td>€502.46</td>
</tr>
<tr>
<td>Total cost of PRN Laxative Use (365 day)</td>
<td>€13,099.91</td>
</tr>
<tr>
<td>Total Cost Regular &amp; PRN Laxative Use (14 Days)</td>
<td>€960.20</td>
</tr>
<tr>
<td>Total Cost Regular &amp; PRN Laxative Use (365 day)</td>
<td>€25,033.88</td>
</tr>
</tbody>
</table>

As can be seen from table 11, the total cost of laxatives for this two week period of study was €960.20. This figure was further calculated to account for 1 year total laxative expenditure yielding a figure €25033.88, of which €11,933.97 would account for regular use of laxatives and €13,933.97 for PRN use.

4.9 Conclusion
This chapter has allowed presentation of the findings of this study. In this an overview of the flow of study participants we allowed to identify the study population. The total population of all six participating nursing homes was 503. Of this population, 189 met the inclusion criteria and 125 gave informed consent, therefore, final data collection and analysis was carried out on 94 persons (75%, 94/125).
This yielded an attrition of 25% (N=31). Of this total of 94 participants the mean age was 83.77, the maximum age being 98 years with a mean of 83.77 and a minimum of 60 years. Figures of Gender showed that 68% (64) were female and 32% (30) were male.

The prevalence of constipation was analysed at 37%, interestingly this appears higher than figures already mentioned in recent international research (Annells & Koch 2002, Grainger et al. 2007, Hosia-Randell et al. 2007, Fosnes et al. 2011, and Mc Kay et al. 2012).

Mean Barthell score were analysed at 9.6, with a range of 19, a minimum of 1 and a maximum of 20. BMI scores were calculated for a total of 93 participants, the range of which was 58.88, minimum 13.30, maximum 72.80 and medium 27.41.

Whilst there was no significant relationship between age and constipation, in this study there did appear to be significant relationship between gender and constipation. However it is most important to note that more women than men participated in this study (68% v 32%).

Almost all participants used laxatives (79%), with 8% using 4-5 different laxatives. The most frequently used laxative was Lactulose, this accumulated to 71.28% of this population taking this drug. Use of this laxative alone was averaging at 32mls per day. There was significant relationship between age regular drug uses, however no there was no correlation between age and PRN drug use. An analysis of cost of this condition was provided. This was measured in 2 elements, laxative use (Resource q) and unit price cost (price p) this analysis found that the total cost of regular laxative use over 14 days was €457.74. As can be seen from table 10, the total cost of laxatives for this two week period of study was €960.20. This figure was further calculated to account for 1 year total laxative expenditure yielding a figure €25033.88, of which €11,933.97 would account for regular use of laxatives and €13,933.97 for PRN use.

These findings will be further analysed and discussed within the next chapter.
Chapter 5: Discussion of Findings
Chapter 5: Discussion of Findings

5.1 Introduction
Chapter 4 presented the results of the study findings and this chapter, 5, aims to critically discuss the findings generated from the analysed data and will discuss these findings with regard to the empirical and theoretical literature that exist surrounding the research topic. Subsequently any identified similarities and correlations will be highlighted and discussed in terms of the current study. This chapter will be presented in 8 sections, section 1 will allow for an introduction of this chapter and also provides a reminder of the study aims and objectives. Section 2–9 will discuss all relevant findings of the study. Finally, section 8 will provide a conclusion of this chapter.

5.1.1 Research Question
The research question for this study was: “What is the prevalence of constipation, causative factors and laxative use among Nursing Home Residents in Ireland?”

5.1.2 Study Aims.
The aims of this study were to:

1. Determine the prevalence of constipation in an NH population in Ireland using the Rome III Criteria.
2. Assess the use of laxatives among the study participants
3. Determine local policy in management of constipation among the study population
4. Conduct a micro cost analysis of the current treatment of chronic constipation among the study participants

5.2 Population Demographics.
This study involved a population of 94 residents from 6 nursing homes in Ireland.
5.2.1 Age
The average age of the study participant was 83.77 years. This figure is similar to figures reported by other research undertaken among nursing home populations, with reports provided of mean ages of 80 years (Fosnes et al. 2011, Hosia-Randell et al. 2007).

5.2.2 Gender
Of the 94 participants, 68% were reported as being female and 31% were male. This figure is lower than that of Hosia-Randell et al. (2007), who, within their study of laxative use among older Nursing Home Residents in Helsinki, Finland, reported female residents to be more prevalent in their study rather than males (80% vs. 20% respectively). Similarly, McCrea et al. (2009) in their study of gender related difference of self-reported constipation in the United States noted that 79% of his study population were women. These figures are further substantiated by the National Institute of Clinical Excellence Report (2009) which suggested that constipation affects twice as many women rather than men in the United Kingdom.

5.3 Prevalence of Constipation
In this writer's study, 37.57% of the study population were experiencing constipation at the time of data collection. These figures are similar to those of previous studies. For example, Annells and Koch (2002) in their studies of constipation within the older person population noted that between 20% and 50% of older people living within community settings in the United Kingdom experienced constipation. A further study of the use of laxatives in NH residents in Finland, found that 55% of residents were regularly using laxatives, indicating that this population was experiencing symptoms of constipation (Hosia-Randell et al. 2007). Furthermore, Fosnes et al. (2011) in their study of the effectiveness of laxatives in older person in Norway noted that 31% of the study population were experiencing constipation at the time of their study. However, in their evidence based review of this condition,
McKay et al 2012 suggests figures of 15 to 20% of older adults living in the community reporting symptoms of constipation and up to 75% among nursing home residents.

It is evident that constipation is a problem, or potential problem among older persons living in the nursing home setting. Constipation is known to impact negatively on health related quality of life, causing pain and discomfort for the individual (Norton, 2006). Bearing this in mind, it becomes evident that the effective screening, prevention and management of this condition are a priority. Furthermore, given the predicted changes in population demographics, with the predicted rise in the number of older persons into the future it is important that a proactive approach to the prevention and management of this condition be adopted. Not only will this have an impact on the lives of individuals, but it will also contribute to health and social gain through the reduction in unnecessary suffering and expenditure on this largely preventable problem (Gage 2010).

5.4 Characteristics of the Population

5.4.1 Barthel Score
In this study, the mean Barthel score was 9.60, indicating a medium level of dependency, on average, among the study participants. Similar findings were noted by Gage et al. (2010) where 44% of their study population were found to have moderate dependency as assessed using the Barthel score. It is interesting that older persons residing in care homes report a higher prevalence of infrequent bowel movements than their matched counterparts living in their own homes (Kinnunen 1991). Thus, it is important to consider how the environment of care, in addition to increasing dependence on others to achieve the activities of daily living may influence normal bowel habit (Holman et al 2008).
5.4.1 Body Mass Index
Analysis of the figures for BMI identified an average score of 27.41. These figures suggest that, on average, participants are classed as being overweight (The British Medical Association (BMA, 2011). However, the minimum BMI in this study was 13.20, whilst the maximum was 72.80. This suggests that there is substantial variation in BMI among the study participants. None the less a statistically significant relationship between age and BMI scores (p=.0001) was identified in this study. This is an interesting finding and is in keeping with The Health Service Executive reports which note that people in Ireland, in general, are becoming heavier and this trend appears to continue with age (HSE 2013b).

A number of researchers (Chister et al. 2002, Castledine et al. 2007 & Woodward 2012) link lack of exercise and lack of mobility to constipation and herein the average BMI figures may be suggestive of a misalignment between food intake and energy expenditure. Furthermore, Pourhoseingholi et al. (2009) found that 60% of patients with functional constipation were overweight. Interestingly, the link between obesity and constipation has been noted as far back as the early 1980’s when Pecora et al. (1981) identified that constipation frequency was 8.3% in obese patients and 1.5% non over weight patients, further, this finding was found to be statistically significant (p≤0.001).

