Reducing the Waiting List for New Referrals to the ENT Outpatient Department

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Declaration Form

I declare that this dissertation, which I submit to RCSI for examination in consideration of the award of a higher degree MSc Physician Associate Studies, 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.

Signed:

Date:
Acknowledgements:

There are a number of people without whom this dissertation would not have been possible:

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Abstract:

Lengthy outpatient waiting lists are a global healthcare concern affecting most hospital specialities, including in Ireland. The result is a delay in treatment and suboptimal outcomes for newly referred patients. Simultaneously, patients requiring long-term follow-up care exist amid this overburdened system. Data collection showed that in December 2017, 3,944 patients were waiting for a first time appointment within the ENT service of a large urban teaching hospital in Dublin. Of these, 766 were waiting to be seen by just one consultant and a total of 399 were waiting for more than 52 weeks. Of the 882 patients who were seen by the consultant between January and December 2017, only 252 were new referrals. These figures highlight the large proportion of return patients attending ENT outpatient services. This quality improvement project plan concentrates on an effort to improve waiting times for new patients by the creation of a non-physician-led ‘microsuction clinic’, which aims to streamline patients requiring regular care within the ENT department. Quality improvement tools including a driver diagram and an Ishikawa diagram were used to establish the root of the problem. With guidance of the DMAIC framework, the anticipated result could be a 46% reduction in the number of patients waiting more than twelve months, within one year of the projects implementation. Simultaneously, return patients could benefit from improved continuity of care and faster access to outpatient follow-up appointments.
List of Abbreviations:

CSOM – Chronic Suppurative Otitis Media
CWD – Canal Wall Down Mastoidectomy
CWU – Canal Wall Up Mastoidectomy
ENT – Ear, Nose and Throat
HIPE – Hospital Inpatient Enquiry
HSE – Health Service Executive
MAT – Microsuction Aural Toilet
NCHD – Non-Consultant Hospital Doctor
OPD – Outpatient Department
PA – Physician Associate
QI – Quality Improvement
QIP – Quality Improvement Project
# Table of Contents:

1.0 Introduction ......................................................................................................................... 1
  1.1 Introduction ............................................................................................................................. 2
  1.2 Organisational Context .......................................................................................................... 2
  1.3 Rationale for Quality Improvement Project ............................................................................. 3
  1.4 Aim & Objectives .................................................................................................................... 5
    1.4.1 Aim .................................................................................................................................. 5
    1.4.2 Objectives ......................................................................................................................... 6
  1.5 The Role of the Student in the Organisation and Project ......................................................... 6
  1.6 Summary ................................................................................................................................ 7

2.0 Literature Review .................................................................................................................... 8
  2.1 Introduction ............................................................................................................................. 9
  2.2 Search Strategy ....................................................................................................................... 9
  2.3 Review of Themes .................................................................................................................. 10
    2.3.1 Quality of Care in Health ................................................................................................. 10
    2.3.2 Long-term Follow-up after Mastoidectomy Surgery ......................................................... 14
    2.3.3 Non-Physician-Led Outpatient Clinics ............................................................................. 17
  2.4 Implications for the Project ..................................................................................................... 19
  2.5 Summary ................................................................................................................................ 20

3.0 Methodology .......................................................................................................................... 22
  3.1 Introduction ............................................................................................................................. 23
  3.2 Approaches to Quality Improvement ....................................................................................... 23
  3.3 Rationale for Model Selected ................................................................................................ 28
  3.4 Model Overview ..................................................................................................................... 29
    3.4.1 Define Phase ....................................................................................................................... 29
    3.4.2 Measure Phase ................................................................................................................... 33
    3.4.3 Analyse Phase ................................................................................................................... 35
    3.4.4 Improve Phase ................................................................................................................. 40
  3.5 Summary ................................................................................................................................ 44
List of Figures:

Figure 1: IHI PDSA Cycle.................................................................24
Figure 2: Pillars of Quality of Care in Irish Healthcare..........................25
Figure 3: Drivers and Framework for Improving Quality..........................26
Figure 4: The Lean Principles...............................................................27
Figure 5: Stakeholder Analysis.............................................................30
Figure 6: Process Flow Map of New and Returning Patients Attending ENT OPD...31
Figure 7: Driver Diagram...................................................................32
Figure 8: ENT OPD Waiting List Data 2017...........................................35
Figure 9: ENT OPD New and Return Patients 2017..................................36
Figure 10: Adult Patients Attending ENT OPD 01/02/18 – 19/04/18..............37
Figure 11: Fishbone Diagram...............................................................39
Figure 12: The 5 Whys......................................................................40
Figure 13: Return Patient Diagnoses 01/02/18 – 19/04/18..........................47
Figure 14: New Patient Diagnoses 01/02/18 – 19/04/18...........................60

List of Tables:

Table 1: Breakdown of Procedures Carried out in ENT OPD in 2017............38
Table 2: Regular ENT Clinic Schedule 2017-2018........................................41
Table 3: Data Collected During Pilot Mastoidectomy Clinic.........................42
1.0 Introduction
1.1 Introduction

Every year in Ireland, waiting lists for first-time outpatient appointments continue to grow. Patients with critical needs are regularly prioritised over non-urgent new or returning patients, resulting in longer wait times for many (HSE, 2016a). Extensive waiting times result in delayed treatment and, in some cases, negative outcomes for patients and their care (RCSE, 2017). This quality improvement project (QIP) plan addresses the problem of long waiting lists for new referrals to the ear, nose and throat (ENT) outpatient department (OPD) in a teaching hospital in Dublin. The following section will outline the project’s organisational context, followed by its rationale, aim and objectives. The role of the student within the QIP will be discussed and finally, a summary will conclude the chapter.

1.2 Organisational Context

With 820 beds and over 3000 employees, the project site is one of Ireland’s largest urban hospitals. According to the hospital’s statistical database, it serves a community of over 300,000 patients. The hospital has a 24-hour emergency department and employs consultants across 54 specialties. It is a major teaching hospital affiliated with the Royal College of Surgeons in Ireland. Known as the National Centre for Cochlear Implantation, it also serves as the Regional Ear, Nose and Throat Centre (CRA, 2015). Due to this, the hospital has a responsibility to a large number of patients with ENT complaints.

There are six consultants employed by the hospital’s otolaryngology directorate, four of whom concentrate their expertise on general ENT surgery. In 2017, the ENT department carried out 5,960 surgical procedures, of which 1,167 were in-patient
procedures. In the OPD, 11,696 patients were seen and 57.7% of these were return patients (Beaumont Hospital, 2016). The ENT department runs operating theatres Monday through Friday and outpatient clinics five days per week. Although the service operates a busy schedule, there are still a substantial number of new patients waiting to be seen by consultants, as well as patients waiting to attend follow-up appointments. According to the department’s access office, 3,944 patients were waiting for new appointments within the specialty by December 2017. Of these, 35% were waiting for over 52 weeks, meaning that the hospital has fallen short of the national target of 15% (HSE, 2018).

1.3 Rationale for Quality Improvement Project
An ageing population means that already lengthy outpatient waiting lists will continue to grow. The number of people in Ireland aged over 65 is expected to double by 2026 and triple by 2046 (HSE, 2016a). Despite numerous national strategies to address the increasing demand, Irish outpatient waiting lists have been growing at a rapid rate year after year. In 2015, 3.2 Million patients in Ireland attended outpatient appointments, including one million new patients and 2.2 million review patients. There were 375,440 patients waiting for a first time OPD appointment (HSE, 2017a). Since then, the waiting list has increased even more. According to the National Treatment Purchase Fund (NTPF, 2017), there were 500,800 patients waiting across Ireland by the end of 2017. Of these, 138,078 (28%) were waiting for more than 52 weeks despite the national target of 15% or less (HSE, 2017b). Of the more than half a million patients waiting for an appointment nationally, 14% were awaiting an appointment within the ENT service (NTPF, 2017).
Following discussion with the project’s sponsor, a consultant ENT surgeon, the waiting list for newly referred ENT patients was chosen as an area for improvement. The sponsor and other consultants working within the department describe long waiting lists and high volumes of returning patients, including those receiving long-term follow-up, as recurrent issues. The frequent changeover of Non-Consultant Hospital Doctors (NCHDs) and general understaffing have also been described as obstacles to continuity of care and efficiency. Furthermore, research carried out by the hospital’s Patient Advisory Liaison Service found that of the ‘HSE 8 Pillars of Care’, patients complained most about access to care. Specific areas for improvement included delays in admission, appointment delays and a lack of resources (Beaumont Hospital, 2016).

From observation, the department runs a busy service including daily outpatient procedures. Many patients who attend the ENT OPD, either new or returning, require regular or once-off intervention. According to the consultant, procedures regularly performed include:

- Microsuction Aural Toilet (MAT)
- Nasopharyngoscopy / Sinoscopy
- Laryngoscopy / Fiberoptic Examination of the Pharynx (FEP)
- Aspiration of Peritonsillar Abscess
- Nasal Cautery / Control of Epistaxis
- Change of Tracheostomy Tube
- Removal of Foreign Body from Nose and Ear / Internal Nasal Splints
Patients requiring MAT often have cerumen impaction, have undergone mastoidectomy surgery or suffer with Chronic Suppurative Otitis Media (CSOM). The consultant suggested that this can be time consuming, especially for NCHDs, and can lead to longer consultation times than necessary. These prolonged appointments can cause delays within the department.

1.4 Aim & Objectives

1.4.1 Aim

The proposed area for improvement of this QIP was presented at the hospital’s weekly quality improvement (QI) session, Lunch and Learn. These meetings are intended to optimise interdisciplinary healthcare education and collaboration and thus aim to facilitate QI within the organisation (McNamara et al., 2016). As a result of the presentation, the aim of this project was refined to the following:

To reduce the number of newly referred patients waiting for a first appointment with one general ENT consultant for more than 52 weeks by 50% within two years.
1.4.2 Objectives

The objectives of the QIP were to:

- Investigate the number of new patients waiting for an appointment with one consultant, by liaising with the hospital’s access office, by February 2018.
- Identify the largest cohort of returning patients seen in clinic, by diagnosis, via an OPD questionnaire completed by the consultant after each clinic for a duration of thirteen weeks, by May 2018.
- Quantify how many patients had treatment at the time of their appointment, specifically MAT, by liaising with the hospital’s coding department and ENT OPD, by May 2018.
- Design an intervention to reduce the wait time for new patients waiting longer than 52 weeks by May 2018.
- Pilot an intervention in the hospital’s ENT department by May 2018.

