A Preliminary Evaluation of the Discharge Patient-Initiated Review (DPIR) Model for Hip and Knee Arthroplasty Review Care in NHS Scotland

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Executive Summary

This report presents a preliminary evaluation of the Discharge Patient-Initiated Review (DPIR), a service redesign by NHS Scotland under Scottish Committee for Orthopaedics and Trauma (SCOT) guidelines for hip and knee arthroplasty follow-up care. Evidence from local audits and peer-reviewed literature shows routine follow-ups for asymptomatic patients offer limited clinical value (Cassidy et al, 2019; Kingsbury et al, 2022; Scottish Government, 2022). DPIR replaces routine universal appointments with a patient-led model, empowering individuals to request review directly through a helpline, often leading to virtual consultations and reducing unnecessary face-to-face (F2F) clinic visits (Wood et al, n.d; SCOT, 2021).

A qualitative study was conducted across 6 NHS Scotland health boards (HBs) – Golden Jubilee (GJ), Highland, Forth Valley, Ayrshire & Arran and North Glasgow – using semi-structured surveys and in-depth interviews with consultants and arthroplasty practitioners – to evaluate DPIR's effectiveness in ensuring timeliness of review services, patient-centred care, and service efficiency. Additionally, to examine factors influencing its adoption and sustainability using the NASSS (Non-Adoption, Abandonment, Scale-up, Spread, Sustainability) framework (Greenhalgh et al., 2017).

This study aims to guide service improvements in DPIR for the Centre for Sustainable Delivery, enabling focused advisory support to HB on orthopaedic redesign and highlighting areas for future assessment and quality assurance at the HB management level. Presented below are the key findings and recommendations from the study for consideration.

Key Findings

Overall, clinicians view DPIR as effective in improving patient care by providing direct access to the arthroplasty team via a helpline after discharge from post-operative care, enabling timely triage and review. By reducing unnecessary appointments, DPIR frees capacity for patients with concerning symptoms requiring clinical review. However, several challenges emerged:

- Capacity pressures and workflow impact: APs managing the helpline and patient reviews reported pressures in higher volume HBs (GJ and Highland) due to rising surgical volumes and a lack of visibility to standard operating procedures, limiting their capacity. Some consultants noted that constrained AP capacity increases their review workload, creating inefficiencies.
- Data capture and governance: The electronic patient management system (TRAK) does not capture asynchronous helpline interactions, which constrains capacity planning and service monitoring.
- Inconsistencies in patient communication and local audit processes create barriers to timely identification of service delivery challenges and equitable patient engagement

Despite these challenges, DPIR adoption has continued due to its value in supporting timely patient-centred care and efficiency. Strong team coordination, peer mentorship, and managerial support enhance clinicians' engagement, although a lack of robust audit data can limit their confidence in the effectiveness of the service delivery.

Recommendations

- HB level: strengthen governance and quality assurance mechanisms while optimising helpline management and workforce capacity. It is critical that a minimum dataset is collected and reported to enable effective service auditing, trend identification and ensure consistent care.
- National level: Improve digital infrastructure and system-level coordination to assess and enhance equitable patient engagement with the DPIR service model.

Acknowledgements

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Special gratitude is extended to all IDI and survey participants for their time and for sharing valuable insights. Additional thanks are due to Professor Chris Gee, Associate Medical Director for National Elective Services within NHS Golden Jubilee, for facilitating access to survey participants, and the CfSD team for coordinating the IDIs across the participating Health Boards.

This report provides initial findings on key focus areas for improving service delivery under the DPIR model for both CfSD and the Health Boards and identifies opportunities for enhancing clinician engagement and operational efficiency of the service processes.

Acronyms

A&A	Ayrshire & Arran
A&E	Accident & Emergency
AAHKS	American Association of Hip and Knee Surgeons
AOA	Australian Orthopaedic Association
ASA	Arthroplasty Society of Australia
APs	Arthroplasty Practitioners
BASK	British Association for Surgery of the Knee
BOA	British Orthopaedic Association
CfSD	Centre for Sustainable Delivery
CH	Chapter
CHI	Community Health Index
COVID-19	Coronavirus Disease 2019
DNA	Did Not Attend
DPIR	Discharge Patient-Initiated Review
ED	Emergency Department
EU	European Union
F2F	Face-to-Face
FGDs	Focus Group Discussions
FV	Forth Valley
GGC	Greater Glasgow and Clyde
GIRFT	Getting It Right First Time
GJ	Golden Jubilee
GJ-FP	GJ Focal Person
GJNH	Golden Jubilee National Hospital
GPs	General Practitioners
GRI	Glasgow Royal Infirmary
HBs	Health Boards
HSI	Health Service Improvement
IDI	In-depth Interviews
IT	Information Technology
MHRA	Medicines and Healthcare products Regulatory Agency
NICE	National Institute for Health and Care Excellence
NASSS	Non-Adoption, Abandonment, Scale-up, Spread, and Sustainability
NG	North Glasgow
NHS	National Health Service
NIA	National Improvement Advisor
NICE	National Institute for Health and Care Excellence

NTC	National Treatment Centres
ODEP	Orthopaedic Data Evaluation Panel
OECD	Organisation for Economic Co-operation and Development
OOH	Outside Office Hours
PROMs	Patient Reported Outcome Measures
PHS	Public Health Scotland
PIFU	Patient-Initiated Follow-up
PIR	Patient-Initiated Review
PPF	Periprosthetic Fractures
QA	Quality Assurance
RE-AIM	Reach, Effectiveness, Adoption, Implementation, and Maintenance
RM	Realistic Medicine
SAP	Scottish Arthroplasty Project
SCOT	Scottish Committee for Orthopaedics and Trauma
SIMD	Scottish Index to Multiple Deprivation
SMs	Service Managers
SOPs	Standard Operating Procedures
WHO	World Health Organization
UR	Unplanned Revision
UK	United Kingdom

List of Exhibits

1.0. Study Introduction

This chapter outlines the background, objectives, and rationale for evaluating the DPIR service model for hip and knee arthroplasty in NHS Scotland, highlights evidence gaps, and describes key considerations informing the study design, concluding with the report structure.