5.4.2 Bristol Stool Scoring (BSC)
The majority of participants (58%; n=55) were assessed as having a normal stool consistency (Heaton et al. 1997). A simple explanation for this scoring trend is that all participants were already on some form of laxative therapy. Therefore, it is reasonable to suggest that these laxatives were having the desired effect facilitating an average to normal bowel movement consistency. Conversely, 31% (n=28) of participants were scored as 5-7 indicating the presence of diarrhoea or urgency in bowel movements. Akhtar and Pačda (2005) outline how
severe constipation can lead to diarrhoea, thus, in this study the number of patients assessed as 5-7 on the BSC requires further investigation. Furthermore, as the majority of participants (59%; n=55) were using more than one type of laxative with 8% (n=8) using between 4 and 5 different types of laxatives, it is possible that diarrhoea might be a side effect of these treatments (Akhtar & Padda 2005). Bearing in mind the impact of constipation of the individuals health related quality of life (Norton 2006), a review of medication use, in conjunction with careful assessment of bowel status among the participants, may point to aspects of care that would benefit from revision. Essentially, from the outset, adequate assessment is paramount, this will provide baseline information on each individual, providing the necessary information in relation to each individuals health care needs i.e., bowel habits, frequency, consistency etc. There in outlining BSC scoring and the relative need for assistance in this area.

As already alluded, Laxatives should necessarily only be us when all other treatment has been tried and even, at that, deemed to be a short term treatment to allow resolution and restoration of regular bowel function (Chister et al.2003).

5.4.3 Rome III Criteria
Of the 94 participants, figures suggest those 85% (n=84) were assessed as having constipation. This finding is unsurprising, as the inclusion criteria specified that the individual should be suffering with constipation. However, it is interesting to note that 15% (n=10) were considered not to suffer with this constipation. This finding may have arisen as the individuals were using laxatives which enabled normal bowel movements in this cohort, thus they may have been misclassified as not being constipated (Woodward 2012). Indeed, the use of laxatives is a confounding variable as this treatment impacts on bowel function and thus the ability to accurately assess true constipation (Woodward 2012).
5.5 The Use of Laxatives

In this study, almost all participants were using laxatives, with 44% (n=43) using them on a PRN basis, 30% (n=27) on a regular basis and 26% (n=24) were prescribed both regular and PRN laxatives. In total, 11 different types of laxatives were in use. A statistically significant relationship between age and the use of PRN laxatives (p=.0001) was found in this study and is also reported by Tariq (2007) who noted that the prevalence of constipation and the use of laxatives increased with age. These findings clearly show the high use of laxatives within this population. All residents were seen to be prescribed at least one form of laxative and in some instances participants were taking 4-5 laxatives regularly. These figures appear high and allows for more discussion and further research into alternative management strategies and/or treatment in relation to this condition.

The most frequently used laxatives were Lactulose (75%; n=71) and Movicol (48%; n=45). Both Lactulose and Movicol are classified as osmotic laxatives. Annells & Koch (2002) found that osmotic laxatives are the most commonly used among older persons and the most often prescribed by doctors. These findings concur with those of Hosia–Randell et al. (2007) who, within their study of residents in a long term nursing home in Helsinki, found that osmotic laxatives were used by 48% of participants while only 14.3% used stimulant laxatives.

It is interesting to note that the majority of participants (59%; n=55) were using more than one type of laxative. Furthermore, 8% (n=8) were using between 4 and 5 different types of laxatives. This finding is supported by the work of Cusack et al. (2012) who found, also within an Irish health care setting, that participants in long-term care significantly (p<0.001) more likely to take multiple laxatives when compared to older persons residing in the community care setting. Overuse of laxatives can have physical, psychological and social
effects on wellbeing (Cusack et al. 2012). Thus it is argued that careful assessment and
diagnosis of the cause of constipation, in addition to consideration of non-pharmacological
approaches to the management of constipation should be considered as a priority in the
management of this condition among older persons.

5.6 Local Policy
Results of the one to one interviews with the Directors of Nursing identified that all 6 nursing
homes reported having a local policy on constipation. Indeed 2 Directors reported using the
Norgine policy, 1 reported using the Bristol stool chart and 3 were using their own local
policy. Screening for constipation in all sites involved daily bowel checks whilst prevention
involved the trilogy of fluids, diet and exercise.

Daily bowel checks are considered to be an important component of assessment of
constipation (Kyle 2005, Tariq 2007 and Woodward 2012). This Norgine policy has been
endorsed by Kyle (2011), and appears to be a well-recognised and utilised tool which allows
for a person centred assessment of individual patient needs in relation to constipation. Whilst
the Bristol Stool Chart is also commonly used as part of a screening regime for constipation,
it has been suggested that it may lead to unreliable findings if patient screening is not carried
out prior to the use of laxatives, as laxatives may give a false impression of stool consistency
(Woodward 2012). Indeed, as mentioned previously the majority of participants (58%; n=55)
were assessed as having a normal stool consistency, yet 85% were classed as suffering from
constipation. Clearly there is some confusion here which is largely unhelpful for clinical
practice and patient care. Indeed, as with the study of Cusack et al (2012), the participants
were using multiple laxatives which in itself impacts on the sensitivity and specificity of
assessment of bowel function. The rationale for the use of multiple laxatives among this
study group was not explored; however, given the ongoing problem of multiple laxative uses
in older persons in Ireland, it is important that this problem be explored in greater depth.
Indeed, the trilogy of fluids, fibre and mobility, whilst not always possible, is often referred to as the first and most efficient management and treatment of this condition (Chister et al. 2003, Peate 2005, Kyle 2011, Boyle 2012, Woodward 2012, and HSE 2013).

Management of any health care needs always requires a person centred approach, including medication management, care regimes, patient education, health promotion and use of therapies from an all-inclusive perspective (Watts et al. 2013).

5.7 Costs of Constipation Treatment
Results of the cost analysis of the medications used in the treatment of constipation for a 14 day period were estimated at €960.20. When calculated over a 365 day period, figures suggest that the use of laxatives within this population for one year would equate to €25,033.88. Furthermore, €11,933.97 may be applied to regular use and €13,099.91 may be applied to PRN use.

It is suggested in the wider literature that laxative and prescription use consumes a significant part of health care expenditure. Indeed, in 2001 Petticrew et al. suggested that over 46 million a year was being spent on laxative use within the United Kingdom alone. Furthermore, within the United States, Pekmezaris et al. (2002) suggested the cost of over the counter laxative use was more that 400 million dollars. Whereas Pekmezaris et al. (2002) suggest that laxatives are the most frequently prescribed medication in long term care setting in the United States, the associated costs are not reported. However, a further study outlined that the mean charges per hospital discharge for constipation increased statistically significantly from $8869 in 1997 (adjusted for long-term inflation) to $17,518 in 2010 (P<0.001). Furthermore, the older person (65-84 years) accounted for the largest percentage of constipation discharges (Sethi et al. 2014).
A recent European study by Bruce Wirta et al. (2014), though not confined to older persons alone, suggests that the annual treatment of constipation per person in a region of Sweden was €951. There is little evidence of studies of costs related to treatment of constipation from an Irish perspective. However, in one Irish study of drug prescribing within the older person, Ryan et al. (2008) found that 6.8% of all medicine prescribed was for gastrointestinal conditions.

From this study and from the literature in general, it is reasonable to conclude that constipation has both an economic and personal burden on the individual and is a significant resource burden on society as a whole. It is interesting to note therefore, that Dennison et al. (2005) suggests that constipation prevention programmes have demonstrated cost savings and thus warrant greater inclusion in overall approaches to the management of this debilitating problem. In fact, Nour-Eldein et al (2014) found that lifestyle modification, education on constipation significantly reduced the severity of symptoms and improved the quality of life of older persons suffering from constipation within a nursing home setting. Whilst investigating the relevant literature pertaining to constipation it is noted that there is much reference to the changes in demographics within the population of older people experiencing this condition. Repeatedly, reports refer to the fact that changing demographics will necessitate changes in the care being provided for those experiencing this condition, be that now and in the future (HIQA 2009, NICE 2009, Barrett et al. 2011, World Health Organisation 2011, HSE 2013

5.8 Evidence Based Practice and the Assessment and Management of Constipation

Allowing for these referred reports and findings, it is therefore apparent that there is room for improvements in relation to the care of constipation within our practices. Evidence-based practice allows for these improvements. This is a multi-disciplinary approach to all care
practices which allows care. A care which is indeed based on evidence. Providing us with evidence which allows that these practices have been studied and therefore are based on experience within practice settings. This facilitates care regimes which are proven, tried and tested. Providing a basis of care to assist each and every care provider make decisions of care based on evidence of this care (Aveyard & Sharp 2012).

In this study findings relate that the approach to constipation appears to be somewhat erratic and therefore necessitates change. An Bord Altranais (2009) suggests that as nurses and health care providers we have the opportunity to question and investigate this care. Especially when this care is being provided for older persons. They further suggest that with the increasing number of people over 65 years and older, there is a strong correlation between illness and the aging process (ABA 2009). This, again, is clearly evident within this study, therefore, underlining the need for change, whilst, therein providing rationale to allow to facilitate this necessary change (Ellis 2010).