1.5 The Role of the Student in the Organisation and Project

As a student of the MSc in Physician Associate (PA) Studies, I spent a total of six weeks in the ENT department as part of my clinical rotations. I was attached to the service for three weeks during my first year and a further three weeks during my second year. As a student, my role within the organisation was to develop my knowledge base and skill set as it related to the specialty by acting as an observer and a learner. I was able to shadow both consultants and NCHDs and participate by practicing history taking and physical examination skills under supervision.

As a student, I was able to act as an observer and witness the department’s process from an outside perspective. I was able to shadow patients and doctors in the
context of this QIP in order to explore the root causes of the problem. I was able to liaise with various departments involved with the specialty, such as the coding, access and hospital inpatient enquiry (HIPE) departments. My low ranking on the medical hierarchy meant that I required support from a team, which was established with the help of a stakeholder analysis. As the project lead, I worked closely with the QI team and the consultant, as the project’s sponsor, on an ongoing basis. My role also involved using a variety of QI tools to investigate the problem and collecting data to support an improvement.

1.6 Summary

This chapter provided a brief introduction to the organisational context of this QIP and a background to one of the biggest problems it faces, namely waiting list times for new ENT patients. The rationale for this project was presented before its aim and objectives were outlined. Finally, the role of the student in the organisation and the project was explained. The next chapter provides a literature review in support of the QIP.
2.0 Literature Review
2.1 Introduction

In this chapter, literature in support of the QIP is reviewed. The search strategy for relevant literature is presented and results of this search are categorised into three themes. These themes are discussed before the chapter concludes with a summary of the findings from the literature and their implication for this QIP.

2.2 Search Strategy

A broad search was conducted via PubMed using the phrase ‘long-term follow-up ENT’. This search was limited to five years and yielded over 500 results and four studies were suitable. Next, a MeSH search including the terms ‘mastoidectomy’, ‘approach’, ‘complications’ and ‘follow-up’ was performed and an additional four studies and one commentary were selected. The search was then extended by five years and one additional study was included due to its continued relevance. A seminal audit, over twenty years old, was also included. Terms such as ‘nurse-led’, ‘ent clinic’ ‘otology clinic’, ‘physician associate’, ‘physician assistant’ and ‘rapid access’ were combined and searched. Multiple results were found and five studies from the last five years were deemed relevant. After further extending the search, one fourteen-year-old study was also included due to its relevance. Ten Irish and two UK government documents were included. A total of seventeen international studies from the UK, France, Sweden, Canada, the United States and India were included. Finally, a Taiwanese commentary, an Irish guideline and a UK abstract were also included due to their significance.
2.3 Review of Themes

After reviewing the literature, three themes emerged: ‘quality of care in health’, ‘long-term follow-up after mastoidectomy surgery’ and ‘non-physician led outpatient clinics’. The first theme examines what is meant by quality in the context of healthcare and the issues that challenge its provision. The problem of waiting lists and related recommendations and targets are discussed. The second theme focuses on the speciality of otolaryngology and the need for continued follow-up for a proportion of patients under the speciality, particularly those who have undergone mastoidectomy surgery. The last theme investigates the use of non-physician healthcare professionals, such as PAs and nurses, for the improvement of quality in healthcare.

2.3.1 Quality of Care in Health

The World Health Organisation describes quality of care as the degree to which healthcare services provided to patients improve outcomes (WHO, 2018). The Health Service Executive (HSE) states in its annual National Service Plan that delivering high quality care to patients encompasses care that is safe, effective, person-centered, timely, efficient and equitable (HSE, 2018). Similarly, the Health Information and Quality Authority (HIQA) categorises quality of care into four domains: person-centered care, effectiveness, safety and better health and wellbeing (HIQA, 2012). The HSE (2016) outlines a framework for improving quality in healthcare, which aims to improve patient outcomes and experiences as well as staff development and support. It emphasises that continuity of care is vital for every
service user to ensure that no person or part of their treatment falls through gaps in the provision of services (HSE, 2016a).

In 2017, the National Patient Experience Survey was conducted by the HSE, HIQA and the Department of Health across 40 Irish hospitals in order to assess the experience of 13,706 patients attending acute services (HSE, 2017c). Although feedback was predominantly positive, 1,907 (16%) patients felt that their quality of care was only ‘fair’ or ‘poor’. Areas of improvement arising from the survey included communication, discharge information, waiting times and staffing levels, highlighting the need for a more person-centred approach to care.

Sláintecare, a vision for a new health service in Ireland, was published in 2017 and aims to be implemented over the next ten years (Houses of the Oireachtas, 2017). The document is a first for political consensus on a national health reform strategy. Outpatient waiting times are a recurring issue throughout the report. The report highlights that waiting lists for access to outpatient appointments ultimately cost lives and cause injury to patients and thus suggests that the priority should be to conclusively address the issue. The report concludes that no patient should wait more than ten weeks for an outpatient appointment. The National Service Plan however focuses on reducing the list for patients waiting over 52 weeks (HSE, 2018). The expected target by the end of this year is that less than or equal to 20% of patients will be waiting for 52 weeks or more. With the original target being set to 15% last year (HSE, 2017b), the outturn was actually 25.7% (HSE, 2018). Barriers to success of the plan included a lack of funding and inadequate staffing levels (HSE, 2018).
Similarly, the United Kingdom set out the 18-Week Referral to Treatment Target, which aims to enable 92% of patients to be seen within 18 weeks of referral (NHS, 2012). This was in response to the NHS’s constitution and patient experience and safety impacts outlined by the Royal College of Surgeons in England (2017) and the Patients Association (2016) as per whom results of long wait times may be dire. These include patients having to live with the consequences of debilitating conditions for longer, conditions deteriorating and requiring more complicated, challenging and expensive treatment as well as conditions becoming chronic and in some cases untreatable. The impact on mental health and quality of life is also emphasised. In 2017, 92% of patients were still waiting for an average of 19.5 weeks for treatment and reasons for this, similar to those within the HSE, included a lack of funding and understaffing (NHS, 2017).

In comparison, a Canadian Fraser Institute report (Barua, 2017) found that the average wait time for first appointments was 10.2 weeks when the clinically reasonable limit, according to specialists, is 7.2 weeks. In some cases patients were waiting for more than 21 weeks. Despite prior efforts to reduce wait times across the country, adverse medical consequences continued to occur as a result of prolonged wait times (Day, 2013). These include patient safety problems such as poorer medical outcomes and an increased risk of adverse events and economically, an increased cost burden (Barua, 2017).

Various approaches have been implemented in an effort to reduce waiting times in Ireland. The use of electronic referrals for General Practitioners was introduced in 2011 to help improve referrals to consultant-led clinics and reduce the length of time taken to process new referrals (HIQA, 2011). The Minister for Health established the National Treatment Purchase Fund (NTPF) in 2002 in order to reduce the waiting
time for public patients by funding their treatment in private hospitals (NTPF, 2016). As part of the National Waiting List Management Protocol (HSE, 2014), validation letters are sent to routine patients by post in order to offer those who have been waiting for some time the option to cancel an unwanted OPD appointment. The strategy has been reinforced again this year after over 416,000 patients failed to attend their OPD appointment in 2017 (HSE, 2017a). Similarly, the NTPF (2017) recommends postal validation to manage patients awaiting day case admissions or planned procedures.

The Sláintecare Report (Houses of the Oireachtas, 2017) suggests providing care outside of the hospital setting where possible, eliminating private care from the public sector, further improving referral methods and care pathways and increasing funding. It also recommends expanding the workforce, including the number of non-physician healthcare professionals employed. The Strategy for the Design of Integrated Outpatient Services 2016-2020 promotes the use of virtual, fast-track and direct-access clinics and other technological advances as well as access to care by healthcare professionals who are not doctors (HSE, 2016a).

According to the Institute of Medicine (2015), a major issue affecting access and scheduling for newly referred patients is providing the service while maintaining available appointments for returning patients. Outpatient services in Ireland saw 3.3 million patients in 2015 of which 72% were review patients (HSE, 2016a). This suggests a need for focussed care for returning patients whilst creating availability for newly referred patients awaiting first time appointments.
2.3.2 Long-term Follow-up after Mastoidectomy Surgery

A proportion of patients diagnosed with chronic illness require long-term follow-up in the OPD. This can result in a cost burden for the service provider and a significant increase in workload for OPDs, as well as disruption to patients’ lives (Maiti et al., 2016). Those affected include patients who have survived a cancer diagnosis and require on-going surveillance, particularly those who have overcome a childhood diagnosis. These patients require complex care from various specialties in the outpatient setting which can result in multiple annual visits per patient (Gan & Spoudeas, 2014). Patients with chronic medical conditions also require regular monitoring and reassessment to prevent disease progression and complications (Mair, 2014). Similarly, patients who have undergone surgery require at least one, if not multiple follow-up visits. Although surgery is curative for many conditions, some procedures, such as mastoidectomy, result in the need for further care.

The goal of mastoidectomy surgery is to fully eradicate disease, to create a dry and safe ear for the patient and to prevent recurrent disease (Wilson et al., 2013). These objectives serve to prevent serious complications of conditions such as CSOM and cholesteatoma and to improve quality of life. Although cholesteatoma is a benign condition, these collections of keratinizing squamous epithelium can be destructive to the inner ear and skull base and cause extensive, permanent damage. Surgery is usually the mainstay of treatment for cholesteatoma. There are various surgical approaches including modified techniques with tympanoplasty or mastoid obliteration, which aim to restore the anatomy and physiology of the inner ear. Two commonly used approaches remain canal wall up mastoidectomy (CWU) and canal wall down mastoidectomy (CWD). The advantages and disadvantages of these
surgical approaches have long been debated as both approaches carry risks and benefits relating to morbidity and post-operative quality of life of the patient.

A 20-year retrospective study in France (Gaillardin et al., 2012) demonstrated that of 109 patients who underwent CWU, 25% had evidence of residual disease after a mean follow-up of 48 months and required a second operation. The need for continuous long-term follow-up, either clinically or radiologically, was highlighted and it was concluded that CWU carries higher rates of recidivism compared to CWD.