1.1. Background

Hip and knee arthroplasties are among the most cost-effective elective procedures in orthopaedics, with demand continuing to rise due to an ageing population (Carr et al., 2012) (Daigle et al., 2012) (Jenkins et al., 2013) (Wilson et al, 2021) (Farrow et al., 2022). Annually, over 217,000 hip and knee arthroplasties are performed across the United Kingdom (UK), including approximately 17,000 procedures conducted in Scotland during 2024 (Public Health Scotland [PHS], 2025a).

Traditionally, post-hip and knee-arthroplasty care involved long-term, clinician-led follow-up and monitoring at 1 year, 7 years, and every 3 years thereafter, with radiographic imaging to detect implant-related complications early (BOA, 2012; British Association for Surgery of the Knee [BASK] et al., 2017; National Institute for Health and Care Excellence [NICE], 2020). As studies indicate that modern hip and knee implants can function effectively for 15–20 years or more in most patients (Bayliss et al., 2017; Burn et al, 2019; Evans et al, 2019), the routine follow-up approach—often called the traditional model (Ferdiandus et al, 2019)—created inefficiencies by requiring asymptomatic patients – i.e., patients with no concerning symptoms, often indicated by worsening pain, limited mobility or signs of infections (NICE, 2020) - to attend the routine appointments that added minimal clinical value. As returning patients consumed the majority of outpatient clinic capacity, timely care for patients with concerning symptoms was constrained, as they often had to wait for scheduled follow-ups due to a lack of available slots (NHS England, 2023).

A 2017 NHS Scotland local audit revealed that routine follow-up for asymptomatic arthroplasty patients was unnecessary, emphasizing the need for more efficient review care models (Scottish Government, 2022). Supporting this, a 2019 study also reported that asymptomatic patients with ODEP 10A rating implants could be safely discharged after their post-op review if a robust self-referral system was available, as revision surgeries were symptomatic and nearly all patients reported issues outside of routine follow-up appointments (Cassidy et al, 2019). Similar findings were reported by Wartermberg et al (2019).

Building on evidence from peer-reviewed literature and local audit, the Scottish Committee for Orthopaedics and Trauma (SCOT) issued guidance in 2019 that universal follow-up beyond the first post-operative review is not required following uncomplicated hip and knee replacements with ODEP 10A or higher-rated implants (SCOT, 2021). The guidance underlined redesigning services recommending patients with satisfactory recovery at post-op review be discharged to the Patient-Initiated Review (PIR) or DPIR pathway. This provides lifetime access to the arthroplasty review team at the secondary unit via a self-referral helpline for concerns or advice, as outlined in the Centre for Sustainable Delivery (CfSD) toolkit, aligned with SCOT's guidance (Wood et al, n.d) (SCOT, 2021). Unlike routine follow-up, DPIR empowers patients to initiate review when needed. Reported concerns can now be

first managed via a helpline and, if required, through virtual (phone/video) consultations, with F2F appointments offered only when clinically necessary or preferred by the patient (Wood et al, n.d). This approach eliminates unnecessary visits and imaging, frees hospital capacity, and thereby waiting time for clinically necessary cases to access care. Endorsed by the Chief Medical Officer, it was implemented nationwide by March 2020 (Wood et al, n.d).

Exhibit 1.1 – Routine Follow-up Vs DPIR Service Delivery Models: Feature Comparison

Key Features	Routine Follow-up	DPIR
First post-op review	F2F; 6-8 weeks post-surgery	Virtual; within 12 weeks post-surgery
Follow-up / review approach after post-op	Universal, long-term clinician-led follow-up.	Discharged to PIR pathway where clinically appropriate; patients re-engage via self-referral helpline with specialist care as needed.
Mode of consultation	Routinely scheduled F2F appointments at fixed intervals	Virtual consultation by default; F2F only when clinically necessary.
Radiological assessments/X-rays	Routine X-rays at fixed intervals	Only performed if clinically indicated.

Reference: BOA (2012), BASK et al (2017), SCOT (2021) and Wood et al (n.d)

1.2. Problem Statement

Despite its national adoption in Scotland by 2020, the DPIR service delivery model for hip and knee arthroplasty review care has not been formally evaluated. HBs were required to develop local Standard Operating Procedures (SOPs) in line with the principles set out by SCOT (2021) and CfSD (Scottish Government, n.d) (Wood et al, n.d) (See Exhibit 1.2). However, no systematic review has been conducted to assess how the model is functioning in practice, the effect on patients and staff, and its long-term sustainability within HBs and the wider health system.

Exhibit 1.2 – Key Principles for Implementing DPIR

- Development of local SOPs for DPIR delivery
- Direct communication with patients (copy to GP) with verbal guidance and written information provided on DPIR and concerning symptoms;
- Access to helpline without needing to contact a general practitioner (GP) for a referral;
- Discharge to PIR recorded as the clinical outcome for patients moved to the DPIR pathway on the electronic patient record (TRAK system);
- Regular process audit, especially when patients access clinical service; and
- Ideally no time limit i.e. open-ended access to helpline and review.

Reference: SCOT (2021) and Wood et al (n.d),

A lack of consolidated data further limits understanding of the model's operation. Key indicators—such as the number of patients discharged onto DPIR following post-op review, the proportion of patients re-engaging with arthroplasty team through the helpline, and support received—are not readily available at either local or national levels. Equally, patient perspectives remain undocumented, leaving uncertainty around patient satisfaction, accessibility, and whether DPIR effectively and equitably meets individual care needs in a timely manner when patients re-engage with the service. The transition to the DPIR model also required adjustments to staff roles, as is typical of redesign initiatives. Yet, little is known about how the workforce has experienced this change or the factors shaping their engagement with the model. In addition, possible variation in how HBs have structured and operationalised the pathway has not been examined. As a result, examples of good practice remain unrecognised, and barriers to both effective patient re-engagement and staff involvement are poorly understood

Together, these evidence gaps limit understanding of the DPIR model's effectiveness, equity, and sustainability, underscoring the need for systematic evaluation at both local and national levels.