We, as health care providers, do not need to be alone in this change but in conforming with international standards of best practice (CBPS) and in the interest of this particular study facilitating the implementation of an internationally recognised strategy of care for those suffering with constipation. A strategy which will allow for consistency of care. The integration of assessment, diagnosis, prevention, and from these, a management regime under one common policy allowing that we as nurses and healthcare professionals might allow for a care which continues to improve. As with all care provision, care of the older person must be responsive, it must be individual, but ever changing, moving forward alongside the technological advances and challenges that might provide for the progression of care (ABA 2009).
5.9 Conclusion
Findings relate that of the 94 people who participated in this study, 37% suffer with constipation, Again, whilst these figures are similar to that of other international studies (Fosnes et al. 2011, Hosia-Randell et al. 2007). The fact remains that they only serve to reiterate the need for more investigation. There is a need to provide for this condition, to find answers and guide solutions. The questions remain as to why this condition is affecting so many of our population and is most prevalent within our aged population. Norton (2006) provides much discussion of the negative effects of this condition on the life of each and every sufferer, therefore people are suffering. Not only physically but psychology (Norton 2006). Characteristics of this population found that many more women than men are affected by this condition, this begs the questions, does this relate to the fact that more women than men took part in this study or is it true to say those women are more vulnerable to the effects of this condition? Indications from the Barthell Scoring equates that 44% of this population are moderately dependant. Many researchers relate lack of exercise and mobility to affect constipation (Peate 2005, Castledine 2007, Kyle 2007). This also correlates with the high averages of BMI scores, with the average at 27.41, suggesting that most of these participants are overweight. Although, we must be reminded that there is a flow of variances in this scoring from 13.2 minimum to 78.20 maximum, this still allows that most people were overweight. Although BSC and Rome III scores would suggest that many people are experiencing normal bowel function, this may be explained by the fact that most of these participants were already receiving laxative therapy at this time, many on 4-5 laxatives daily. This again relates to the rising costs of this condition, which is highlighted from the United States, The United Kingdom and Sweden but once again there is a dearth in the literature from an Irish perspective. Within this study, costs of this condition are too high. This further highlights the need for further research in this area. It provides once again to reiterate the need for an integrated management strategy, which will not only provide for adequate
assessment and management of this condition but might allow to provide a universally accepted definition of constipation, therein allowing for timely diagnosis and recognition of the symptoms of this all too common painful condition.
Chapter 6: Strengths & Limitations & Recommendations
Chapter 6: Strengths, Limitations and Recommendations

6.1 Introduction
The previous chapter discussed the findings of this study as interpreted from the results obtained from the data analysis. This chapter presents the conclusions and recommendations of this study. Section 1 will provide an introduction to this chapter, Section 2 will allow discussion of the strengths and limitations, section 3 will provide for dissemination of findings, section 4 refers to the implications of these findings. Section 5 will discuss how these findings may apply to nursing practice, education and management. This is followed by section 6, which discusses the implication of the findings for future research, section 7 provides a reflection by the writer on the experience of undertaking this research. Finally a summary and conclusion is provided.

6.2 Purpose of the Study
This study set out to address the following:

1. To determine the prevalence of constipation in an NH population in Ireland using the Rome III Criteria (Drossman 2006).

2. To assess the use of laxatives among the study participants

3. To determine local policy in the prevention and management of constipation among the study population

4. To conduct a micro cost analysis of the current treatment of chronic constipation among the study participants.

The study design comprised three elements: an estimate of the point prevalence of chronic constipation (CC), semi-structured interview on local policy for management of constipation and a micro costing of the resources used in the management of CC.
6.3 Strengths and limitations

6.3.1 Limitations
In order that the findings from this study may be interpreted in context, it must be acknowledged that this research contains a number of limitations. Indeed, Dempsey & Dempsey (2000) suggest that all studies have limitations and wherever possible researchers should acknowledge these limitations in the conclusions of the study. Therefore, the writer will identify the limitations of the current study.

At the outset one limitation of note was the sample size. Whilst the study was well advertised in each of the six nursing homes of study, there was a limited response rate in some of these homes. It is not apparent if this arose because the residents were not fully aware of the study taking place or if there was little interest in participation within this older person population. The very nature of the study itself, although a most common digestive complaint within the older person, is often seen to be a taboo subject. Indeed, constipation often causes much distress and embarrassment for the sufferer (Li-wee 2008). Thus it is possible that many people were reluctant to discuss this condition (Woodward 2012). This limitation may limit the generalisability of research findings (Polit and Beck 2006).

A further limitation arose due to the amount of missing data within the patients clinical nursing notes, this was especially apparent in relation to bowel movement recording and daily bowel checks. Gaps in documentation were evident throughout all of the study sites. Unfortunately, as this study involved a retrospective survey design it was essential that the recorded information was accurate in order to enhance the reliability and validity of findings. Limitations in documentation is not unique to this writer’s study, indeed, Moore and Price (2004) in their survey of documentation practices amongst nursing staff found that there appeared to be a somewhat disorganised approach to this essential of nursing care.

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Finally the authors own inexperience with the research process was also a limitation of the study. The author is a novice researcher, thus at times there was a lack of necessary skills to fully understand the process and this proved difficult. However, guidance from the academic supervisor was invaluable. Furthermore, reference to a variety of recommended research publications and lectures on research skills aided this process.

6.3.2 Strengths
The main strength of this study is that it is the first estimation of prevalence of constipation from an Irish perspective. Furthermore, the fact that the data were collected by a registered nurse, with extensive experience in nursing within the care of the older person setting, facilitated making sense of the available figures. Results of the data analysis show that the findings are similar to other European, and USA studies (Annells & Koch 2002, Fosnes 2012, McKay 2013), suggesting that there is reliability in data collection. Fundamentally this study adopted a pragmatic approach and as such provides a unique insight into the problem of constipation within the study population; this is thought to be a major strength and an invaluable resource of any study and added vigour to external validity.

6.4 Dissemination of findings
One of the greatest challenges facing health promotion and disease prevention is translating research findings into evidence-based practice (Kerner et al. 2005). Without dissemination the research findings will remain unknown and as such dissemination is considered an integral component of the research process (Polit & Beck 2014). More importantly, without dissemination, others involved in similar research will not appreciate what is known and not known around the research subject and thus may repeat research unnecessarily (Polit & Beck 2014). Furthermore, relevant findings will not be applied to the population of interest if they remain unknown (Polit & Beck 2014). These findings of this current study will be
disseminated both locally and nationally. As the author is a staff nurse in Intellectual Disability Services, locally she will present these findings to colleagues. As this service is also a student nurse training facility this may also provide encouragement to student nurses to become involved in research and will add to the already existing base of evidence which they appraise as part of their studies. In addition, the findings will also be made available nationally with a presentation of these findings back to the six nursing homes who participated in the study. This process is planned to be carried out before the end of 2014. Further dissemination, locally will take place at the Faculty of Nursing & Midwifery, International Nursing & Midwifery Research & Education Conference 2015. An abstract will also be submitted for a relevant international conference, either for a poster or an oral presentation.

It is the writer’s intention to publish the findings of this research in a relevant journal; further the thesis will be available within the library of the college at which the writer is a registered student. This will ensure that present and future research students may avail of the information provided within this study as assistance towards their own training and continued professional development.

6.4.1 Implications of findings
Having carried out an extensive literature review in this subject area it was apparent to the researcher that from the available theoretical and empirical literature available there was little research which had been carried out from an Irish perspective. This highlighted a gap in the literature and provided the author with a rationale to carry out this research within the Irish health care setting. Ultimately, previous research carried out in other countries is further substantiated by these findings of the present studies. Further discussion of this point is now presented.
6.4.2 Prevalence of Constipation
In this study constipation prevalence was estimated at 37.5%, this figure is higher than some of the published research, for example, prevalence of 20% are reported by Fosnes et al. 2007, 15-20% by McKay et al. 2012, 15-20% from Annells & Koch (2002) and lower than the 55% reported by Hosia-Randell et al. (2007). The higher prevalence of constipation among women in this current study is similar to other studies (Fosnes et al. 2011, Hosia-Randell et al. 2007).