Similarly, a retrospective study in India (Maiti et al., 2016) examined the outpatient follow-up of 81 patients after CWD. Over the seven-year period, patients had 968 visits to outpatient services with the average frequency being 11.95 visits per patient and the average interval being 6.52 months. At the time of publishing, 63% of these patients continued to require regular follow-up. This study demonstrates that CWD carries a higher morbidity resulting in a need for long-term attendance at the OPD for maintenance of the mastoid cavity. However, it results in lower rates of recidivism and better surveillance and some patients will develop a self-cleaning cavity, which requires less rigorous follow-up.

Likewise, a Canadian retrospective study (Thiel et al., 2014) documented the follow-up requirements of 71 patients after CWD over five years. In total, 632 visits were made of which the mean was eight. Debridement or wax removal by MAT was required on 347 occasions. By the end of the study period, 23% of patients continued to require follow-up in the form of MAT but a dry cavity was eventually achieved by 53 of the 71 patients. The study concludes that there is a need for long-term follow-up for these patients but that there is no clear predictor for the quality and quantity of care needed following CWD.
Another retrospective study, conducted in the UK (Khalil & Wendle-Taylor, 2003), reviewed the post-operative follow-up of 101 patients after CWD over a thirteen-year period. In total, 1341 visits were made with an average of 13.3 visits per patient. Two thirds of the group continued to require follow-up. Reason for this included removal of clinical features of chronic inflammation by MAT but not high incidences of recurrence. Although this study dates back fifteen years, it demonstrates that the surgical approach and subsequent follow-up remain the same today.

A Taiwanese commentary (Kuo et al., 2016) demonstrated the need for long-term surveillance of patients following CWD to assess the mastoid cavity structurally and for complications. According to the authors, nearly 90% of recurrent disease can be detected within five years but it can take more than 24 years for a late complication or recurrence of cholesteatoma to be discovered. It is therefore recommended that patients undergo follow-up for as long as possible. The article also highlights the fact that cholesteatoma may be diagnosed at any age, which has a significant impact on the length of follow-up a patient may require.

Finally, an audit by the Royal College of Surgeons in England (1995) of 611 mastoidectomies carried out by 55 consultants showed that CWD technique resulted in a significantly higher number of ‘wet’ ears than CWU but lower rates of recurrence due to better access to the lesion. This seminal work concludes that frequent follow-up is needed for mastoid cavity maintenance.

Irrespective of the long-term commitment, many surgeons still prefer a CWD approach due to its advantage of exceptional disease removal by resection of the posterior canal wall, which may lead to lower rates of recidivism (Wilson et al., 2013). All patients attending OPD following mastoidectomy surgery, regardless of the
surgical approach, require a thorough otoscopic examination and many will need intervention in the form of MAT to remove debris from a mastoid cavity (Kuo et al., 2016).

2.3.3 Non-Physician-Led Outpatient Clinics

According to Sláintecare, there is a need for careful workforce planning to meet current and future staffing needs (Houses of the Oireachtas, 2017). The report suggests that measures are needed to ensure that public hospitals become an attractive place to work for experienced, high quality staff. There is a need for sufficient numbers of consultants and other health professionals to meet population needs (Houses of the Oireachtas, 2017) and according to the report, choosing a better model of healthcare should be more efficient and cost-effective, although the need for an investment is anticipated in order to instigate change. Many countries outside of Ireland have embraced the help of non-physician roles to lead outpatient clinics for specific patient populations across numerous specialities for decades.

A randomised controlled trial carried out in Sweden (Larsson et al., 2015) examined the cost-effectiveness of a nurse-led rheumatology clinic for the management of patients with chronic inflammatory arthritis undergoing biological therapy. The study included 97 patients who, during one year, replaced one of their two regular follow-up rheumatologist visits with one led by a nurse. The result was a decrease in cost by 13% for the department and a decrease in the use of resources. A secondary outcome was an increase in appointments available for the consultant physician to see new patients or those with early or highly active disease.
A UK study (Uppal et al., 2004) examined the cost-effectiveness of a nurse-led otology clinic compared to a traditional doctor-led clinic. Over a year, 626 patients with ear complaints were seen by a nurse resulting in a cost reduction of over £75 per patient. This translated into an annual saving of £47,000 for the hospital. The nurse-led clinic was therefore considerably more cost-effective and presented an opportunity by freeing up otolaryngologists’ time to see more complex patients, as well as having the potential to reduce access time and increased continuity of care in the OPD. Although this study was conducted almost fifteen years ago, it demonstrates how non-physician healthcare providers have been employed to ease pressures on a health service, not dissimilar to that in Ireland, for over a decade.

Cho et al. (2014) specifically examined the utility of a nurse-led mastoid clinic. This retrospective study reviewed 100 patients who saw the nurse a total of 4,346 times in the clinic. The mean number of annual visits per patient was 5.3 and the average follow-up duration was 8.2 years. Unfortunately, the full paper was not available and attempts to contact the authors were unsuccessful. According to the abstract, a nurse or other healthcare professional can be sufficiently skilled in managing patients from this particular cohort. Of those who required intervention, 73% required cerumen removal while 20.3% required the application of topical ointment. Only 5.2% required a topical antibiotic prescription and 2% led to a referral to a doctor. The abstract seems to suggest that nurse-led clinics help provide rapid access to care for patients post-mastoidectomy whilst freeing up consultants to see more complex cases.

The Royal Victoria Eye and Ear Hospital (2016) in Dublin recently published a guideline for General Practitioners recommending that direct referrals for patients with cerumen impaction or other ear complaints can be made directly to a nurse-led
microsuction clinic. This service is usually offered only as a result of direct referral to audiology or ENT outpatient services. Similarly, a UK Study examining referrals to an ENT emergency clinic (Mahalingham et al., 2014) describes PAs working in an ENT emergency department, specialising in microsuction as a response to large volumes of ear wax referrals.

In the USA, PAs have long been employed in the outpatient setting. Reed & Hooker (2017) examined the effectiveness of five PAs working as part of a hospital group of the Veterans Health Administration. Over a two-year period, 13,885 orthopaedic encounters took place between a major veteran hospital and its community-based outpatient counterparts. The presence of PAs in outpatient clinics saw first time appointment wait times decrease from 30 days to ten days. Overall encounter volume went up by 31%, showing that the addition of PAs improves access for orthopaedic services. Other outcomes included less congestion in clinics and shorter wait times for new consults and return patients. The study also highlights several benefits of PAs over other healthcare professions: an ability to change roles, acquire new skill sets, be mobile, be adaptable and be flexible.

2.4 Implications for the Project

From the literature it appears that, compared to international and national standards, Ireland continues to experience unacceptable waiting list times. As a result, this may lead to poorer patient outcomes including increased morbidity and mortality rates. Irish and international government guidelines and strategies suggest that understaffing and a lack of funding are recurring factors contributing to the Irish waiting list crisis. Evidence also suggests that focussed care is needed for return
patients, in particular those who have undergone CWD mastoidectomy. Although the literature implies that CWU is a superior approach to mastoidectomy in terms of reducing the need for follow-up, CWD remains the preferred approach due to its excellent rate of disease clearance and lower rates of recidivism. Various Irish initiatives encourage thorough workforce planning including the expansion of staff bodies, both medical and non-medical. From international literature, there is evidence to suggest that non-physician-led clinics are of benefit in improving care for new and returning patients. The literature indicates that non-physician-led clinics result in reduced costs, increased appointment availability, better continuity of care, decreased access time and increased consultant availability.

For the purposes of this QIP, staffing levels and funding are not modifiable factors within the QI team’s scope. Similarly, the surgical approach used by many ENT surgeons in this hospital is not an amendable factor. From the literature reviewed, a potential solution to the waiting list problem may be to streamline certain patient populations. Separating patients who require regular outpatient care and redirecting them to a dedicated clinic may increase access to specialist care for new patients. Simultaneously, returning patients may benefit from better continuity of care.

2.5 Summary

This chapter has reviewed literature in relation to the QIP topic. It has provided an overview of a problem faced by the Irish health system and factors contributing to it. Waiting list targets were discussed on a national and international level and the need for better quality of care for patients following mastoidectomy surgery was demonstrated. The rationale for this was discussed in light of two different operative
approaches. The application of non-physician-led outpatient clinics was discussed and finally the implications of this review for the project were outlined. The following chapter will present the methodology applied to this QIP.
3.0 Methodology
3.1 Introduction
There are many approaches and models to consider when planning a QIP in healthcare but the focus should always be the same: the patient. Quality improvement in health demands an understanding of the patient's rights, needs and expectations (HSE, 2016b). Once these have been recognised, deficits in and barriers to their delivery can be identified and overcome. Kotter (1995) emphasises that only 30% of QI efforts involving change succeed, leading to the conclusion that although all improvement involves change, not every change is an improvement. It is therefore even more important to choose a model that is strong and appropriate for the QI vision. More than just a business strategy, QI is imperative to the delivery of high quality care. In order to practice medicine in today's world, a core understanding of QI is as imperative as an understanding of anatomy, physiology and biochemistry (AOMRC, 2016). This chapter will outline a selection of QI models used in healthcare. Next, the rationale for the model selected to guide this QIP will be explained after a brief overview of its structure. The model's components and their application to this QIP will be discussed in detail and the chapter will conclude with a summary.

3.2 Approaches to Quality Improvement
Quality improvement involves identifying a problem, investigating its cause, making an improvement using a systematic approach and measuring the outcome. Although the concept is often applied to business, QI has become an integral part of healthcare provision, including in Ireland. The goal of QI in healthcare should always focus on the patient and usually aims to improve the standard of care for patients
It is useful to employ a structured guide when planning a QIP. Of the many approaches available, three were considered for this project: The Institute for Healthcare Improvement (IHI) PDSA Cycle, the HSE Framework for Improving Quality and the Lean Six Sigma Model.

The PDSA Cycle was first developed by Associates in Process Improvement and introduced by the IHI with the goal of outlining a simple, effective tool to accelerate improvement. It serves to complement existing QI tools and provides a structure for making improvement and testing changes on a small scale (IHI, 2018). The model (Figure 1) consists of two parts: three questions that may be asked in any order and the PDSA cycle, which consists of four phases, namely Plan, Do, Study and Act (IHI, 2018).