1.3. Key Considerations for Study Design

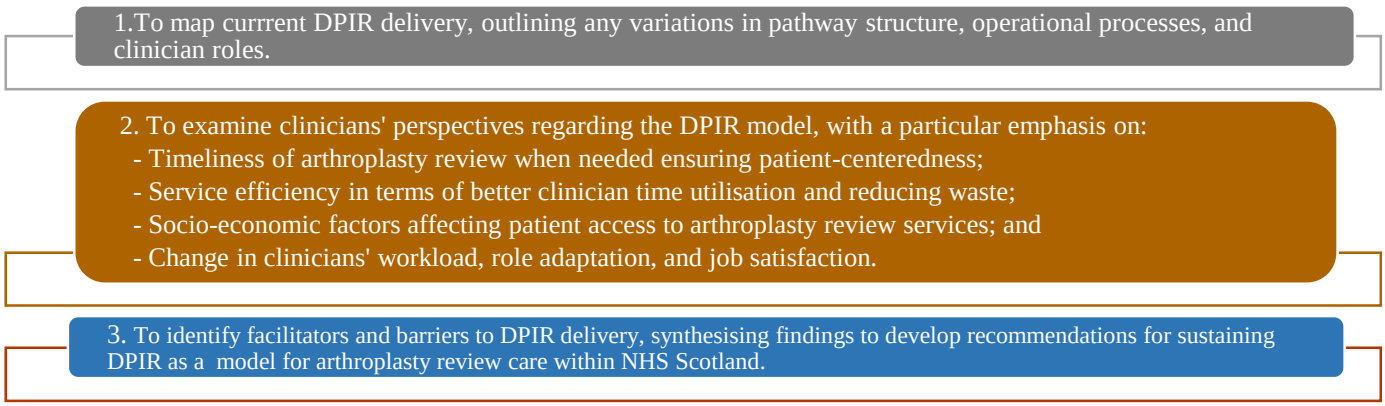
This study is designed within the constraints of access to data and NHS staff. Patient perspectives could not be collected due to lack of timely ethical approval, and secondary data could not be obtained because of delays in the NHS internal data review process. The DPIR model is primarily arthroplasty practitioner (AP)-led, supported by administrative staff within the arthroplasty review team and by consultants from the surgical team, with both teams overseen by service managers. Staff access for this study was selectively limited to clinicians, i.e. APs and consultants. Consequently, the study's scope focuses on clinicians (APs and consultants') perspectives, addressing the key gaps identified in the problem statement that could be explored through this group. Future research should incorporate patient surveys, secondary data analysis of DPIR service and patient re-engagement data (outlined in Annexure 9.1), and broader workforce and patient perspectives to enable a comprehensive evaluation of the DPIR model for providing hip and knee arthroplasty review services.

1.4. Aims and Objectives

The DPIR model illustrates value-based healthcare by focusing on arthroplasty follow-up outcomes that matter to patients, while reducing waste in healthcare delivery (Scottish Government, 2022). By minimising unnecessary routine reviews for asymptomatic patients, it improves technical value— ensuring efficiency and freeing capacity for those with clinical needs. At the same time, patient-initiated reviews enhance personal value by enabling timely, patient-driven access to care when required (Scottish Government, 2022).

Building on this background, the present study evaluates the effectiveness of the DPIR model in selected NHS Scotland health boards. Using clinicians' perspectives, the study investigates whether DPIR enhances the quality of review services for primary hip and knee arthroplasty patients by improving timeliness, supporting patient-centred care, and promoting health system efficiency—key principles of health service quality (WHO, 2018) and Realistic Medicine, essential to delivering the value-based healthcare vision of the Scottish Government (Medicine, n.d). In doing so, the study assesses how effectively DPIR delivers responsive, high-quality arthroplasty review care while promoting sustainable, value-based service delivery. The study's specific objectives are presented below.

Exhibit 1.3 - Study Key Objectives



1.5. Rationale and Significance

The recent UK SAFE study (Kingsbury et al., 2022), analyzing 350,000 hip and knee arthroplasty cases from the UK's National Joint Registry (2009–2016), demonstrated that routine follow-up between 01 and 10 years after primary, non-complex arthroplasty is safe, provided patients have rapid, readily available, access to orthopaedic review. Building on this evidence, the BOA updated its 2023 guidelines (GIRFT and BOA, 2023), recommending that patients be placed on the patient-initiated follow-up (PIFU) pathway after their post-operative review, allowing access via telephone or web-based triage. While the effectiveness of PIFU - also termed open access, patient-led, and patient-triggered follow-up (Kingsbury et al, 2022) - has been evaluated in musculoskeletal and other medical services (Sherlaw-Johnson et al, 2024) (Younis et al, 2024) (Pope et al, 2024) (Poggenborg et al, 2021) (Goodwin et al, 2016), their application in arthroplasty remains under-researched. UK SAFE highlighted this gap and emphasized the need for studies examining local follow-up models to assess their effectiveness in delivering rapid access to arthroplasty review services.

This study positions DPIR as a local model for delivering review care, using clinicians' insights to assess its perceived effectiveness and sustainability across sampled Scottish HBs. By examining variations in local practices, it provides evidence on the potential successes and challenges of DPIR in arthroplasty care. While UK SAFE explored staff perspectives of arthroplasty follow-up care practices, this was limited to the English NHS. In contrast, this study captures local staff perspectives on both the traditional follow-up and the patient-initiated review model as implemented in NHS Scotland. Although statistical insights on equity, service efficiency, and cost-effectiveness are beyond its scope due to limited access to data, the study is an initial step emphasizing the need for future research to address these critical areas. Understanding the local implementation of DPIR is also particularly important given rising surgical volumes in Scotland, compounded by long-standing waiting time pressures that peaked during the COVID-19 pandemic due to widespread postponement of elective surgeries, creating significant backlogs (Carr et al, 2021) (Yapp et al, 2021) (Farrow et al, 2022) (Jabbal et al, 2024) (See Exhibits 1.4 and 1.5). Government investment in 2024 has driven record surgical volumes (Scottish Government, 2024), reaching the highest levels in Scottish history (PHS, 2025; see Exhibit 1.6), with targets including a 50% increase in procedures and 150,000 additional NHS appointments by 2026 (Scottish Government, 2025 and 5). Therefore, ensuring the DPIR pathway provides timely and safe access to care is therefore critical for maintaining patient safety and sustaining outpatient services.