6.4.3 Laxative use.
Laxative use in this study was high among the study participants. However, as all participants were suffering with constipation it is reasonable that laxatives were used to ease the symptoms of this condition. Such use of laxatives is reiterated within other published research (Hosia-Randell et al. 2007), suggesting that there is a need to review laxative use. This suggestion is common within the published literature and importantly this writer’s research has identified a similar problem within the Irish health care setting. It should also be noted that the Director of Nursing of all nursing homes involved cited the trilogy of diet, exercise and increased fluid intake as a commonly used measure for the prevention of this condition. Interestingly, many authors have also cited this trilogy as management of constipation (Peate 2005, McKay et al. 2013, Boyle 2013 and Wald et al. 2013). However, given the high mean BMI of participants in the current study, it is evident that a revision of this trilogy is required within the study sites.

6.4.4 Cost analysis
The findings of the cost analysis within this current study are important, as it points to an area of expenditure that warrants further exploration. Within the international literature (Annells & Koch 2002, Fosnes et al. 2011, McKay et al. 2013), time and again, the expenditure on the treatment of constipation is thought to be extensive and recommendations are presented for the need of standardisation in the prevention and management of this
condition. Thus, this current study has highlighted an important area of clinical care that requires review.

6.5 Implications for nursing practice education and management

In terms of nursing practice, it is worthy of note that 37% of the older population are suffering with constipation. This condition is not just a somewhat bothersome complaint but should be seen by all health care professionals as a common complaint which causes much pain, distress and embarrassment to every sufferer (Kyle 2007). The quality of life of these individuals is also negatively impacted, most especially within the older person population (Norton 2006). The subject of constipation itself is often seen as taboo and a cause of much embarrassment and this may further impact on the psychological distress of individuals and on the subsequent under reporting of symptoms (Wilson 2005 and Norton 2006). Findings relating to local policy and care provision suggest that all six nursing homes have policies on the care provision for this condition; however management appears to involve a high use of laxatives.

Findings from this study and other published research acknowledge that educational initiatives are needed to enhance the use of appropriate risk assessment and management and thereby improve the care of patients suffering constipation in long term settings (Grainger et al. 2007). Indeed, An Bord Altranais (2000) in their clinical practice guidelines stress that nurses should possess the competence to deliver all necessary care, ensuring that they are informed and therefore accountable for this deliverance of this care. The findings from this study calls for nurses to be educated on the most up to date evidence based practice regarding prevention and management of constipation.
6.5.1 Recommendations for future research
The writer recommends carrying out a further study, not only on a larger sample size, but over an increased time period. In employing a larger sample size and an increased time frame in which to carry out this study may increase the validity and reliability of findings. This would also allow time to explore some of the questions which have arisen from the present study. For example, in relation to gender it is interesting to note that prevalence does appear much higher in the female population. However, it is unclear whether this relates to the fact that there are simply more women resident in nursing home care than men, or do women actually in general suffer more symptoms of constipation than their male counterparts?

In general, the rates of constipation are high, particularly in the older person population, however, further study would allow for comparisons among older and younger persons. Furthermore, comparing figures with those in palliative care services, those with disabilities and even those of different ethnicities might allow for a more focussed approach to constipation prevention and management nationally.

Laxative use in this study is high; this implies that costs of managing this condition are also high. Further study may provide additional analysis of these costs, allowing for in-depth analysis of the assessment and management of this condition. This may highlight the need for a more effective screening, assessment, prevention and management strategy for constipation. Although it is noted that all 6 nursing homes participating in this present study did report having specific policies in relation to this necessary care, these policies are somewhat diverse. This may present an opportunity to research a more comprehensive and universally compatible tool which may be used to assess, screen and manage this condition. Ultimately, this may impact on prevalence and in doing so will allow for more effective care for those experiencing this condition (HIQA 2009).
Time and time again throughout the literature, reference is made to the lack of a unified definition of constipation. This has been reported by many researchers as a barrier to the effective assessment, management and hence treatment of this condition. Although the Rome III Criteria (Drossman 2006) appears to be the most accepted definition of this condition, its reliability has been questioned and at times is considered to be an inadequate diagnosis of constipation definition (Getliffe & Dolman 2005, Castledine et al. 2007, Tariq 2007, Leung et al. 2011, Boyle 2013). This calls for future research which may lead to a universally adapted and accepted definition which might be used in both clinical practice and for the purposes of future research.

6.6 Reflection
Upon reflection of this study the writer has considered this study, not only in relation to the subject matter or indeed the population of interest but to the writer herself. At the outset the writer did not have the necessary skills to fully understand the process and at times found difficulties. More often she considered that the task, in terms of her own abilities, was unrealisable. However, with the necessary academic teaching, direction and supervision the research process began to unfold. Guidance from the researcher’s academic supervisor was invaluable. Reference to a variety of recommended research publications and lectures on research skills further aided this process. With hindsight and the priceless knowledge and experience acquired from this journey, there is the realisation that the writer has extended her own knowledge base. This has provided to improve her skills, allowing opening up new directions and the confidence to move further forward in the quest to answer just some of the many questions being asked of healthcare services today.
6.7 Conclusion
This Chapter provided discussion of the strengths, limitations and recommendations from within this study. Again the aims of this study were highlighted, the limitations were outlined. This suggests that the population of study was small. Whilst the study was well advertised within each of the six study sites, responses were slow. The study was individually explained by familiar staff within these units however, it is suggested that the nature of the study alone may be a cause of some embarrassment and distress too many suffers, accounting for the fact that many individuals were reluctant discuss this personal compliant.

The writer also noted many gaps in patient notes, this missing data allowed to decrease the number of eligible participants therefore effecting the study population. A major strength of this study was that it is the first estimation of prevalence of constipation from an Irish perspective. Data was collected by a registered nurse, first-hand. Being familiar with this population allowed that she had first-hand knowledge and the ability to make sense of the available data.

Dissemination of findings is always a challenge, but the writer, being a registered nurse in a student training facility will ensure that these findings are not only available within her services, and the services who participated in the study but she will ensure that all student nurses from within the facilities in which she is a preceptor will have access to these findings. Further dissemination will take place within the Faculty of Nursing and Midwifery of which the writer is a student herself. An extensive review of the evidence basis highlighted a gap in Irish research on the subject of constipation. The implications of these findings will allow providing for this gap. These findings are further substantiated by previous international research findings. Prevalence of constipation is high (37.5%). Laxative use is also high and again correlated to findings from an international perspective. Cost of management of this condition is very high. These findings have many implications for nursing practice and
management. The fact that 37% of older persons are experiencing constipation lends that we need further investigations of this condition. In terms of further research we need to explore the many questions of constipation. Apparently this condition is more prevalent in the female population, this necessitates further research, in general our older population are suffering, and 37% of our population may be experiencing pain, discomfort or distress. This is 37% too many.
Chapter 7: Conclusion to the Thesis
Chapter 7: Conclusion to the Thesis

7.1 Introduction
This chapter provides a conclusion to this thesis. In this the key points relating to this condition and the related evidence from the review of the pertinent literature will be further addressed. This will be presented within the context of the key findings of the study and their associated implications for practice, education and research.

7.2 Conclusion to the Thesis
Constipation is an unpleasant and often distressing condition, which may affect anyone at any time (Kyle 2011). Many researchers refer to this condition as not, in fact, a disease in entity but a term which is often used to describe the difficulties that many people experience with their bowel movements (Grainger et al. 2007, Kyle 2007, McKay et al. 2012, & Boyle 2013). The prevalence of this condition is high, most especially among older persons (Kyle 2007, McKay et al. 2012, and Boyle 2013). However, from an Irish perspective there is little evidence to substantiate any of these suggestions and this provided a research/practice gap.

This current study found a high prevalence of constipation within older person participants and thus identified that constipation is an important problem among those residing in the nursing home setting. Furthermore, prevalence overall was high among females and this is substantiated within the international literature (Annells & Koch 2002, Hosia-Randell 2007 & Fosnes 2011). This, in itself, points to the need for a more in-depth analysis of the role of gender in constipation prevalence.