![Figure 1: IHI PDSA Cycle (IHI, 2018)](image)

The first question encourages the establishment of an aim that is specific, measurable and that can be achieved in a realistic time frame. Question two prompts
the selection of a measurement that is usually quantitative. Finally, question three is used to select a change that will result in a measurable improvement. The fourth component, the PDSA cycle, serves as a process to test the selected improvement. The cycle can be used to test a pilot project and further cycles should be completed in order to make further improvements. With each cycle, the size of the project may be increased, for example from a single unit to the entire directorate and across the organisation.

The HSE Framework for Improving Quality was developed with the intent to influence and guide the reader's thinking, planning and delivery of care. It provides a strategic approach to QI and is influenced by international evidence and existing QI models. It is based on the vision of creating a healthier Ireland with a high quality health service (HSE, 2015). It focuses on improving particular aspects of patient care that are affected by understaffing and underfunding and emphasises that the health service is under considerable strain (HSE, 2015). Quality in the Irish health system is defined as care that is person-centred, safe, effective and leads to better health and wellbeing (Figure 2). It focuses on the combined effort of patients, healthcare workers, families, researchers, educators and providers to enable change which results in better patient outcomes and experiences of care as well as the continued support and development of staff in the delivery of high quality care (HSE, 2015).

Figure 2: Pillars of Quality of Care in Irish Healthcare (HSE, 2016b)
The framework consists of six drivers (Figure 3), designed to be used in combination. Funding for leadership positions and support structures are essential for the success of the model. It encourages a large-scale approach and encourages several simultaneous changes within an organisation by considering multiple factors within the delivery of health services. It encompasses various aspects of care and focuses heavily on the provision of leadership and change management as well as governance and measurement. A second part to this strategy is under development and the goal of the first document is to encourage awareness and understanding of the plan and to help institutions in realigning their focus and ethos, thus preparing them for its sequel.

![Figure 3: Drivers and Framework for Improving Quality (HSE, 2016b)](image)

The Lean-Six Sigma model for QI is a combination of two separate models: Lean and Six Sigma. The model can be accredited to Fujio Cho of the global car manufacturer Toyota. Mr. Cho first described the essence of Lean by emphasising that waste entails any activity that does not add to the business process (McIntyre,
He defines waste as anything other than the least amount of equipment, materials, parts, space, and time, which are indispensable to adding value to the product (McIntyre, 2016). Lean aims to provide high quality care and customer satisfaction and is based around five principles (Figure 4) which serve to eliminate process waste. The mnemonic ‘DOWNTIME’ describes these as follows: defects, over-production, waiting, non-utilised talent, transportation, inventory, motion and extra-processing (Rastogi, 2018). Although not designed for use in healthcare, the model can be applied effectively to the environment.

![Figure 4: The Lean Principles (Rastogi, 2018)](image)

Six Sigma, the second component of ‘Lean-Six Sigma’, is a methodology of problem solving, which is data based. It concentrates on process variation, customer satisfaction and continuous process improvement with minimal defects (Rastogi, 2018). It is based around the DMAIC framework, which stands for: define, measure, analyse, improve and control. Lean-Six Sigma is a philosophy of quality improvement that is based on facts and data and which values defect prevention. It
focuses on reducing variation and waste whilst promoting the use of work standardisation and flow (ASQ, 2009). Lean and Six Sigma are useful in combination and more effective when applied hand-in-hand. This integrated approach aids in improving process efficiency, optimising resources and improving customer satisfaction, while increasing profits and diminishing costs (Rastogi, 2018).

3.3 Rationale for Model Selected

The model selected to guide this QIP is Six Sigma encompassing the DMAIC framework. This model was chosen due to its clarity, specificity and user-friendliness. It provided a clear guideline for the planning of the QIP and allowed for efficient time management in the process. It serves to improve predictability of a project and to reduce variation in the process. The Lean model was considered during the define phase of the planning process and was used as a secondary tool due to its focus on the improvement of flow and the reduction of wait times as a form of waste. Although the IHI PDSA cycle is a useful tool, it does not emphasise data-collection and the use of QI tools. The model is useful in testing small changes for improvement and is therefore used during the control phase of this QIP. The core questions that the model promotes were a useful indicator of success during the course of this QIP and served as a worthwhile reminder of the overall goals of the plan.
3.4 Model Overview

The DMAIC framework as part of the Six Sigma model comprises five phases. Four of these will be outlined below, under separate headings, as they were applied. The fifth phase, control, will be discussed as part of the evaluation chapter.

3.4.1 Define Phase

At the outset of the define phase, a project charter (Appendix 1) was established. This included a problem statement, aim and objectives for the project, estimated benefits and barriers, an outline of the project’s scope, available resources and a timeline in which it should be completed. This was presented by the student as team leader, to the consultant ENT surgeon, as the project’s sponsor. The QI project team was established with the help of a stakeholder analysis (Figure 5). A stakeholder is any person, internal or external to the organisation, who has interest in and influence on the success or failure of a project. It involves consideration of persons’ motivations that might act as catalysts or inhibitors to the QIP (Van der Duin, 2016). Drivers may include improved patient care, financial gain, efficiency and staff satisfaction (Silver et al., 2016). After relevant parties were identified, they are categorised by level of power and interest. This process ensured that all relevant parties were informed and involved and aided in building a rapport with the resulting team and other stakeholders affected by the QIP.
Next, a Process Flow Map (Figure 6) was created. This planning and management tool provides an overview of a process within an organisation by means of a visual representation (Damelio, 2011). The map was created in order to examine the patient's journey within the ENT OPD. A total of eight patients, five new and three returning, were shadowed and times shown below represent an average of one patient's time spent in the department from start to finish. The map highlights the difference in consultant versus NCHD consultation time. It is worth noting that this map was created shortly after the NCHD changeover at the beginning of this year and times may be increased due to this. In addition, the difference in consultation time between new and returning patients was not accounted for. Nonetheless, the illustration demonstrates the increase in efficiency when an experienced healthcare professional consults with a patient as opposed to one who is inexperienced and/or
requires supervision. It also demonstrates that a good patient-doctor relationship affects consultation time since a more focused history, for example, can be recorded due to prior familiarity with the patient’s background.

![Process Flow Map of New and Returning Patients Attending ENT OPD](image)

*Figure 6: Process Flow Map of New and Returning Patients Attending ENT OPD*

Finally, a driver diagram was used. This tool aims to demonstrate a logical link between the final goal of a project or its problem, and relevant drivers and contributing factors (IHI, 2018). For this QIP, the tool helped establish a theoretical set of areas for improvement and allowed the QI team to discuss these and choose a point of focus for the project. Figure 7 demonstrates the various factors affecting waiting times for new referrals to the ENT service. Tertiary and secondary drivers
ultimately lead to two main issues affecting the problem: the insufficient number of new patients who are seen in the OPD and the volume of referrals being forwarded from general practitioners. The focus was placed on the inadequate volume of first-time referrals that attend the ENT OPD and the number of follow-up patients that are seen.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Primary Drivers</th>
<th>Secondary Drivers</th>
<th>Tertiary Drivers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Long ENT waiting list for new referrals</td>
<td>Large volume of return patients being seen in clinic</td>
<td>No Funding</td>
<td>Mesoedectomy patients must attend clinic at least yearly</td>
</tr>
<tr>
<td>Not enough new patients being seen in clinic</td>
<td>There are not enough doctors</td>
<td>Multiple consultants sharing clinic space</td>
<td></td>
</tr>
<tr>
<td>Large volume of new patients being referred</td>
<td>Not enough weekly clinic slots</td>
<td>No guidelines</td>
<td></td>
</tr>
<tr>
<td>Incorrect referrals by GPs</td>
<td>GPs unable to manage patients</td>
<td>Multiple GP visits</td>
<td></td>
</tr>
</tbody>
</table>

Figure 7: Driver Diagram

After establishing a QI team and choosing an area for improvement, the QIP plan was presented at the hospital’s weekly QI session, Lunch and Learn (McNamara et al., 2016). This provided the student with an opportunity to gain advice, insight and ideas from colleagues and other hospital staff members who attended the event by means of a brainstorming session after the presentation. A Gantt Chart (Appendix 2) was created in order to track the project’s schedule for the completion of the QIP and its write up. Subsequently, the need for data to support the problem arose and this process is discussed in the next section.
3.4.2 Measure Phase

According to Drucker (2012), if something cannot be measured, then it cannot be improved. Therefore the aim of this phase in the DMAIC process was to quantify the QI problem by means of various measurement approaches. These are outlined below and the measurement goals and processes are presented. For the purpose of this QIP, multiple approaches were used in order to obtain the most accurate representation of the problem.

Data was collected by liaising with staff from the HIPE department. Collaboration between the project lead and the department took place on a continuous basis from February to April. Data sought included:

- The total number of new patients awaiting appointments in 2017
- The total number of patients waiting to see the consultant in 2017
- The total number of patients who were waiting more than 52 weeks in 2017
- The number of Interventions carried out in the ENT OPD in 2017

Next, data was collected by liaising with the consultant’s secretary throughout the duration of the measure phase. The need for data, as outlined below, was expressed and through access to the hospitals online OPD database, the following information was obtained:

- The total number of patients seen by the consultant in 2017
- The total number of new patients seen by the consultant in 2017
- The total number of return patients seen by the consultant in 2017
In order to determine the number of patients who have undergone mastoidectomy surgery and the frequency of their attendance in the OPD, an extensive retrospective chart review would have been required. Unfortunately, due to time constraints and limited and difficult access to the hospital's medical records department, this approach was not possible. An alternative method was developed with help from the project's sponsor and the QI team. With permission from the hospital's clinical governance and audit managers, a questionnaire was designed (Appendix 3). The consultant completed this following clinic every Thursday. Data collection was completed over the course of thirteen-weeks. Information sought by means of this method included:

- Patient demographics such as age and gender
- The date on which the questionnaire was completed
- The grade of the doctor who saw the patient
- The nature and frequency of the patient's OPD attendance(s)
- The patient's diagnosis at the time of the consultation
- If any intervention was carried out during the appointment and what kind

After completion of the measure phase, data was analysed by the project lead. Information was arranged and categorised using Microsoft Excel and depicted visually using charts and tables.
3.4.3 Analyse Phase

The aim of the analyse phase of the DMAIC framework is to identify the cause of the problem. It is important to create a strong catalogue of data before examining its potential root causes. In this section, data collected during the measure phase will be presented and relevant analysis tools will be outlined as they were applied to this QIP. After liaising with the hospital’s HIPE and coding departments, data relating to the overall waiting list for patients, as well as the volume of procedures carried out in the OPD was collected and analysed. As of 23rd February 2018, 2,339 patients were waiting for a first-time appointment between four ENT consultants with the average being 585. A total of 766 patients were waiting to be seen by the consultant; 181 (31%) more than average. Of these, 399 (52%) were waiting for more than twelve months. The waiting list dated back significantly for all consultants ranging from August 2016 to October 2014 for the longest waiter. Figure 8 demonstrates the number of patients waiting to be seen by the consultant as well as the proportion waiting for more than twelve months.