Ultimately, this study will inform policy and practice for providing rapid access to arthroplasty review within NHS Scotland by supporting CfSD in reviewing the current DPIR model, identifying areas for improvement, and guiding collaboration with HBs at both national and regional levels. The findings will provide actionable insights for service managers by highlighting staff challenges and resource considerations. Additionally, the study offers potential for comparison with PIFU models as implemented in the English NHS, following updated 2023 BOA guidelines (GIRFT and BOA, 2023).

Exhibit 1.4 – Total Hip Arthroplasty Volume and Waiting Times (1998 – 2021)

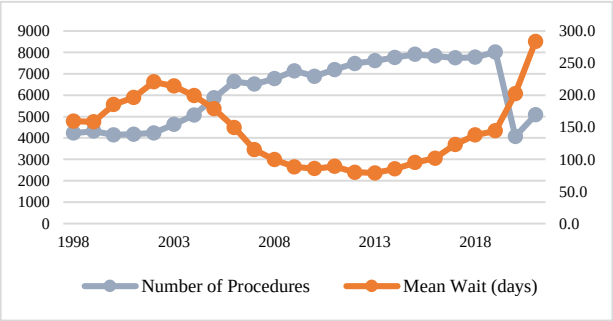
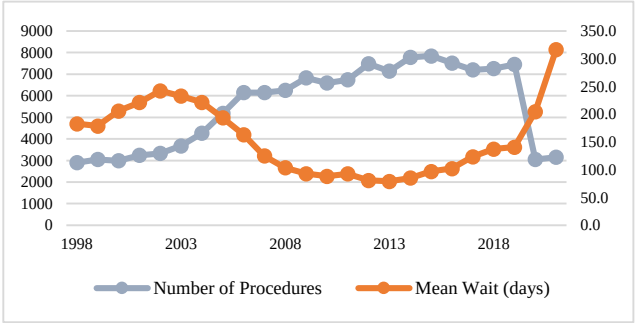
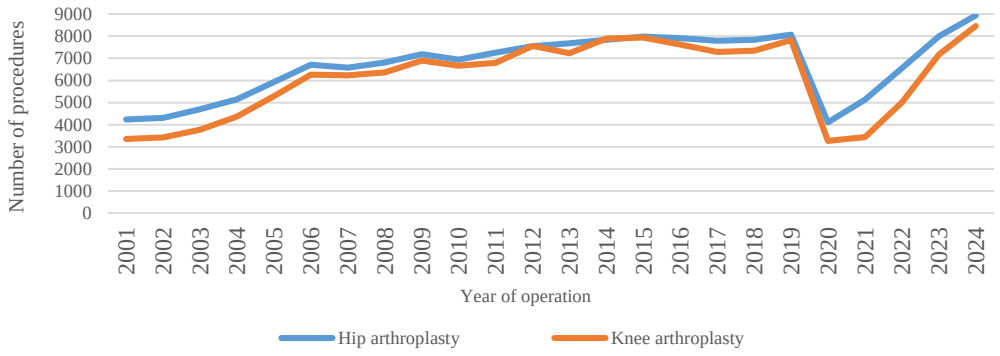


Exhibit 1.5 – Total Knee Arthroplasty Volume and Waiting Times (1998 – 2021)



Reference: (Jabbal et al, 2024)

Exhibit 1.6 – Primary Hip and Knee Arthroplasty Procedures Per Year (2001-2024)



Reference: PHS (2025b)

2.0. Literature Review

DPIR follows the patient-initiated follow-up model in which patients can request follow-up/review appointments when they feel they are needed, rather than attending routine, pre-scheduled appointments at fixed intervals (NHS, 2022). This approach addresses key limitations of traditional outpatient follow-up systems, where some patients may require earlier intervention than their next scheduled appointment but are unsure how to contact their clinical team, or face long waits even if they do. Conversely, others may be asked to attend routine appointments during periods of stability, which can lead to unnecessary inconvenience and increased anxiety for patients (NHS, 2022).

Within the framework of Realistic Medicine, patient-initiated care models support a personalised and patient-centred approach by enabling patients to access specialist care when it matters most to them (Medicine, 2025). This enhances the personal value of healthcare—defined by the outcomes and experiences that are most important to individuals—which is one of the four pillars of value-based healthcare in the NHS Scotland vision (Scottish Government, 2022). Improving personal value is closely interconnected with improving the technical value of the health care system, the second pillar of the value-based healthcare ecosystem. By aligning service provision with individual patient needs and timing, patient-initiated care models help reduce waste in outpatient delivery (Scottish Government, 2022)—specifically the use of clinical time, appointments, and resources for follow-up that offers little value to clinically stable patients.

While there is evidence on the effectiveness of patient-initiated care models in improving service and patient outcomes across various medical specialties—including rheumatology, oncology, and gynaecology (Pope et al, 2024 Sherlaw-Johnson et al., 2024; Younis et al, 2024)—and on the efficacy of PIFU clinics in secondary care settings (Taneja, S'ua and Hill., 2014), its application within the orthopaedic subspecialty of arthroplasty care remains under researched (Smith et al., 2019; NICE, 2020; Kingsbury et al, 2022). Within this context, this section reviews existing studies, highlighting key developments in the evidence base that supports the transition from the traditional follow-up approach to a patient-initiated review model for hip and knee arthroplasty, whilst maintaining patient safety. Building on these findings, this study evaluates the DPIR model in NHS Scotland, examining its perceived effectiveness, service delivery challenges, and sustainability, thereby addressing gaps in the literature on the implementation of patient-initiated care models in arthroplasty.

The search strategy for this section focused on studies published between 2017 and 2025, including relevant articles cited within the identified sources. Searches were conducted using PubMed and MEDLINE databases, and the review was limited to studies published in the English language. The following keywords and their variations were used in the literature search, combined with Boolean operators AND and OR as appropriate: patient-initiated follow-up (PIFU), direct access, open access, self-referral, follow-up, arthroplasty, hip replacement, knee replacement, joint replacement, post-arthroplasty care.