One of the major concerns among the published research is the lack of an adequate and unified definition of this condition. Whilst throughout the literature assessment of bowel habits is often referred to as ‘subjective’ it is, therefore, difficult to define what exactly is
considered to be a ‘normal’ bowel movement. This imposes further challenges in the understanding of this condition (Grainger et al. 2007). As a definition of constipation, The Rome III was established by Drossman et al. (1981). This has been further developed in 2001 by an expert based, multi-national committee to allow for a clearer definition of this condition within research populations. This criterion was hailed by many to provide a clear definition of this condition, not only from a research perspective, but also within the clinical environment (Drossman et al. 2006). However this criterion has been repeatedly questioned by others, as it is not always possible within these criteria to differentiate actual constipation from those experiencing irritable bowel syndrome (Kyle 2007). Again the writer has pointed to the need for future research to establish a universally accepted tool which would adequately define constipation and therein lead to a more timely assessment, treatment and management regime to be developed (Chister et al. 2003).

Laxative use within this study is high and with this the associated costs are also high. Changing population demographics suggest that these costs are going to get higher. Indeed, people are living longer; therefore the older population is increasing. With this longevity comes the ‘expected’ changes in physical health, one of which is symptoms of constipation and therein the use of laxatives. (NICE 2009).

Older people worry about their bowel habits; they believe that regular bowel habits are a necessity of good health. Constipation in older people is continually associated with depression, anxiety and immobility. This has even been related as a cause of much psychological distress (Norton 2006).

The very fact that the older population, one of the most vulnerable populations are suffering provides that we must drive change.
From the interviews with the Directors of Nursing within all of these six nursing homes it is noted that whilst all of these sites had policies on assessment, screening, treatment and management of this condition, these policies are quite diverse. Future research is needed to develop a nationally recognised standard approach to the prevention and management of constipation. The Irish Nursing Board, An Bord Altranais (2002) have provided every registered nurse and midwife with guidelines of their scope of nursing and midwifery practice within these guidelines, whilst defining this practice, this document provides that nurses should possess adequate knowledge and ability to provide quality patient care. A care which might influence future care. A care based on evidence, guidelines, policies and protocols developed collaboratively with reference to up to date legislation and research findings. This clearly infers that there is no room for deliberation.

This is not a choice; it is our duty of care (An Bord Altranais 2002).
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Murphy K. (2005) A Qualitative Study Explaining Nurses’ Perceptions of Quality Care for


Ryan C., O’Mahony D., Kennedy J., Weedle P., Barry P., Gallagher P. & Byrne S.(2008) Appropriate Prescribing in the older person: An Investigation of Two Screening Tools, Beers Criteria Considering Diagnosis and Independent of Diagnosis and Improved Prescribing in


Appendices
### Appendices

#### Appendix 1 Rome III Criteria

<table>
<thead>
<tr>
<th>ROME III CRITERIA</th>
<th>GUIDANCE: PLEASE PLACE AN ‘X’ IF THE RESIDENT HAS TWO OR MORE OF THE FOLLOWING in the last 2 weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>a: Straining during at least 25% of defecations</td>
<td></td>
</tr>
<tr>
<td>b: Lumpy or hard stools in at least 25% of defecations</td>
<td></td>
</tr>
<tr>
<td>c: Sensation of incomplete evacuation for at least 25% of defecations</td>
<td></td>
</tr>
<tr>
<td>d: Sensation of anorectal obstruction/blockage for at least 25% of defecations</td>
<td></td>
</tr>
<tr>
<td>e: Manual manoeuvres to facilitate at least 25% of defecations (e.g., digital evacuation, support of the pelvic floor)</td>
<td></td>
</tr>
<tr>
<td>f: Fewer than three defecations per week</td>
<td></td>
</tr>
<tr>
<td>g: Loose stools are rarely present without the use of laxatives</td>
<td></td>
</tr>
</tbody>
</table>
# Appendix 2 Norgine Risk Assessment Tool

<table>
<thead>
<tr>
<th>Medical Condition</th>
<th>Toileting Facilities</th>
<th>Mobility</th>
<th>Nutritional Intake</th>
<th>Fluid Requirement Calculation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical depression</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemorrhoids, and fissures, rectocutaneous fistulae, local anal or rectal pathology</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>History of constipation</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Imputed cognitive/physical impairment</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple fractures</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parkinson's disease</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pectus excavatum</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rheumatoid arthritis</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spinal cord conditions (injury, disease or congenital)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stroke</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Current Medication</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Aluminium antidiarrhoeics</td>
<td></td>
</tr>
<tr>
<td>Anticholinergics</td>
<td></td>
</tr>
<tr>
<td>Antidepressants</td>
<td></td>
</tr>
<tr>
<td>Antiemetics</td>
<td></td>
</tr>
<tr>
<td>Calcium-channel blockers</td>
<td></td>
</tr>
<tr>
<td>Calcium supplements</td>
<td></td>
</tr>
<tr>
<td>Diuretics</td>
<td></td>
</tr>
<tr>
<td>Iron supplements</td>
<td></td>
</tr>
<tr>
<td>Non-steroidal anti-inflammatory drugs (NSAIDs)</td>
<td></td>
</tr>
<tr>
<td>Opioids</td>
<td></td>
</tr>
<tr>
<td>Tropic antidepressants</td>
<td></td>
</tr>
<tr>
<td>Polypharmacy (more than 5 drugs including ones not on this list)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Patient's Name</th>
<th>Patient's Date of Birth</th>
<th>Patient's NHE Number</th>
</tr>
</thead>
</table>

**Instructions**

1. Tick all relevant categories in each table.
2. There may be more than one tick in a table.
3. Add all the ticks together.
4. Fill in the number of ticks in the box below.
5. Date and sign

**Fluid Requirement Calculation**

\[\text{Fluid intake (ml) = Weight (kg) \times 30 \times \text{actual fractional fluid intake}}\]

### Appendix 3 Bristol Stool Chart

<table>
<thead>
<tr>
<th>TYPE 1</th>
<th>Separate hard lumps, like nuts (hard to pass)</th>
<th>Constipated; Commence or increase laxatives</th>
</tr>
</thead>
<tbody>
<tr>
<td>TYPE 2</td>
<td>Sausage-shaped but lumpy</td>
<td>Constipated; Commence or increase laxatives</td>
</tr>
<tr>
<td>TYPE 3</td>
<td>Like a sausage but with cracks on its surface</td>
<td>Ideal Stool Consistency; Maintain laxative dose</td>
</tr>
<tr>
<td>TYPE 4</td>
<td>Like a sausage or an egg, smooth and soft</td>
<td>Ideal Stool Consistency; Maintain laxative dose</td>
</tr>
<tr>
<td>TYPE 5</td>
<td>Soft blobs with clear-cut edges (passed easily)</td>
<td>Slightly Too Soft; Decrease laxative dose</td>
</tr>
<tr>
<td>TYPE 6</td>
<td>Ruffly pieces with ragged edges, a mushy stool</td>
<td>Too Soft; Decrease laxative dose</td>
</tr>
<tr>
<td>TYPE 7</td>
<td>Watery, no solid pieces ENTIRELY LIQUID</td>
<td>Too Soft; Stop taking laxatives for a day or so</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>DAY</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>NUMBER OF BOWEL MOVEMENTS TODAY</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TYPE OF BOWEL MOVEMENT (SEE ABOVE)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

# Appendix 4 Eton Risk Assessment Tool

## Continence Care

### Constipation Risk Assessment

Pick the scores in each table, several scores may be used. Add scores to gather and record in the box.