![Figure 8: ENT OPD Waiting List Data 2017](image)

Collaboration with the consultant’s secretary revealed that the consultant and the team saw 882 patients during their 37 adult clinics between January and December
2017. Of these, 630 patients were returning for a subsequent appointment and 252 were patients who had been newly referred (Figure 9). On average, the team saw seven new patients and seventeen returning patients per clinic. Four clinics had been cancelled throughout the year.

![Pie chart showing 29% return and 71% new patients](image)

**Figure 9:** ENT OPD New and Return Patients 2017

The most significant component of the project’s measurement process was the ENT OPD questionnaire, which was completed every Thursday after the consultant’s 9.30am clinic. The consultant liaised with fellow team members and completed each questionnaire accordingly. Initially, questionnaires for both adult and paediatric clinics were completed but it was agreed that the focus would be placed on adult clinic only, as paediatric waiting lists are generally short or non-existent. Of the twelve clinics for which data was collected, eight were dedicated to adults, two were paediatric clinics, one was cancelled due to adverse weather conditions and questionnaires for the remaining clinic were not completed. Questionnaires were kept in a dedicated space in the reception office and collected regularly by the project lead. Data was collected from the 1st February 2018 to the 19th April 2018. An extensive amount of data was gathered and can be found in Appendix 4.
During eight adult clinics, a total of 170 patients were seen. Of these, 64 were new patients and 106 were returning patients. Of the returning patients, 24 had undergone mastoidectomy surgery and thirteen suffered with CSOM (Figure 10). Of the mastoidectomy patients, seventeen were seen by an NCHD. Fifteen mastoidectomy patients required annual follow-up and nine required biannual follow-up. In total, 35 patients required MAT. Of the new patients, five had a new diagnosis of CSOM and required MAT and future follow-up. A further thirteen patients also required MAT for other ear complaints.

![Figure 10: Adult Patients Attending ENT OPD 01/02/18 – 19/04/18](image)

Collaboration with the hospital’s coding department revealed that 4,476 procedures were carried out in the ENT OPD in 2017 and 1,614 were MAT. With 2,021 fiberoptic examinations of the pharynx (FEP), this procedure was the most common but is mostly carried out by consultants with a special interest in head and neck oncology or as part of pre-operative vocal cord assessment. Because this project focuses on general ENT services only, this number was disregarded. The third most common procedure carried out was sinoscopy (219). It is clear to see that MAT is by far the
most common procedure carried out by doctors focusing on general ENT as a surgical specialty (Table 1).

<table>
<thead>
<tr>
<th>Month</th>
<th>Total</th>
<th>MAT</th>
<th>FEP</th>
<th>Laryngoscopy</th>
<th>Sinoscopy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>347</td>
<td>146</td>
<td>116</td>
<td>24</td>
<td>13</td>
</tr>
<tr>
<td>Feb</td>
<td>355</td>
<td>113</td>
<td>175</td>
<td>7</td>
<td>19</td>
</tr>
<tr>
<td>Mar</td>
<td>433</td>
<td>166</td>
<td>164</td>
<td>11</td>
<td>18</td>
</tr>
<tr>
<td>Apr</td>
<td>323</td>
<td>123</td>
<td>139</td>
<td>14</td>
<td>5</td>
</tr>
<tr>
<td>May</td>
<td>397</td>
<td>146</td>
<td>175</td>
<td>22</td>
<td>23</td>
</tr>
<tr>
<td>Jun</td>
<td>374</td>
<td>109</td>
<td>193</td>
<td>13</td>
<td>11</td>
</tr>
<tr>
<td>Jul</td>
<td>351</td>
<td>126</td>
<td>161</td>
<td>8</td>
<td>22</td>
</tr>
<tr>
<td>Aug</td>
<td>369</td>
<td>136</td>
<td>155</td>
<td>8</td>
<td>21</td>
</tr>
<tr>
<td>Sep</td>
<td>397</td>
<td>124</td>
<td>210</td>
<td>2</td>
<td>24</td>
</tr>
<tr>
<td>Oct</td>
<td>404</td>
<td>141</td>
<td>179</td>
<td>6</td>
<td>19</td>
</tr>
<tr>
<td>Nov</td>
<td>363</td>
<td>145</td>
<td>153</td>
<td>5</td>
<td>25</td>
</tr>
<tr>
<td>Dec</td>
<td>363</td>
<td>118</td>
<td>171</td>
<td>4</td>
<td>19</td>
</tr>
<tr>
<td>TOTAL</td>
<td>4476</td>
<td>1614</td>
<td>2021</td>
<td>124</td>
<td>219</td>
</tr>
</tbody>
</table>

Table 1: Breakdown of Procedures Carried out in ENT OPD in 2017

A Fishbone Diagram, also known as an ‘Ishikawa Diagram’ (Tague, 2005) was created as a means to analyse the cause and effect of a problem (Figure 11). Causes were divided into the following categories: people, environment, method or process and equipment. Of the factors contributing to these four categories, some were modifiable and some were not modifiable. The lack of OPD consultation rooms was not a modifiable problem, nor was the limited amount of clinic time in this instance. Measures to reduce the number of patients who do not attend scheduled clinic appointments were already in place in the form of text reminders and validation letters. With regard to equipment, there are three microscopes available within the department but only two are functional. This was discussed with the QI team and the potential for repair of this equipment was acknowledged but not chosen as an area of improvement for this QIP. The Number of staff however, particularly of those who
are experienced, was a modifiable factor in the context of this QIP. Similarly, the large volume of returning patients attending the OPD was an amendable factor. These findings assisted the QI team in the development of a list of the ‘5 Whys’ (Figure 12) in order to support or challenge the aforementioned findings.

### Figure 11: Fishbone Diagram

The ‘5 Whys’ is a QI tool that aids in the identification of the root cause of a problem and is a simple, effective tool when applied to problems that involve human factors or interaction (Card, 2017). From the illustration below, it is apparent that the ultimate contributing factor to the problem identified during the define phase is the large volume of returning patients who have undergone mastoidectomy surgery or who suffer with other conditions, such as CSOM and also require intervention in the form of MAT. Following analysis of the aforementioned data and the application of the QI tools, a brainstorming session helped the team develop an aim, which could be piloted as a solution, as outlined in the next section.
3.4.4 Improve Phase

The improve phase of the DMAIC framework serves to pilot a solution to the problem. After brainstorming various ideas, the decision to create a dedicated mastoidectomy clinic was made. After discussion with the QI team, a PDSA Cycle was created in order to test the proposed improvement (Appendix 5).

Available resources were assessed in order to plan the pilot. The OPD schedule for the consultant encompasses just one timeslot from 9.30am to 12.30pm every
Thursday. The consultant runs three adult clinics per month and one paediatric clinic. The remainder of the ENT clinic schedule can be seen below (Table 2).

<table>
<thead>
<tr>
<th>ENT CLINIC SCHEDULE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Clinic Day</strong></td>
</tr>
<tr>
<td>Monday</td>
</tr>
<tr>
<td>Tuesday</td>
</tr>
<tr>
<td>Wednesday</td>
</tr>
<tr>
<td>Thursday</td>
</tr>
<tr>
<td>Friday</td>
</tr>
</tbody>
</table>

Table 2: Regular ENT Clinic Schedule 2017-2018

Availability for the dedicated mastoidectomy clinic is marked with stars above. The Nasal Bone Fracture Clinic at 1.30pm on Fridays is also marked because the clinic is run by NCHDs and does not demand full capacity of the OPD. After discussion with the project sponsor, it was decided that the pilot clinic would take place on the 26th April 2018 during regular clinic hours. In order to allow for cancellations and non-attendance, twelve patients were contacted by the consultant’s secretary via telephone and informed of the pilot project. The patients were known to the service and expected to attend for a routine appointment in the coming weeks and were asked if they would be willing to attend at an earlier opportunity. Nine patients agreed to attend. In total, there were 21 patients scheduled for this clinic: nine mastoidectomy patients, three new and nine other returns. A mastoidectomy patient cancelled their appointment ahead of time and two patients, one new and one
mastoidectomy patient, did not attend their appointment on the day. All patients, new and return, were divided amongst four NCHDs but the seven mastoidectomy patients were seen by the same, experienced, senior NCHD who had been working in the department for more than twelve months.

On the 26th April, the project lead arrived to the ENT department at 8.30am in order to greet patients partaking in the pilot. Each patient received a short, anonymous questionnaire (Appendix 6), which they were asked to complete at the end of their appointment. Two of these patients were unable to read and write; therefore assistance was provided with both the information leaflet and the questionnaire. Each patient was shadowed, in order to measure times, from arrival time to the end of the appointment. Questionnaire and timing data are shown in Table 3.

| App't Time | Arrival Time | IN | OUT | Wait Time | Consult Time | MAT | Q2 | Q3 | Q4 | Q5 | Q6 | Q7 | Q8 | Q9 | Q10 |
|------------|--------------|----|-----|-----------|--------------|-----|----|----|----|----|----|----|----|-----|
| 8 10.00am  | CANCELLED    |    |     |           |              |     |    |    |    |    |    |    |    |     |
| 9 11.00am  | DNA          |    |     |           |              |     |    |    |    |    |    |    |    |     |

Table 3: Data Collected During Pilot Mastoidectomy Clinic

Mastoidectomy patients were scheduled at approximately 30-minute intervals. The average wait time was 24 minutes. The average appointment time was ten minutes and the overall average time spent in the department was 33 minutes. MAT was required by over half of the patients while a consultation and examination were sufficient for the remainder. The average patient age was 53 years (range 31-67). The average age at which patients underwent their first mastoidectomy surgery was
38 years of age (range 12-53). The majority of patients (57%) stated that they attend the clinic 6-monthly. The remaining 43% stated that they attend annually. The earliest mastoidectomy was carried out in 1982, while the most recent was in 2011. Two patients had bilateral surgery, one patient had bilateral surgery with unilateral revision, two had unilateral surgery and a further two had unilateral surgery with revision of the same side. As a whole, these patients have attended the ENT OPD for review 260 times over a period of 36 years for care of their mastoid cavities. The average number of visits per patient was 37 (range 7-70) over an average of 23 years, since achieving a ‘stable cavity’ following initial post-operative follow-up.