2.1. Rethinking Routine Follow-Up in Arthroplasty

Patient safety, defined as the prevention of harm during healthcare delivery through systems and practices that minimise risk (WHO, 2018), has long been a core principle in arthroplasty care. The traditional follow-up model,

previously mandated by national orthopaedic association bodies, was characterised by its reliance on surveillance: all patients underwent scheduled clinical assessments and radiographic imaging at fixed postoperative intervals (1 year, 7 years, and every 3 years thereafter) (BOA, 2012; BASK et al., 2017), regardless of symptom presentation. This surveillance-driven approach aimed to identify complications in asymptomatic patients at an early stage, enabling timely intervention and thereby preventing avoidable harm and acute revision surgery (Engh et al., 2001; Clohisy et al., 2004; Smith, 2014; Burn et al., 2018; Loppini et al., 2022).

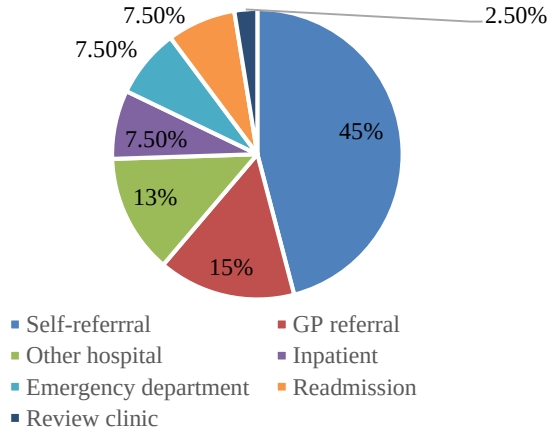
The 2022 UK SAFE Study, commissioned by the National Institute for Health and Care Research (NIHR), concluded that for ODEP 10A prostheses it is safe to discontinue routine follow-up during the 1- to 10-year period after non-complex hip and knee replacements—procedures involving well-studied implants in patients not considered high risk for complications—provided patients have prompt access to orthopaedic review through self-referral if needed (Kingsbury et al., 2022). This conclusion was supported by three lines of evidence:

Limited Role of Routine Follow-ups in Identifying Revision Cases

Kingsbury et al. (2022, chapter [ch]. 5) through a single-institution cohort study in the UK involving 568 hip and knee arthroplasty patients undergoing revision surgery, demonstrated that routine orthopaedic appointments and radiographic surveillance played a limited role in identifying patients requiring revision. The arthroplasty patients were classified into two groups: those who underwent planned revision (PR) through routine follow-up, and those who required unplanned revision (UR), typically identified outside a structured orthopaedic pathway, such as via the emergency department (ED). Patients in the UR group exhibited higher rates of periprosthetic fractures (PPF), dislocations, and infections, which are generally acute, symptomatic complications that often arise without prior radiographic warning, as also noted by Zimmerli (2014) and Ramavath et al (2020). Consequently, these patients are likely to seek immediate care through emergency services, irrespective of routine follow-up schedules.

When cases involving PPF, dislocations, and infections were excluded, most patients in both the UR and PR groups experienced pain that could have prompted a review for the UR group if patients had the option to directly self-refer to the arthroplasty team without needing to wait for their routine appointment (Kingsbury et al., 2022, ch. 5). Such a pathway could also reduce emergency department visits and ease unnecessary system burden, as highlighted by Sherlaw-Johnson et al. (2024) in their study of PIFU models in the English NHS, although their findings did not cover sub speciality-specific outcome. These insights underscore the need to understand the barriers and facilitators to timely self-referral to arthroplasty teams when such a pathway exists. Given that the DPIR model is designed

Exhibit 2.1 - Methods by Which Patients were Referred for Revision Surgery



Reference: Cassidy et al (2019)

around this principle, this study will explore, from the clinician's perspective, the challenges patients encounter and whether aspects of its design or delivery influence patients' direct engagement with the arthroplasty unit.

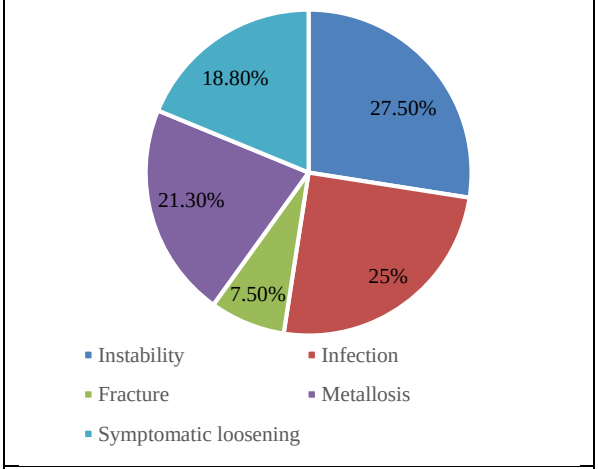
Kingsbury et al. (2022, ch. 5) findings on the limited value of routine orthopaedic follow-up are supported by other studies. Cassidy et al. (2019), in a Northern Ireland study focusing on hip arthroplasties, found that of 80 revision cases, only 2 (2.5%) were detected during routine clinic visits; the majority self-presented (45%) or were referred via general practitioners (15%), other hospitals (13%), or emergency departments (~8%) (see Exhibit 2.1). The results suggest that routine follow-up is of limited effectiveness, as patients often present with concerns at times outside scheduled appointments. Similarly, Jacob et al. (2015) reported that among 2,969 knee arthroplasty patients, only 18 (0.6%) required reoperation, and none were identified through routine one-year follow-up. In most cases, patients had already presented with symptoms, such as stiffness, prior to their scheduled review.