**Service user's name:**  
**DOB:**

<table>
<thead>
<tr>
<th>Medical condition</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Spinal cord conditions (injury, disease or congenital)</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Parkinson's disease</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiple sclerosis</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rheumatoid arthritis</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diabetes</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stroke</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Breathlessness</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Impaired cognition/dementia</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cancer</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Postoperative</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Clinical depression</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Haemorrhoids, anal fissure, rectocele, local anal or rectal pathology</td>
<td>2</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Mobility (Tick one only)</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bedbound</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wheelchair bound</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Chair bound - transfers with assistance</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walks with aids</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walks short distances unaided</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Walks around freely</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Toileting facilities</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Unable to sit on toilet</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commode by bed in care home</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Supervised use of lavatory/commode</td>
<td>4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Raised toilet seat (without footstool)</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Independent use of lavatory</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Medication (See below for calculation table)

<table>
<thead>
<tr>
<th>Current medication</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5x drugs taken regularly</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opioids</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>NSAIDS</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Anti-cholinergics</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tricyclic antidepressants</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diuretics</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Calcium channel blockers</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Iron supplements</td>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No drugs</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Nutritional Intake

<table>
<thead>
<tr>
<th>Nutritional Intake</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI less than 20 or greater than 30: Score =</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Difficulty in swallowing</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Unable to chew/poor-fitting dentures</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Needs to be fed</td>
<td>3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Three balanced meals a day</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Fluids

<table>
<thead>
<tr>
<th>Fluids</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Not achieved</td>
<td>5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Achieved</td>
<td>0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Fluid Requirement Calculation

30ml fluid per 1 kg of body weight  
Minimum fluid intake = weight in kg \( \times \) 30ml  
\[ \text{Estimated actual fluid intake} \]

### Risk Predictor

40 = High Risk  
30 = Medium Risk  
20 = Low risk  
10 = Monitor

### Date Score Signature

<table>
<thead>
<tr>
<th>Date</th>
<th>Score</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Appendix 5 Victoria Bowel Performance Chart (BPS)

#### Victoria Bowel Performance Scale (BPS)

<table>
<thead>
<tr>
<th>BPS Score</th>
<th>-4</th>
<th>-3</th>
<th>-2</th>
<th>-1</th>
<th>0</th>
<th>+1</th>
<th>+2</th>
<th>+3</th>
<th>+4</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Constipation</strong></td>
<td>Impacted or Obstructed</td>
<td>Formed Hard with pallets</td>
<td>Formed Hard</td>
<td>Formed Solid</td>
<td>Formed Semi-solid</td>
<td>Formed Soft</td>
<td>Unformed Loose or paste-like</td>
<td>Unformed Liquid ≤ mucous</td>
<td>Unformed Liquid ≥ mucous</td>
</tr>
<tr>
<td><strong>Diarrhea</strong></td>
<td>No stool produced</td>
<td>Delayed ≥ 3 days</td>
<td>Delayed ≥ 3 days</td>
<td>Pr's Usual</td>
<td>Pr's Usual</td>
<td>Pr's Usual</td>
<td>Usual or Frequent</td>
<td>Frequent</td>
<td>Frequent</td>
</tr>
<tr>
<td><strong>Unable to defecate despite maximal effort or straining</strong></td>
<td>Major effort or straining required to defecate</td>
<td>Moderate effort or straining required to defecate</td>
<td>Minimal or no effort required to defecate</td>
<td>Minimal or no effort to defecate</td>
<td>Minimal or no effort required to defecate</td>
<td>Mod. effort required to control urgency</td>
<td>Very difficult to control urgency &amp; may be explosive</td>
<td>Incontinent or explosive - unable to control or unaware</td>
<td></td>
</tr>
</tbody>
</table>

Source: Victoria Hospice Society (2004) (online) Available at:

### Appendix 6 Constipation Assessment Scale

<table>
<thead>
<tr>
<th>Table 5.1 The Constipation Assessment Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>Abdominal distension or bloating</td>
</tr>
<tr>
<td>Change in amount of gas passed rectally</td>
</tr>
<tr>
<td>Less frequent bowel movements</td>
</tr>
<tr>
<td>Oozing liquid stool</td>
</tr>
<tr>
<td>Rectal fullness or pressure</td>
</tr>
<tr>
<td>Rectal pain with bowel movements</td>
</tr>
<tr>
<td>Small volume of stool</td>
</tr>
<tr>
<td>Unable to pass stool</td>
</tr>
</tbody>
</table>

None scores 0; Some scores 1; Severe scores 2
Total out of 16

Appendix 7 Reckitt & Benckiser Constipation Guidelines

Constipation Management Guidelines

Documentation

Constipation Management Guidelines

These guidelines have been developed to assist health care professionals to provide consistent, accessible, and accurate information on the management of constipation and are intended for use in conjunction with the patient.

Managing Flowchart

Acute Care

Chronic Care

Constipation Management Guidelines

**Diagnosis**

- 

**Lifestyle**

- The patient should be encouraged to:
  - Drink at least 8 glasses (30 oz) of fluid daily (optimal intake of carbohydrate
  - Increase fiber intake
  - Eat more fruit (daily, 1/2 cup)
  - Choose a range of foods e.g. fruit, vegetables, whole grain bread
  - 

**Medication**

- Medication should be prescribed only when necessary

**Sponsored by an undisclosed source (Reckitt Benckiser Healthcare)**

Published June 2000. T114-04

Reference


With laxatives (National Prescribing Centre, 2004). A short course of laxatives is usually enough to alleviate symptoms, and the focus should then be on preventing recurrence using the strategies outlined in Table 1.

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Appendix 8 Selected Diseases & Conditions known to be associated with constipation

<table>
<thead>
<tr>
<th>Selected Diseases and Conditions Known to be Associated with Constipation</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Body Systems</strong></td>
</tr>
<tr>
<td>Cardiovascular</td>
</tr>
<tr>
<td>Endocrine</td>
</tr>
<tr>
<td>Gastrointestinal</td>
</tr>
<tr>
<td>Psychological</td>
</tr>
<tr>
<td>Metabolic</td>
</tr>
<tr>
<td>Neurological</td>
</tr>
<tr>
<td>Renal</td>
</tr>
<tr>
<td>Other</td>
</tr>
</tbody>
</table>

### Table 1

**Drugs that may induce constipation**

<table>
<thead>
<tr>
<th>Class</th>
<th>Agent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Analgesic</td>
<td>Nonsteroidal anti-inflammatory agents</td>
</tr>
<tr>
<td>Antacid</td>
<td>Bismuth subsalicylate (Pepito-Bismol®)</td>
</tr>
<tr>
<td>Anticholinergic</td>
<td>Calcium and aluminum compounds</td>
</tr>
<tr>
<td>Anticonvulsant</td>
<td>Benzotropine (Cogentin®)</td>
</tr>
<tr>
<td>Antidepressant</td>
<td>Carbamazepine (Equetro® and others)</td>
</tr>
<tr>
<td>Antihistamine</td>
<td>Monoamine-oxidase inhibitors</td>
</tr>
<tr>
<td>Antimotility</td>
<td>Tricyclic amitriptyline</td>
</tr>
<tr>
<td>Antimuscarinic</td>
<td>Diphenhydramine (Benadryl® and others)</td>
</tr>
<tr>
<td>Antitussive</td>
<td>Diphenoxylate (Lomotil®)</td>
</tr>
<tr>
<td>Diarrhoea</td>
<td>Loperamide (Imodium®)</td>
</tr>
<tr>
<td>Antispasmodic agents</td>
<td>Oxybutynin (Ditropan®)</td>
</tr>
<tr>
<td>Antimucous</td>
<td>Tolteradine (Detro®)</td>
</tr>
<tr>
<td>Antiseptic</td>
<td>Alprazolam (Xanax®)</td>
</tr>
<tr>
<td>Antiviral</td>
<td>Verapamil (Calan® and others)</td>
</tr>
<tr>
<td>Antibacterial</td>
<td>Thiazide type</td>
</tr>
<tr>
<td>Antifungal</td>
<td>Trimethaphan camsylate (Afronad®)</td>
</tr>
<tr>
<td>Antituberculosis</td>
<td>Cholestyramine (Prevalite®)</td>
</tr>
<tr>
<td>Antiallergic</td>
<td>Pravastatin (Pravachol®)</td>
</tr>
<tr>
<td>Antimigraine</td>
<td>Simvastatin (Zocor®)</td>
</tr>
<tr>
<td>Antimicrobial</td>
<td>Cyclobenzaprine (Flexeril®)</td>
</tr>
<tr>
<td>Antihypertensive</td>
<td>Metaxalone (Skelaxin®)</td>
</tr>
<tr>
<td>Antihistaminic</td>
<td>Codeine</td>
</tr>
<tr>
<td>Antihypertensive</td>
<td>Morphine</td>
</tr>
<tr>
<td>Antihistaminic</td>
<td>Carbamazepine (Equetro® and others)</td>
</tr>
<tr>
<td>Antihistaminic</td>
<td>Levodopa (Dopar®)</td>
</tr>
<tr>
<td>Antihistaminic</td>
<td>Phenothiazines</td>
</tr>
<tr>
<td>Antihistaminic</td>
<td>Phenobarbital (Luminal®)</td>
</tr>
<tr>
<td>Antihistaminic</td>
<td>Zolpidem (Ambien®)</td>
</tr>
<tr>
<td>Antihistaminic</td>
<td>Barium sulfate</td>
</tr>
<tr>
<td>Antihistaminic</td>
<td>Iron</td>
</tr>
<tr>
<td>Antihistaminic</td>
<td>Memantine (Namenda®)</td>
</tr>
<tr>
<td>Antihistaminic</td>
<td>Phentolamine (Nardil®)</td>
</tr>
<tr>
<td>Antihistaminic</td>
<td>Sucralfate (Carafate®)</td>
</tr>
<tr>
<td>Antihistaminic</td>
<td>Vinca alkaloids (Oncovin®)</td>
</tr>
</tbody>
</table>