In order to maximise the efficiency of the consultations, a pro forma (Appendix 7) was used as a method of documentation. This was designed in conjunction with the consultant on the basis of similar forms used in the cochlear implant clinic. The document required basic patient information, information specific to the patient’s past medical and surgical history and a checklist designed to accurately record findings of the otoscopic examination. It was designed to minimise the amount of note writing necessary during the consultation and to shorten the time spend completing paperwork during subsequent consultations. It provided a clear, written document for each patient and ensured that a thorough examination and consultation were carried out, thus encouraging safe, high-quality care.

No patient was dissatisfied with his or her wait time and no one was inconvenienced by the change in appointment time. Of the seven patients who attended, two reported that they would like to be seen by the same person during each visit, while five stated that they would not mind. Five stated that they are sometimes seen by the consultant and by an NCHD other times. The other two patients said that they are
normally seen by an NCHD. One person commented that the ‘Staff in ENT are great’. Overall, the results of the pilot were encouraging and positive.

3.5 Summary
This chapter provided an overview of a selection of QI models available for use in healthcare. The rationale for the model selected was outlined and the DMAIC framework was discussed in detail. Next, the define phase of the project was discussed. The QI tools used to form the QI team and to explore the problem of large volumes of patients attending the ENT OPD were shown. The measure phase was discussed and demonstrated the kind of data that would help support the problem, and how it was obtained. The outcomes of the data analysis process were presented. Results demonstrate the extent of ENT waiting times for 2017 and that over half of patients on the list were waiting for more than 52 weeks. It was discovered that a large percentage of patients who attended were returning (71%) and that MAT was one of the most commonly performed OPD interventions. Lastly, the improve phase outlined the test of a dedicated mastoidectomy clinic in which seven patients were seen alongside the regular ENT OPD. Findings from the patient questionnaire highlighted the high frequency and long duration of the average patient’s follow-up after surgery. The next chapter will include a detailed plan for the final phase of the framework, the control phase, and demonstrates how a dedicated mastoidectomy clinic might be implemented in the future in order to reduce the waiting list for new referrals to the ENT OPD.
4.0 Evaluation
4.1 Introduction

This chapter summarises the proposed QIP and its outcomes following a trial of the improvement. The aim of the control phase of the DMAIC framework is described. A strategy to monitor and review the success of the planned improvement is presented and its expected results outlined. Finally, a dissemination plan for the QIP is provided before the chapter concludes with a summary.

4.2 Overview of QIP and Outcomes

After identifying outpatient waiting list times as a major problem affecting the ENT department, a plan for a QIP was developed using the DMAIC framework. Various QI tools were applied during the process of identifying major contributing factors. Data collection related to the consultant’s waiting list in 2017 was carried out and revealed that 766 patients were waiting to attend his clinic. This equated to almost 50% of the overall waiting list for all four general ENT consultants. Of the 766 patients, 52% had been waiting for more than twelve months, which exceeds the HSE national target of 15% (HSE, 2016a) by more than threefold. After a thirteen-week data collection period, it was found that of the 170 patients who were seen over eight clinics, only 38% were newly referred. Of the 106 returning patients, 24 were attending for routine long-term follow-up after mastoidectomy surgery and thirteen regularly attended due to a diagnosis of CSOM (Figure 13). This data supported the need to redirect a portion of return patients from the consultant’s regular clinic to another dedicated clinic in order to create more appointments for the backlog of newly referred patients awaiting a first time appointment.
Next, a plan for a pilot of a dedicated mastoidectomy clinic was designed. During the regular Thursday clinic, seven mastoidectomy patients attended for a routine follow-up appointment that had been rescheduled and brought forward by the secretary. All patients, new and return, were seen by NCHDs on the day. The mastoidectomy patients were all seen by the same doctor. A pro forma was used to simplify the documentation process during the pilot. The project lead shadowed mastoidectomy patients’ OPD journeys and recorded times at various points throughout their visit. In addition, the seven pilot patients completed an anonymous patient questionnaire. Data analysis revealed that the average time spent in the department was only 33 minutes and the average appointment time was 10 minutes. On average, patients had 37 visits to the department over 23 years. Over half required biannual follow-up
and the majority required MAT on this occasion. Finally, all patients who attended the pilot clinic were satisfied with the care they received on the day.

Overall, the improvement tested via a pilot resulted in positive outcomes. Patients’ waiting times within the department were reduced and patients were satisfied with their consultation with an experienced NCHD. Although five of the seven patients are normally seen by an NCHD and the consultant, they did not mind that they were not seen by the consultant on this occasion. The seven mastoidectomy patients were seen in one dedicated OPD space with access to a microscope with suction and separate from the remainder of the clinic attendees on the day. This helped to improve appointment efficiency for these patients, and the doctor, as there was no waiting time to access equipment or space. This also decreased turnover time because returning mastoidectomy patients did not have to wait for new patients, who require a longer consultation, to be seen first. Lastly, seven additional appointment slots were created for new patients due to mastoidectomy patients bypassing the regular clinic.

4.3 Aim of Control Phase of DMAIC

The final step in the DMAIC process is the control phase. The aim of this phase is to maintain the solution to the problem and thus, sustain the improvement. After the pilot clinic was carried out during the improve phase, a debriefing was held with the QI team in order to evaluate its success. Minor areas for improvement were identified and subsequently, a new PDSA cycle was developed. The main problem to be addressed was that of the pro forma which was used during the pilot. Since there was no pre-existing pro forma being used in the hospital or other institutions, the
project lead and sponsor had no reference to model its design by. A similar form used by the cochlear implant team was used as a template instead. Although the NCHD was satisfied with the design, there was one intrinsic flaw. The document only provided the opportunity to record findings for one mastoid cavity. The possibility of bilateral intervention had not been accounted for and therefore, a continuation sheet was developed for future use (Appendix 8).

4.3.1 Monitoring & Review

In order to monitor the success of the improvement, the project lead recommends reviewing data collected by the access department on a quarterly basis. This would allow for the length of the consultant’s waiting list to be reassessed, specifically that of patients waiting for more than twelve months. This data could then be compared to previous figures in order to evaluate whether the QIP is achieving its intended aim. It would also be pertinent to collect data related to patient satisfaction. The student suggests doing this by means of a patient satisfaction survey following the first implemented mastoidectomy clinic and for a period of one year in order to ensure that a majority of regularly returning patients are given the opportunity to evaluate the QI. A staff satisfaction survey would also be helpful in assessing the success of the QI. This feedback could aid the identification of any issues with the project design as they arise over time and thus enable further PDSA cycles to be developed. Lastly, the student suggests maintaining contact with the QI team in order to continually ensure that the improvement remains in place and that any adjustments that are needed can be made.
4.3.2 Expected Results

By removing a number of review patients, either post mastoidectomy or with a diagnosis of CSOM, the equivalent amount of appointments could be made available for newly referred patients. Based on the thirteen weeks of data collected during the measure phase, removing five patients from the consultant’s weekly clinic could create approximately 185 new appointment slots per year. Based on figures from 2017, one year constitutes 37 clinics. Removing this number of patients should result in a 46% reduction of the list of patients waiting over 52 weeks for a first-time appointment within one year. This could result in the elimination of this waiting list in just over two years.

Secondary results expected include better continuity of care and safer care for patients who require long-term follow up. Assigning a permanent team member to treatment of this cohort of patients could improve the patient-healthcare provider relationship and improve the patient’s overall experience. According to the consultant, it is hoped that assigning a highly skilled professional to carry out otoscopic examinations and MAT could improve patient safety by decreasing the risk of complications or missed disease recurrence. It is hoped that the use of a pro forma, as shown in Appendices 8 and 9, would further promote safer patient care by providing clarity, guiding a thorough assessment and providing a clear record of care for future healthcare providers. Overall, the combination of a dedicated team member and a structured, standardised documentation process could improve efficiency within the clinic, decrease appointment times and improve the global process of the clinic. Crucially, the consultant could be free to attend to new patients and patients with complex needs.
4.4 Dissemination Plan

The outcomes of the planning process of this QIP were shared with the project sponsor. In order to introduce the QI initiative within the organisation, a plan should be formulated in conjunction with the sponsor and presented to the relevant stakeholders. Approval would be required from senior stakeholders such as the clinical directors of the otolaryngology department and the chief executive officer of the hospital. It is important that all stakeholders affected by the project are informed of the proposed improvement. This includes any staff member working within or in conjunction with the ENT department, such as nursing staff, doctors of all grades and administration staff including the HIPE department and secretaries involved in the scheduling of appointments. A proposal to assign a staff member to the new, dedicated clinic would be made. In addition, the need for servicing and repair of all available microsuction equipment within the ENT OPD, as identified during the analyse phase (Figure 11), would be outlined. The benefit would be rationalised in terms of its potential to increase resources and productivity. It is hoped that the project could be implemented by the beginning of 2019 and that the project’s aim could be achieved by the beginning of 2021.

4.5 Summary

This chapter provided an overview of the proposed QIP and demonstrated the extent of its potential for quality improvement. Its outcomes, following a trial of the improvement, were summarised before the aim of the control phase of the DMAIC framework was described and an approach to monitor and review the success of the planned improvement was discussed. Expected outcomes of the implemented
improvement were summarised and a dissemination plan for the introduction of the QIP was proposed. The following and final chapter will provide a discussion and conclusion of the QIP as outlined thus far.
5.0 Discussion & Conclusion
5.1 Introduction

This chapter will discuss the potential impact of the QIP on its stakeholders and the institution. The strengths of the project and its limitations will be addressed before a recommendation for the plan’s implementation will be outlined. The student’s experience throughout this QIP will be discussed and the dissertation will end with a summary and a conclusion.

5.2 Project Impact

The following three sections will detail the impact of the project on new and returning patients attending the ENT OPD and staff working within the department. The overall organisational impact will also be described, based on the successful implementation of this QIP.