Risks for Revision Surgeries

Analysing 330,784 hip and knee replacement records from the National Joint Registry, UK, Kingsbury et al. (2022, ch. 3) reported a low incidence of revision procedures—4.6% for knee arthroplasty and 2.5% for hip arthroplasty. Revision risks were primarily determined by individual health conditions, including comorbidities, medication use, and surgical and implant factors, such as the use of metal-on-polyethylene bearing surfaces (Kingsbury et al, 2022, ch. 5). These findings address the longstanding concern that asymptomatic aseptic implant loosening could lead to complex revisions, a key issue highlighted by the NICE Committee (2020) regarding the discontinuation of routine follow-ups. Kingsbury et al. (2022, ch. 3) showed that revision risks are largely predictable and almost exclusively associated with symptomatic presentation.

Earlier studies support these findings. Cassidy et al. (2019) reported just 80 revisions out of 4,802 patients (1.6%), all occurring in symptomatic patients who presented with clear concerning symptoms (see Exhibit 2.2), while no asymptomatic patients required revision. All patients had ODEP10A-rated implants, for which no cases of silent loosening were observed. Similarly, Hacking et al. (2010), analyzing 110 hip arthroplasty revisions from the Australian Orthopaedic Association National Joint Replacement Registry, found that 96.4% of mid-to-late term (5–10 years) revisions were prompted by symptoms, predominantly pain, with only 3.6% occurring in asymptomatic patients, all involving older-generation polyethylene. The risk of asymptomatic loosening has become increasingly rare with the widespread use of highly cross-linked polyethylene liners, which substantially reduce the incidence of silent osteolysis—a previously common cause of late revision (Atre et al., 2017; Gaudiani et al., 2018). A systematic review of post-arthroplasty follow-up studies also indicated that the support for routine surveillance was largely based on pre-2000

Exhibit 2.2 - Reasons for Revision Surgery



Reference: Cassidy et al (2018)

data, when implant designs were less durable (Smith et al., 2019). Since then, advancements in implant technology—with 10- to 20-year survivorship rates between 85% and 95%—and improved surgical techniques have further reduced the risk of undetected complications (Bergstein et al., 2024).

Overall, the findings show that arthroplasty revision rates are low, with identified determinants, and mainly linked to symptomatic presentations or acute events, such as fractures or dislocations, while the likelihood of asymptomatic complications is minimal with modern implants and surgical techniques - strengthening the confidence in discontinuing the routine follow-ups for asymptomatic patients.

Low Incidence of Revision in No Follow-Up Group

Despite being scheduled for routine clinical assessments and radiographic imaging, fewer than 50% of patients attended their follow-up appointments, according to datasets from the Clinical Practice Research Datalink – Hospital Episode Statistics (Kingsbury et al., 2022, ch.7). Revision rates were generally low across all groups and were significantly lower in the no-follow-up group (Kingsbury et al, 2022, ch.7).

For knee arthroplasty, revision rates in the follow-up group were 5.2% for patients aged <70 years and 2.0% for those aged ≥70 years, compared with 1.0% and 0.4% in the no-follow-up group (Kingsbury et al, ch.7). For hip arthroplasty, rates in the follow-up group were 4.2% for patients <70 years and 1.9% for those ≥70 years, versus 1.8% and 1.1% in the no-follow-up group (Kingsbury et al, 2022, ch.7). The findings further emphasised that revision events in the no-follow-up group were rare and were primarily prompted by symptoms such as pain and impaired function, which indicated the need for revision (Kingsbury at al, 2022, ch.7). Similar findings were reported by Pinedo-Villanueva et al. (2023), supporting the analysis of Kingsbury et al. (2022, ch. 7), and emphasizing the role of surgeons in effectively identifying which patients require long-term follow-up, rather than providing universal follow-up to all patients.

Low attendance at follow-up appointments has been a persistent challenge in arthroplasty care across multiple countries. Similar to the British Orthopaedic Association, other professional bodies—including the American Association of Hip and Knee Surgeons (AAHKS), the Australian Orthopaedic Association (AOA), Arthroplasty Society of Australia (ASA) and the Netherlands Orthopaedic Association (NOA)—have recommended routine follow-up, although these recommendations have largely been based on consensus rather than robust evidence, as highlighted by systematic reviews (Smith et al., 2019; Loppini et al., 2022). Reported “did not attend” (DNA) rates were high, with 41% of patients not attending their 1-year appointment and 35% not attending their 2-year appointment (Barrack et al., 2020; Clohisy et al., 2008). Many patients did not attend because they did not perceive a need, and studies found no significant differences in clinical outcomes between patients who attended follow-up and those who did not (Obadare, 2003; King et al., 2004; Yoon et al., 2021; Kingsbury et al., 2022, ch. 7).

Considering the low incidence of revision cases—primarily associated with symptomatic presentations—and low follow-up attendance, routine follow-up appointments place a considerable burden on both healthcare systems and patients. A U.S.-based study found that most patients either called to cancel the day before or did not show up, resulting in 71 unused appointments, equivalent to roughly two full days of clinic sessions per year, assuming a daily

patient volume of 35 (Jacob et al., 2015), thereby occupying slots that could be used for patients in need of care. Also, on average, a routine visit consumes 4.13 hours (SD 2.19) of a patient's time (Jacob et al., 2015). The financial impact is further amplified by direct costs related to travel and the visit itself (Barrack et al., 2020). Implementing a self-referral pathway, where patients access care upon concerning symptoms, aligns with value-based healthcare, which focuses on maximizing health outcomes for patients relative to the resources when it matters to them (European Union [EU], 2019; Scottish Government, 2022). By enabling patients to seek care when clinically necessary, unnecessary routine appointments—and the associated travel burden—are avoided. This improves efficiency by reducing wasted clinical capacity, eliminating the possibility of unused appointments, and freeing clinic slots for patients who truly need care, particularly given advances in modern surgical techniques and implant durability. The approach enhances patient experience, optimizes resource utilization, and maintains safety by ensuring timely access for symptomatic patients. Overall, it supports a service model that delivers high-value care—achieving better outcomes and minimizing unnecessary use of clinical resources.