*Note. Adapted from Hohl (2008) and Batawaz (2011).*

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Appendix 10 Bowel Function Diary

### Appendix 11 Barthel Index

**THE BARTHEL INDEX**

<table>
<thead>
<tr>
<th>Activity</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>FEEDING</td>
<td></td>
</tr>
<tr>
<td>0 = unable</td>
<td></td>
</tr>
<tr>
<td>5 = needs help cutting, spreading butter, etc., or requires modified diet</td>
<td></td>
</tr>
<tr>
<td>10 = independent</td>
<td></td>
</tr>
<tr>
<td>RATHING</td>
<td></td>
</tr>
<tr>
<td>0 = dependent</td>
<td></td>
</tr>
<tr>
<td>5 = independent (or in shower)</td>
<td></td>
</tr>
<tr>
<td>GROOMING</td>
<td></td>
</tr>
<tr>
<td>0 = needs to help with personal care</td>
<td></td>
</tr>
<tr>
<td>5 = independent (face/hair/teeth/shaving (implements provided))</td>
<td></td>
</tr>
<tr>
<td>DRESSING</td>
<td></td>
</tr>
<tr>
<td>0 = dependent</td>
<td></td>
</tr>
<tr>
<td>5 = needs help but can do about half unaided</td>
<td></td>
</tr>
<tr>
<td>10 = independent (including button, zip, lace, etc.)</td>
<td></td>
</tr>
<tr>
<td>BOWELS</td>
<td></td>
</tr>
<tr>
<td>0 = incontinent (or needs to be given enemas)</td>
<td></td>
</tr>
<tr>
<td>5 = occasional accident</td>
<td></td>
</tr>
<tr>
<td>10 = continent</td>
<td></td>
</tr>
<tr>
<td>BLADDER</td>
<td></td>
</tr>
<tr>
<td>0 = incontinent, or catheterized and unable to manage alone</td>
<td></td>
</tr>
<tr>
<td>5 = occasional accident</td>
<td></td>
</tr>
<tr>
<td>10 = continent</td>
<td></td>
</tr>
<tr>
<td>TOILET USE</td>
<td></td>
</tr>
<tr>
<td>0 = dependent</td>
<td></td>
</tr>
<tr>
<td>5 = needs some help, but can do normal things alone</td>
<td></td>
</tr>
<tr>
<td>10 = independent (on and off, dressing, wiping)</td>
<td></td>
</tr>
<tr>
<td>TRANSFERS (BED TO CHAIR AND BACK)</td>
<td></td>
</tr>
<tr>
<td>0 = unable, no sitting balance</td>
<td></td>
</tr>
<tr>
<td>5 = major help (one or two people, physical), can sit</td>
<td></td>
</tr>
<tr>
<td>10 = minor help (verbal or physical)</td>
<td></td>
</tr>
<tr>
<td>15 = independent</td>
<td></td>
</tr>
<tr>
<td>MOBILITY (ON LEVEL SURFACES)</td>
<td></td>
</tr>
<tr>
<td>0 = immobile or &lt; 50 yards</td>
<td></td>
</tr>
<tr>
<td>5 = wheelchair independent, including courses, &gt; 50 yards</td>
<td></td>
</tr>
<tr>
<td>10 = walks with help of one person (verbal or physical) &gt; 50 yards</td>
<td></td>
</tr>
<tr>
<td>15 = independent (not may use any aid, for example, stick) &gt; 50 yards</td>
<td></td>
</tr>
<tr>
<td>STAIRS</td>
<td></td>
</tr>
<tr>
<td>0 = unable</td>
<td></td>
</tr>
<tr>
<td>5 = needs help (verbal, physical, carrying aid)</td>
<td></td>
</tr>
<tr>
<td>10 = independent</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL (0–100):** __________

Source: Mahoney FI, Barthel D. “Functional evaluation: the Barthel Index.”

Maryland State Medical Journal 1965;14:56-61
Appendix 12 Interview Schedule

- Do you have a policy on Constipation?
- How do you screen for constipation?
- How is this condition prevented?
- How many residents do you have in our nursing home?
- How many were within the inclusion criteria?
- How many gave their consent to participate?
Appendix 13: Confirmation of Ethical Approval

10th October, 2013.

Dear [Name],

The Research Ethics Committee considered your research proposal examining the prevalence and causes of chronic constipation in Nursing Homes. The study was approved. I would like to clarify if there is any pharmaceutical industry funding for the Gerontology Research Nurse. The Committee wished you every success in this important and timely study.

Warmest regards,

Yours sincerely,

[Signature]

Chairman,
Research Ethics Committee
Certificate of Research Ethics Committee Approval

Date: 4th October, 2013

To: Consultant Surgeon

From: Consultant Histopathologist, Chairman, Research Ethics Committee

Protocol title: Cross-sectional prevalence study of constipation, causative factors and laxative use in Irish Nursing Home Residents.

The Research Ethics Committee approved human subject involvement in your research project on 4th October, 2013.

There is no expiration date for this approval, but the protocol must be reviewed by the Ethics Committee before December 31st 2015. If this project is to continue beyond that date, please submit an updated proposal one month prior to the expiration date. If this proposal is used in conjunction with any other human experimentation or if it is modified in any way, it must be re-approved for these special circumstances.

Note that the following should be reported to the Ethics Committee: 1) all serious adverse events, occurring at this institution, regardless of whether or not they are thought to be study related should be reported within 2 business days to one of the members of the Research Ethics Committee, 2) any unanticipated problems, and/or 3) and injuries to subjects enrolled.

Please remember that all data including all consent form documents must be retained for a minimum of three years past the completion of the research. Additional requirements may be imposed by your funding source, your department, or other entities. This institution protects personal health information of human subjects.

Chairman Research Ethics Committee

Appendix 14 Letter of Information for Director of Nursing
INFORMATION LEAFLET

FOR THE ATTENTION OF THE NURSING DIRECTOR AT: xxxxxxxxxxxx

DATE: 26th January 2014

As you are aware we are hoping to conduct a research study within your nursing home. In this leaflet we have highlighted some of the main points of the study. We hope that from this we can give explanation of the reasons for this study, outlining what information we hope to capture, how we intend to capture this information and most importantly, how the findings of this study will be used to advise research and hopefully provide for a positive impact on the quality of life of the individuals experiencing the effects of this condition.

Hopefully this will help you to inform your patients who may wish to participate in the study. If there are any other questions or information that you may need please do not hesitate to contact any many of the research team named below.

The title of this study is

"A cross-sectional study of prevalence of constipation and laxative use in the nursing home".

The reason for this study is to determine how common a problem constipation is in nursing home residents, what the underlying medical issues are that might make constipation more common in this population and what medical treatments currently in use (if any) are effective.
The team would like permission to review each participant’s medical and nursing notes in the nursing home to gather information for the study. This information will be recorded securely and will only be available to the research team who will destroy all details on completion of the research. With your permission, the researcher will be calling in person to your nursing home to introduce herself to you and make arrangements to collect the necessary information. Her contact number is provided. These personal records will only be accessed by the research team with permission of the participant (These consent forms have already been sent to you) Please let any member of the team know if you have not yet received these.

The results of these investigations, we hope will allow to see not only how constipation effects Everyday life but will be also let us view how other underlying conditions effect constipation and hopefully allow us to see how this condition might be better managed.

Participants will not be required to participate in any further investigations, give blood tests or have any further examinations as a result of this study. There are no experimental treatments or new medications given to patients participating in this study
Appendix 15 Study Poster

We would like to invite you to participate in a study of a common problem that can have huge impact on the health of an older person.

This condition is chronic constipation.

Your nursing home is participating in this important research. The nursing staff will be asking for your consent for the research team to review your medical and nursing notes.

This is an Irish Research Study

We hope the results of these investigations will allow us to see how constipation effects everyday life and will be let us view how other underlying conditions affect constipation and allow us to see how this condition might be better managed.

You will not be required to participate in any further investigations, give blood tests or have any further examinations as a result of this study. There are no experimental treatments or new medications given to patients participating in this study.