5.2.1 Patients

As with most QI endeavours in healthcare, the patient should be the focus of the improvement (HSE, 2016b). The expected outcome of this project is that care for new and returning ENT patients could be improved. For new patients it is hoped that waiting list times could be reduced and that no patient would be waiting for more than 52 weeks after two years. Patients could benefit from faster access to specialist care and increased availability of the consultant. This could result in better quality of care and improved patient outcomes as outlined by the National Service Plan (HSE, 2017b).
Returning patients could experience improved quality of care with respect for all five core principles of the Framework for Improving Quality (HSE, 2016b). Patients could be offered care that is safer, more person-centred and more effective; thus resulting in better health and wellbeing for all. Regular follow-up with the same healthcare provider could promote comfort and familiarity with the patient and encourage a relationship built on trust. Return patients could benefit from safer care secondary to its provision by an experienced healthcare professional, with the advantage of a pro forma. Return patients could benefit from reduced wait times on appointment days and direct access to efficient care within a dedicated clinic.

5.2.2 Staff

There would be an expected period of adjustment as existing staff roles are redefined and the routine of the clinic is amended. The project would rely on the cooperation and enthusiasm of staff. There would initially be a need for the consultant and senior team members to train and integrate the lead of the mastoidectomy clinic. Once adequate training and supervised practice have been completed, the consultant could benefit from the help of a skilled colleague who could be trusted to care for certain patients. The consultant could benefit from increased time for new patients and patients who require more complex care. NCHDs may be able to consult with more new patients while mastoidectomy patients are cared for separately. The introduction of a dedicated staff member could also enable NCHDs to engage in learning opportunities away from the OPD. A dedicated team member could relieve pressure during busy OPD clinics and could facilitate an
often-stressful time of the year, NCHD changeover, by providing continuity of care to patients and experience, knowledge and familiarity with the service to new NCHDs.

5.2.3 The Organisation
The department could experience a more efficient service due to resources, such as equipment, time and space being utilised more effectively. There could be a decrease in the amount of wasted time and the department could enjoy an improved process flow as well as an increase in turnover. For the organisation, increased service efficiency and better use of resources could have a positive economic impact. The hospital could boast more satisfied staff and patients as well as positive reviews by achieving many standards set out by HIQA (2012). The organisation could become a pioneer and leader in the world of Irish health by assigning a dedicated healthcare professional, such as a PA, to the ENT specialty.

5.3 Strengths of the Project
From the outset and throughout the planning and trial of this QIP, the ENT department were proactive and interested. It was a relief to receive support from fellow QI team members and stakeholders involved in the project. The project sponsor was attentive to detail during the data collection period involving the clinic questionnaire, which made data analysis straightforward. During the improve phase, the secretary, medical and nursing staff present on the day worked hard and with enthusiasm to ensure that the clinic ran smoothly. Patients were supportive and optimistic throughout the pilot and their cooperation resulted in a successful test of the improvement. Apart from continued encouragement and assistance, strong
organisation prepared the foundation for an effortlessly constructed QIP. Potential strengths of the project include improved quality, safety and continuity of care for new and return patients; better use of resources and funding; improved efficiency and process and the project’s potential for translation within other directorates.

5.4 Limitations of the Project

During the pilot clinic, one particular limitation became apparent. The clinic was held on a day where many returning patients were scheduled to attend. The overall number of patients remained in keeping with the average of 21 but it was not possible to reschedule a larger volume of patients aside from the mastoidectomy patients. It would have been useful to increase the overall number of patients attending OPD that day, in particular the number of new referrals, in order to see an obvious improvement. Therefore a further trial of the improvement should be carried out.

This QIP encompasses a cost neutral approach, assuming that the hospital is adequately staffed. Since this is not the case, another weakness of the plan arises from the need for an additional member of staff. Although the project may require an initial investment, the cost of employing a PA, for example, could be of long-term benefit since PAs have the potential to actually reduce overall costs to the institution (Drennan et al., 2015).

Clinic time availability was identified as an issue since the ENT OPD schedule is completely occupied, Monday through Friday. This problem may be solved by redirecting patients to other hospitals affiliated with the organisation, or by availing of unoccupied theatres equipped with a microscope. Alternatively, the mastoidectomy
clinic may also be held on days where the consultant is away or on occasions where other consultants’ clinics are cancelled.

Finally, patient willingness to be seen by a non-physician healthcare professional may be a barrier to the success of the project, although data collected via the patient questionnaire during the pilot indicated that this is not be the case (see Table 3). A recent Irish study (Joyce et al., 2018) investigating patients’ willingness to be seen by a PA, showed that most patients were willing to do so, especially when time was variable.

5.5 Recommendations

Final collaboration with the hospital’s coding department revealed that the consultant performed 59 mastoidectomies over the last eight years (2010 – 2017). This results in an average number of seven mastoidectomies per year. Considering the need for initial post-operative follow up and two further visits to the ENT OPD within the first year, it can be concluded that approximately 21 appointments for these patients alone will be needed each year. Results from the pilot clinic patient survey highlighted that the earliest mastoidectomy was performed in 1982. Based on this information, and considering the average number of seven new procedures carried out per year, it can be estimated that roughly 260 mastoidectomies have been performed to date. This means that the same number of appointments, roughly, is needed each year to care for patients returning at least once per year for follow-up. Over a 37-clinic-year (based on 2017 statistics), seven mastoidectomy patients would need to be seen per weekly mastoidectomy clinic in order to redirect these 260 patients from the regular clinic. By doing so, the list of new patients waiting >52
weeks could be eliminated in under two years. In reality, a proportion of these patients have stopped requiring follow-up of their mastoid cavity; therefore the original recommendation of five patients per mastoidectomy clinic should be applied with the addition of patients with other conditions requiring MAT, such as CSOM.

A review of ENT UK guidelines (Jardine et al., 2017) recommends that for each ENT consultant, a maximum of twelve patients should be scheduled per four-hour clinic. For every senior specialist registrar, ten is an acceptable number (Jardine et al., 2017). The guidelines also advises that if junior doctors who require supervision are working in the clinic, the overall number of patients should be reduced by one per junior trainee. The recommended consultation time per patient is fifteen minutes for a return patient and 20 minutes for a new patient and the duration should be increased to 30 minutes where consent is to be obtained (Jardine et al., 2017). Lesser (2013) also highlights the importance of safe numbers in the ENT OPD and recommends no more than fourteen patients to be scheduled per doctor per four-hour clinic.

In light of the aforementioned guidelines, it seems reasonable that a PA, or another qualified healthcare professional, could see ten patients or less per mastoidectomy clinic with an appointment time of fifteen to 20 minutes per patient in a four-hour clinic. It is worth noting that in addition to the 24 mastoidectomy patients who attended clinic from February to April 2018, thirteen return patients had CSOM, requiring regular MAT. Of the 64 new patients that were seen, five were diagnosed with CSOM (Figure 14). In total, thirteen others required MAT (Appendix 4). This suggests that many patients with ear conditions require MAT and therefore the clinic could be renamed ‘Microsuction Clinic’ and expanded to include not only CSOM and mastoidectomy patients but also patients with cerumen impaction, otitis externa and other uncomplicated ear conditions. This could enable a larger volume of patients to
be streamlined allowing the consultant and the team to see more new or complex patients.

**Figure 14:** New Patient Diagnoses 01/02/18 – 19/04/18

### 5.6 Learning about Quality Improvement

As a PA student with no prior QI experience, I learned a wealth about the topic and its process. I learned the importance of teamwork. Without the help of others, this project would not have been possible. I learned that a common interest in and passion for a goal is what ultimately drives the success of an idea. I gained knowledge and skills through the study of QI models, such as the DMAIC framework. With the help of this guide, I understood that it does not suffice to simply identify a problem and create a solution; I learned that it is crucial to explore its complex web of contributing factors. Finally, I learned that with the right motivation, interest and support, even the most ambitious goal can be achieved. By approaching this project one step at a time and celebrating small milestones, I was motivated to continue and
pursue my goal and I will carry on doing so in the future. From the outset of this QIP, I found myself thinking of solutions to the problem before using structured QI tools to assess its various contributing factors. Therefore, if I were to carry out this QIP again, I would make an effort to avoid jumping to conclusions regarding a solution from the beginning of the plan.

5.7 Summary and Conclusion

Hospital waiting lists are a global epidemic affecting almost all medical and surgical specialities. With an ageing population and pressures on its healthcare system, Ireland is no exception. Although many specialities struggle with long wait times, ENT appears to be one that is particularly burdened. Due to high volumes of new referrals and vast numbers of return patients, it is hard to find a balance that provides adequate care for everyone. Many patients attending ENT services are enrolled in lifelong surveillance programmes after a cancer diagnosis or suffer with chronic conditions or post-operative complications. Patients, who have undergone mastoidectomy surgery for conditions such as cholesteatoma, often require long-term care as a trade-off for disease cure. Mastoidectomy more often than not results in a mastoid cavity, which requires regular maintenance.

Post-mastoidectomy patients are seen in the same OPD as new patients. This results in long waiting times requiring time off from work and an emotional burden as patients are regularly met by new faces and endure often unnecessarily lengthy consultations. Similarly, patients with chronic ear conditions such as CSOM are seen in the regular clinic and suffer delays and inconveniences for relatively straightforward consultations. This also has a knock-on effect for new patients who
are forced to spend months to years waiting for an appointment due to their involuntary competition with returning patients.

In an ever-changing health system, it makes sense to move forward and introduce change where an improvement is anticipated. PAs, and other non-physician healthcare professionals, have been shown to positively contribute to a team-based approach to care (Hylton & Scardino, 2016). The introduction of a dedicated ‘microsuction clinic’ could streamline a large proportion of return patients from the regular clinic into a dedicated clinic and therefore cause a considerable impact on the overall wait time for new patients. A routine consultation with an otoscopic examination and MAT by an experienced provider is often sufficient. This could optimise the clinic process and increase turnover, benefiting both new and returning patients. Finally, it could provide continuity of care and thus a person-centred approach as well as safety, according to the consultant, by creating more time for consultants to focus their expertise on new and complex referrals.