2.2. Updated Post-Arthroplasty Care Guidelines from BOA

The key distinction between PIFU in England and PIR in Scotland lies in the interpretation of "discharge." In NHS Scotland, arthroplasty patients who meet recovery milestones at their first postoperative review are discharged to the PIR pathway—referred to as the Discharge Patient-Initiated Review (DPIR) pathway—but remain within secondary care indefinitely. This provides patients with a lifelong self-referral pathway to secondary care without requiring a new GP referral if symptoms or concerns arise (Wood et al., n.d.; SCOT, 2021). In contrast, in England, patients are discharged from secondary care 1-5 years after their surgery (NHS England, 2023).

PIFU in England aligns with PIFU pathways designed for short-term care episodes, such as physiotherapy, where follow-up is limited and patients are discharged based on clinical status (Sherlaw-Johnson et al., 2024). By contrast, chronic conditions, such as rheumatoid arthritis, often combine PIFU with fixed recall appointments to ensure ongoing monitoring aligned with disease activity and treatment response (Sorensen et al., 2015; Poggenborg et al., 2021). Unlike the indefinite DPIR model in Scotland, the applicability of time-limited PIFU for arthroplasty patients in England remains uncertain. The 2023 BOA guidelines do not specify a time limit for patient-initiated contact, meaning patients may still need to access secondary care via the GP if concerning symptoms arise after five years. As highlighted by UK SAFE study (Kingsbury et al, 2022), discontinuing routine follow-up is only considered safe when a self-referral pathway is in place.

A key aspect requiring consideration is the UK SAFE study's recommendation for the long-term follow-up beyond 10 years. However, the BOA guidelines and locally adapted PIFU and PIR models do not currently address this period. While the 10-year timeframe in UK SAFE was primarily determined by data limitations—a point acknowledged by the study—national and regional bodies should clarify the pathway as the 10-year cut-off is arbitrary and may be impractical for a predominantly older patient population.

2.3. Gaps in Understanding the Implementation of Patient-Initiated Care Models

Currently, no studies have examined patient-initiated care pathways in the context of arthroplasty. While PIFU guidelines are available in the UK, comparable guidance is lacking in other countries, where recommendations largely continue to emphasize traditional routine follow-ups (NOA, 2018; AAHKS, 2019; AOA, 2006; ASA, 2019). Although NHS England has published a comprehensive PIFU guide, evaluations of its implementation and effectiveness within arthroplasty services have not yet been reported.

Furthermore, as highlighted in several studies, complete disinvestment from routine follow-up does not appear to be widely practiced. Instead, alternative models are being explored for cost-effectiveness, particularly virtual review clinics in which patients undergo radiographic assessment and complete patient reported outcome measures (PROMs) remotely - minimizing the need for patients to attend F2F clinics (Palmer, 2019; Preston et al, 2019; Preston et al, 2023, Platt and Bolland, 2025). These PROMs and imaging results are subsequently reviewed by clinicians remotely to inform ongoing care. PROMs are standardized questionnaires completed by patients at various intervals to assess symptom burden, perceived health status, and overall wellbeing (Dawson et al, 2010). The role of PROMs as a reliable component of safety netting is subject to ongoing evaluation as concerns persist about the responsiveness of PROMs data for timely identification of postoperative complications or deterioration, as well as the associated costs and resource implications (Fisher et al, 2019) (Spece et al., 2025). Studies have demonstrated that PROMs provide limited additional clinical value beyond the early postoperative period, particularly after six months, providing a plateau effect (Giesinger et al, 2014; Ramkumar et al, 2018; Canfield et al, 2019; Piuzzi et al, 2022; Seetharam et al, 2022) Given that PROMs primarily provide subjective assessments of symptomatic conditions such as pain, instability, and range of motion (Rolfson and Malchau, 2015; Ramkumar et al., 2018) and considering that patients have a dedicated pathway to timely access the secondary care, the added value of collecting PROMs for clinical surveillance warrants reconsideration under the context of PIFU. Similarly, routine radiographs have been documented to provide limited clinical value in follow-up care, largely due to their low diagnostic yield leading to minimal influence on subsequent clinical decision-making (Aghayev et al., 2013; Hart et al., 2021; Ponsworno et al., 2024).

Within this context, this study examines DPIR as an alternative model for delivering review care to arthroplasty patients, assessing its clinical relevance and exploring barriers to implementation, focusing initially on clinicians' perspectives. The Greenhalgh et al (2017)'s Non-adoption, Abandonment, and challenges to the Scale-up, Spread, and Sustainability (NASSS) framework will be used, given its comprehensive ability to evaluate service redesign innovations—including adoption, sustained use, risks of abandonment—while linking individual, organisational and wider systemic factors to value generation in healthcare (Greenhalgh et al., 2017). Other frameworks such as RE-AIM (Reach, Effectiveness, Adoption, Implementation, and Maintenance) (Holtrop et al., 2021) also address adoption but focus primarily on time-limited interventions in community settings (Shaw et al., 2019), making them less suited to ongoing service innovations and limited data contexts. In contrast, NASSS has been successfully applied to PIFU evaluations in gynaecology and breast cancer services within the English NHS (Sherlaw-Johnson et al.,

2024), reinforcing its relevance for this study. Its categories also align with those in other implementation frameworks, such as the Consolidated Framework for Implementation Research (Damschroder et al., 2009; Sherlaw-Johnson et al., 2024). Alternative evaluation frameworks, including NICE health technology guidelines (NICE, 2025) and the OECD evaluation framework (OECD, n.d), are less applicable, as NICE primarily assesses clinical and cost-effectiveness, while OECD focuses on broad socio-economic programmes rather than the organisational and systemic complexities of healthcare innovations such as D-PIR/PIFU.

3.0. Approach and Methodology

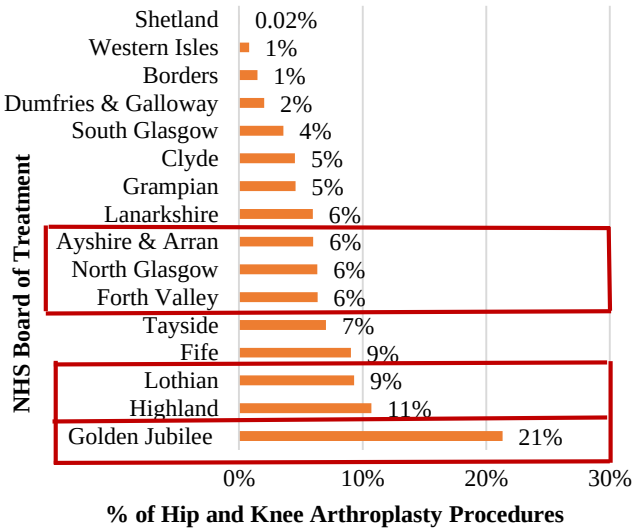
This chapter presents the study's methodology, outlining the research design, theoretical framework, data collection methods and limitations.