IF YOU FEEL YOU CAN HELP US IN THIS RESEARCH PLEASE INFORM ANY MEMBER OF THE NURSING STAFF

THANK YOU
Appendix 16 Patient Consent Form
THANK YOU FOR CONSIDERING TAKING PART IN THIS RESEARCH STUDY

CONSENT FORM

Reference Number:

Title of Research Study: Cross-sectional prevalence study of constipation, causative factors and laxative use in Irish Nursing Home

Patient Name:

Name of Doctor and Telephone Number:

1. I confirm that I have read and understood the information leaflet dated........ for the above research study and received an explanation of the nature, purpose, duration, and foreseeable effects and risks of the research study and what my involvement will be

2. I have had time to consider whether to take part in this research study. My questions have been answered satisfactorily and I have received a copy of the Patient Information Leaflet

3. I understand that my participation is voluntary (my choice) and that I am free to withdraw at any time without my medical care or legal rights being affected

5. I understand that my General Practitioner Dr............................... will be informed by Dr ......................... that I am taking part in this research study

8. I am willing to allow access to my medical records by representatives of the research team but understand that strict confidentiality will be maintained.

9. I agree to take part in the above research study

................................................. .................................................
................................................. .................................................

Name of Patient (in block letters) Date Signature

................................................. .................................................
................................................. .................................................

185
<table>
<thead>
<tr>
<th>Name of Person taking consent</th>
<th>Date</th>
<th>Signature</th>
</tr>
</thead>
<tbody>
<tr>
<td>(If different from doctor/researcher)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Researcher | Date | Signature

1 copy for patient, 1 copy for researcher, 1 copy to be inserted in hospital notes
## Appendix 17 Bespoke Data Collection Instrument

<table>
<thead>
<tr>
<th>Nursing Home Details</th>
<th>Auditor Details</th>
<th>Initials</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nursing Home:</td>
<td>Review:</td>
<td></td>
</tr>
<tr>
<td>Patient Number:</td>
<td>Verified By:</td>
<td></td>
</tr>
</tbody>
</table>

If the answer is ‘N’ to any of the questions in Section 1a below, then this resident cannot be included in the study as the resident does not meet inclusion criteria.

### SECTION 1a: INCLUSION CRITERIA

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Guidance Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 60 years old</td>
<td>Circle ‘Y’ if the patient is over 60 years old and ‘N’ if the patient is not over 60 years old</td>
</tr>
<tr>
<td>Regular/PRN Laxative Use</td>
<td>Circle ‘Y’ uses laxatives on a regular or PRN basis and ‘N’ if the patient does not use laxatives</td>
</tr>
<tr>
<td>Resident in Nursing Home ≤ 6 weeks</td>
<td>Circle ‘Y’ if the resident has been in the nursing home for greater than 6 weeks and ‘N’ if the resident has not been in the nursing home for greater than 6 weeks</td>
</tr>
</tbody>
</table>

If the answer is ‘Y’ to any of the questions in Section 1b, then this resident cannot be included in the study as the resident meets exclusion criteria.

### SECTION 1b: EXCLUSION CRITERIA

<table>
<thead>
<tr>
<th>Criteria</th>
<th>Guidance Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Does the resident have any known organic GI diseases listed below that could be related to Constipation</td>
<td>Please circle ‘Y’ if the resident has a known current malignancy or ‘N’ if this is not the case</td>
</tr>
<tr>
<td>Malignancy</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Condition</td>
<td>Code</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Stricture/Stenosis</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Inflammatory Bowel Disease</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
<tr>
<td>Intestinal Resection</td>
<td>Y</td>
</tr>
<tr>
<td></td>
<td>N</td>
</tr>
</tbody>
</table>

**SECTION 2: GENERAL PATIENT DEMOGRAPHICS**

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td>Input the patients age in years</td>
</tr>
<tr>
<td>Gender</td>
<td>Circle ‘M’ for male; ‘F’ for female</td>
</tr>
<tr>
<td>Weight</td>
<td></td>
</tr>
<tr>
<td>Height</td>
<td>If not available, use arm circumference or most recent BMI</td>
</tr>
<tr>
<td>Somatic Disease-SK?</td>
<td>Circle ‘Y’ for Yes; ‘N’ for No</td>
</tr>
<tr>
<td>Psychiatric Disease</td>
<td>Circle ‘Y’ for Yes; ‘N’ for No</td>
</tr>
</tbody>
</table>

**SECTION 5b: SELECTED MEDICATIONS ASSOCIATED WITH CONSTIPATION**

<table>
<thead>
<tr>
<th>Class of Medication</th>
<th>Guidance: Place an ‘X’ to indicate of the resident is treated with any classes of medication below</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Place an ‘X’ where appropriate</td>
</tr>
</tbody>
</table>

188
Non-prescription drugs
Antacids (calcium containing)
Calcium supplements
Iron
Antidiarrheal agents
Nonsteroidal anti-inflammatory agents
Prescription drugs
Anticholinergic drugs
Antiparkinsonian drugs
Antipsychotics
Antihistamine
Calcium channel blocker
Diuretics-
Sympathomimetics
Tricyclic antidepressants
Opiates

<table>
<thead>
<tr>
<th>SECTION6: SELECTED DISEASES AND CONDITIONS ASSOCIATED WITH CONSTIPATION</th>
<th>GUIDANCE: PLACE AN 'X' TO INDICATE THE CONDITION(S) THE RESIDENT MAY SUFFER FROM</th>
</tr>
</thead>
<tbody>
<tr>
<td>BODY SYSTEM</td>
<td>DISEASE/CONDITION</td>
</tr>
<tr>
<td>Cardiovascular</td>
<td>Congestive Heart Failure</td>
</tr>
<tr>
<td></td>
<td>Ischaemic Heart Disease</td>
</tr>
<tr>
<td></td>
<td>Hyperparathyroidism</td>
</tr>
<tr>
<td>Endocrine</td>
<td>Diabetes Mellitus</td>
</tr>
<tr>
<td></td>
<td>hypothyroidism</td>
</tr>
<tr>
<td>Gastrointestinal</td>
<td>Colon neoplasia</td>
</tr>
<tr>
<td>-----------------</td>
<td>----------------</td>
</tr>
<tr>
<td></td>
<td>Diverticular Disease</td>
</tr>
<tr>
<td></td>
<td>or Diverticulitis</td>
</tr>
<tr>
<td></td>
<td>Obstructing neoplasms</td>
</tr>
<tr>
<td></td>
<td>Painful lesions in the rectal or anal region</td>
</tr>
<tr>
<td></td>
<td>Hemorrhoids</td>
</tr>
<tr>
<td></td>
<td>Fissures</td>
</tr>
<tr>
<td></td>
<td>Perirectal Abscesses</td>
</tr>
<tr>
<td>Psychological</td>
<td>Dementia</td>
</tr>
<tr>
<td></td>
<td>Psychosis</td>
</tr>
<tr>
<td></td>
<td>Symptoms of depression</td>
</tr>
<tr>
<td>Metabolic</td>
<td>Acidosis</td>
</tr>
<tr>
<td></td>
<td>Chronic Kidney Disease</td>
</tr>
<tr>
<td></td>
<td>Diabetes</td>
</tr>
<tr>
<td></td>
<td>Electrolyte Imbalance</td>
</tr>
<tr>
<td></td>
<td>Hypercalcemia</td>
</tr>
<tr>
<td></td>
<td>Hypokalemia</td>
</tr>
<tr>
<td></td>
<td>Hyperparathyroidism</td>
</tr>
<tr>
<td></td>
<td>Hypothyroidism</td>
</tr>
<tr>
<td></td>
<td>Scleroderma</td>
</tr>
<tr>
<td>Neurological</td>
<td>Amyotrophic sclerosis</td>
</tr>
<tr>
<td>Renal</td>
<td>Multiple sclerosis</td>
</tr>
<tr>
<td>-------</td>
<td>-------------------</td>
</tr>
<tr>
<td></td>
<td>Myotonic dystrophy</td>
</tr>
<tr>
<td></td>
<td>Parkinson's Disease</td>
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<td></td>
<td>Stroke</td>
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<tr>
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<td>Dementia - current MMSE</td>
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<td>Depression</td>
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<td></td>
<td>Chronic renal failure</td>
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<tr>
<td>Other</td>
<td>Debilitating physical conditions</td>
</tr>
<tr>
<td></td>
<td>Spinal cord injury</td>
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