In chapter 1.0, the rationale for the project was described and its aim and objectives outlined. Literature in support of the QIP was discussed in chapter 2.0. The methodology chosen for the QIP was outlined in detail in chapter 3.0 and chapter 4.0 evaluated the project in its entirety. Chapter 5.0 included a discussion of the project in its entirety and recommendations for its implementation. Finally, this section outlined a summary and conclusion of the problem identified, the current process and the overall aim and impact of the QI strategy.
6.0 References


Health Information and Quality Authority (HIQA), 2011, Report and Recommendations on Patient Referrals from General Practice to Outpatient and Radiology Services, including the National Standard for Patient Referral Information, Available at: https://www.hiqa.ie/system/files/gp_referral_report.pdf [Accessed: 26th April 2018]
Health Service Executive (HSE), 2018, *National Service Plan 2018: Building a Better Health Service*, Available at:

Health Service Executive (HSE), 2017a, *Outpatient Services*, Available at:
https://www.hse.ie/eng/services/list/3/acutehospitals/patientcare/outpatientservices/
[Accessed: 20th December 2017]

Health Service Executive (HSE), 2017b, *National Service Plan 2017: Building a Better Health Service*, Available at:

Health Service Executive (HSE), 2017c, *The National Patient Experience Survey: Findings of the 2017 Inpatient Survey*, Available at:

Health Service Executive (HSE), 2016a, *Strategy for the Design of Integrated Outpatient Services 2016-2020*, Available at:

Health Service Executive (HSE), 2016b, *Framework for Improving Quality in our Health Service – Part 1: Introducing the Framework*, Available at:


Institute of Healthcare Improvements (IHI), 2018, *Science of Improvement: How to Improve*, Available at:
http://www.ihi.org/resources/Pages/HowtoImprove/ScienceofImprovementHowtoImprove.aspx [Accessed: 7th August 2018]


7.0 Appendices
## Appendix 1: Project Charter

| **Problem Statement** | There are too many patients waiting for a first-time appointment with the consultant.  
The consultant has a large volume of regular return/life-long follow-up patients. |
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<td><strong>Aim</strong></td>
<td>To reduce the amount of newly referred patients waiting to be seen by the consultant by eliminating a number of returning patients from the regular OPD schedule.</td>
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| **Objectives**        | • Collect data to support the problem and a possible solution  
                         • Analyse the problem using QI tools  
                         • Design a designated clinic for returning post-mastoidectomy patients where patients can be seen by a dedicated healthcare professional  
                         • Carry out a pilot of the proposed project  
                         • Evaluate project success |
| **Possible Benefits** | • Increased number of new patients seen in the ENT OPD  
                         • Reduced wait times for new referrals  
                         • Improved continuity of care for lifelong returning patients  
                         • Improved quality of care for lifelong returning patients  
                         • Improved access to specialist care for new patients  
                         • Better overall patient experience  
                         • Better use of staff and resources  
                         • Better turnover/ Increased efficiency  
                         • Positive feedback from staff and patients |
| **Possible Barriers** | • Funding/Cost  
                         • Resistance to change from staff  
                         • Clinic availability  
                         • Staffing  
                         • Patient willingness to be seen by somebody new |
| **Resources**         | 1. OPD every Thursday from 9.30am to approx. 1pm  
                         2. 3 consultation rooms and 3 procedure room cubicles  
                         3. 3-5 doctors, including the consultant  
                         4. 2 working microscopes with suction and 1 needing repair |
| **Scope**             | Assessing OPD process and design using QI tools and analysing the cause of the problem and implementing a trial of an improvement. |
| **Timeline**          | January 2018 to May 2018 |
Appendix 2: Gantt Chart

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Appendix 3: ENT OPD Questionnaire

[The Consultant] ENT OPD Clinic Questionnaire

Purpose: Dissertation, MSc Physician Associate Studies
Location: The Hospital, Dublin
Researcher: Project Lead
Sponsor: The Consultant
Duration: 1st February 2018 to 19th April 2018

Patient Age: Patient Gender:

Thank you for taking the time to complete this survey. Your feedback is greatly appreciated. Please ensure you answer all questions in full and for every patient seen in clinic between the above dates.

Date: __________________________

Doctor Grade:  □ Intern
               □ SHO
               □ Registrar
               □ SpR
               □ Consultant

1) Is this patient:  □ New
                   If so, when will they be returning to clinic?
                   __________________________
                   □ Return/Follow-up
                   □ Lifelong/Surveillance
                   If so, how frequently do they attend clinic?
                   □ Every 6 months
                   □ Every Year
                   □ Other (Please specify)
                   __________________________

2) What is this patient’s diagnosis?
                   __________________________
                   __________________________

3) Did this patient have a procedure carried out today?
   □ Yes (Please Specify)
   __________________________
   □ No
### Appendix 4: ENT OPD Questionnaire Data

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<th># Return Pts</th>
<th># Mastoid Pts</th>
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<th>F/U 6/12</th>
<th>F/U 3/12</th>
<th># MAT</th>
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Appendix 5: Pilot Clinic PDSA Cycle

Direct Access: Mastoidectomy Follow-Up Clinic

A PDSA Cycle for Quality Improvement

1. Plan: What will happen if we make a change?
   - Objectives
     I. Less return mastoidectomy patients seen in regular OPD clinic
     II. More new referrals seen in regular OPD Clinic
     III. Better continuity of care for mastoidectomy patients
     IV. Better access to specialist care for new patients in regular OPD clinic
   - Questions
     I. Will this plan improve patient experience?
     II. Will there be staff to run the clinic?
     III. Will the time be sufficient?
     IV. Will access to microscopes and consultation rooms be available?
     V. Will this clinic slot be permanently available for use?
     VI. Will patients be available for this pilot at short notice?
   - Predictions
     I. Patients frequently attending for follow up (≥ 12 months) will be able to come to clinic.
     II. Mastoidectomy patients experience an improvement in the quality of care delivered during their appointment.
     III. Patients will not experience delays during their appointment.
     IV. Staff will be satisfied with the new routine.
     V. The number of patients seen in pilot clinic will be equal to the number of new patients that could have been seen in regular OPD clinic.
   - Plan
     ✓ The creation of a dedicated clinic for patients attending OPD for lifelong/long-term follow-up after mastoidectomy surgery in order to create a more direct access route and better continuity of care and flow of clinic whilst creating more appointments for newly referred patients waiting > 12 months for an appointment in regular OPD.

2. Do: Let’s try it!
   - Carry out plan as outlined above
   - Document Problems Observed by PA student shadowing and following team feedback
   - Begin data collection: Patient Questionnaire, Data on the day

3. Study: Did it work?
   - Complete data analysis of Questionnaires
   - Compare to prediction: Measure time spent with each patient, flow of consultation, patient satisfaction, amount of patients seen etc.
   - Summarise findings as above

4. Act: What’s next?
   - Ready to implement? Does the plan need modification?
   - Try something else? Implement modification
   - Next PDSA cycle

TO DO:
I. Patient Satisfaction Questionnaire
II. Clinic Consultation Pro Forma

TEAM MEMBERS:
✓ Sponsor/Consultant
✓ Project Lead/PA Student
✓ Pilot Staff NCHD, Nursing Team, Secretarial Staff
✓ Other NCHDs sharing clinic on pilot day
Appendix 6: Mastoidectomy Clinic Pilot Patient Questionnaire

Thank you for taking the time to fill out this short, anonymous questionnaire as part of current research in [Hospital], which aims to evaluate the potential for a dedicated clinic for patients who have had mastoidectomy surgery and require ongoing follow-up appointments.

Please answer each question in full and return this form to the reception when you have finished.

1) Are you: Male □ Female □

2) What age are you?

3) How frequently do you normally attend this clinic?

4) How long ago did you have your Mastoidectomy operation(s)?

5) Did you feel you had to wait long for your consultation today?
   Yes □ No □

6) Were you happy to have your appointment rescheduled to today's clinic?
   Yes □ No □
   If you answered no, please specify why:

7) Are you usually seen by the Consultant □ or another Doctor □?
   Please specify:

8) Overall, were you happy with the care you received today?
   Yes □ No □
   If you answered no, please specify why:

9) Do you prefer to be seen by the same person at each visit?
   Yes □ No □ I don't mind □
   If you answered yes, please specify why:

10) Would you be willing to be seen by another, trained healthcare provider, such as a specially trained Nurse or a Physician Associate, in the future?
   Yes □ No □
   If you answered no, please give details:

11) Please leave any additional comments in the box below:

   ____________________________________________________________

   ____________________________________________________________

   ____________________________________________________________

   ____________________________________________________________

   ____________________________________________________________
### Appendix 7: Mastoidectomy Clinic Pilot Pro Forma

**Post Operative Mastoidectomy Review Checklist**

**Patient Label**

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**General Information**

**Indication for Surgery:**
- Cholesteatoma □
- CSOM □
- Other □
- Other □

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<tr>
<td>Side of Operation(s):</td>
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- Left □
- Right □
- Bilateral □

**History**

- Pain □
- Hearing Loss □
- Discharge □
- Infection □
- Tinnitus □
- Dizziness/Vomiting □
- Headache □
- Scars Well Healed □
- Patient Concerns □

**Otoscopic Examination**

- Cavity
  - Clean & Dry □
  - Infection □
  - Recurrent Disease □
- Wax
  - Mild □
  - Moderate □
  - Severe □

**Tympanic Membrane**

- Intact □
- Perforated □

**Middle Ear**

- Clear □
- Infection □
- Recurrent Disease □

**Atis:**

- Clear □
- Infection □
- Recurrent Disease □

**Medius**

- Adequate □

**Facial Ridge**

- High □
- Low □

**Sinodural Angle**

- Clear □
- Infection □
- Recurrent Disease □

**Mastoid Tip**

- Clear □
- Infection □
- Recurrent Disease □

**Overall Impression**

- Stable □
- Improved □
- Worse □

**Treatment:**

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Signatures:
Appendix 8: Mastoidectomy Clinic Pilot Pro Forma Continuation Sheet

Post Operative Mastoidectomy Review Checklist
(Continuation Sheet)

External Examination
Location of Scars:

__________________________
Well Healed? Y □ N □

__________________________

Otoscopic Examination
Signs of Cholesteatoma? Y □ N □
High Facial Ridge? Y □ N □
Signs of Infection? Y □ N □
TM intact? Y □ N □
Small Meatus? Y □ N □
Signs of CSF leak? Y □ N □

Cerumen:

Mild □
Moderate □
Severe □

Treatment:
__________________________
__________________________
__________________________

Signature:
__________________________