3.1. Research Design and Rationale

This study used a qualitative design with semi-structured surveys and in-depth interviews with clinicians. Limited data on DPIR service outcomes and patient engagement (see Section 1.3 and Annexure 9.1) necessitated a qualitative approach to explore clinicians' experiences and perceptions, capturing the complexities of DPIR at the regional HB level to inform recommendations to optimize the use of DPIR in delivering arthroplasty review care within NHS Scotland.

While focus group discussions (FGDs) are also a qualitative method, they were not feasible for this study due to practical challenges of coordinating clinicians' availability given their clinic commitments and annual leave schedules. FGDs within HBs or clinician groups across HBs during non-clinic periods could be considered in future research to capture group-level dynamics, including inter-professional communication and peer influence, providing insights that individual interviews cannot fully reveal.

Exhibit 3.1 – Study Geographic Coverage based on 2024 Arthroplasty Procedure Distribution (and Participant Availability)



Reference: PHS (2025b)

3.1.1. Study Setting and Sampling

The Golden Jubilee National Hospital (GJNH), part of NHS Golden Jubilee (GJ) and performing the highest proportion of hip and knee arthroplasty procedures in Scotland (approximately 21%; see Exhibit 3.1), was selected as the primary site for administering the semi-structured survey, targeting all 22 consultants and 5 APs in the arthroplasty team. Due to limited access, IDIs were not conducted with these participants. Participation invitations were extended to other HBs, with timely responses received from 05 high-volume orthopaedic units, each from NHS Lothian, Forth Valley (FV), North Glasgow (NG), (Greater Glasgow and Clyde - GGC), Ayrshire & Arran (A&A) and Highland (including NTC)—based on surgical volumes comparable to GJNH (see Exhibit 3.1). IDIs were scheduled with available APs, with consultant availability primarily at NHS GGC. Given participants' limited availability and last-minute confirmations, IDIs were considered the most suitable method, allowing in-depth exploration of DPIR adoption for arthroplasty review while accommodating practical scheduling constraints.

With GJ included, the study sample spans seven of the fifteen NHS boards (with selective coverage of NHS GGC focusing on NG), representing clinicians from orthopaedic units contributing to ~58% of all hip and knee arthroplasty procedures conducted in NHS Scotland (2024 figures; see Exhibit 3.1). This provides a strong basis for understanding DPIR model across relatively high-volume orthopaedic units in NHS Scotland; however, the findings may not be fully representative, and future research should include the remaining HBs to capture wider variation at the national level.

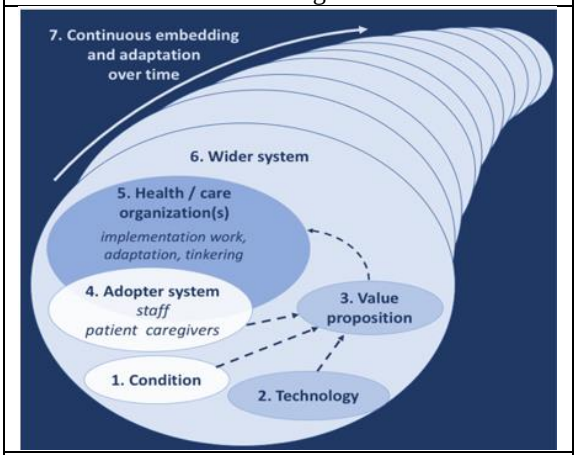
3.2. Conceptual Framework

This study is guided by the NASSS developed by Greenhalgh et al. (2017). NASSS provides seven interrelated domains (Exhibit 3.2) that offer a structured lens to

examine the complexity of adopting and sustaining technology-enabled service redesigns in healthcare. In this evaluation, NASSS is applied to analyse clinicians' insights on the DPIR model, which replaces routine arthroplasty follow-ups with a patient-initiated self-referral pathway supported by virtual consultations, reducing unnecessary F2F appointments. The focus is on assessing the effectiveness of DPIR in delivering timely, patient-centred care while advancing value-based healthcare through Realistic Medicine (RM) and health service improvement principles (Medicine, n.d; WHO, 2018).

Effectiveness is closely linked to adoption, as innovations achieve impact only when they are clinically appropriate, usable within workflows, meaningful to clinicians, and supported across organizational and system levels. NASSS is leveraged to identify adoption enablers and barriers and to evaluate how these dynamics influence clinicians' engagement with DPIR in practice (see Exhibit 3.3).

Exhibit 3.2 - The NASSS Framework for considering influences on the adoption, nonadoption, abandonment, spread, scale-up, and sustainability of patient-facing health and care technologies



Reference: (Greenhalgh et al., 2017)

The **condition** domain documents clinicians' view on the model's appropriateness for hip/knee arthroplasty patients, while also considering socio-cultural factors that shape patient engagement. The **technology** domain examines usability, workflow integration, and reliability of the helpline and virtual consultations' technology. The **value proposition** domain recognizes the overlap between RM and health service improvement (HSI) principles and evaluates how DPIR delivers benefits by reducing system waste (efficiency) and supporting patient-centred care through shared decision-making, individualized care, and risk management. HSI adds an explicit focus on timeliness, emphasizing reduced delays in care. Although secondary data on wait times are limited, clinician perspectives help gauge rapid access in terms of helpline responsiveness and timely consultation/appointment with appropriate member of the arthroplasty team for review. Equity and unwarranted variation, central to RM and HSI, are addressed through socio-cultural factors affecting patient engagement (condition domain), with deeper assessment requiring patient re-engagement data linked

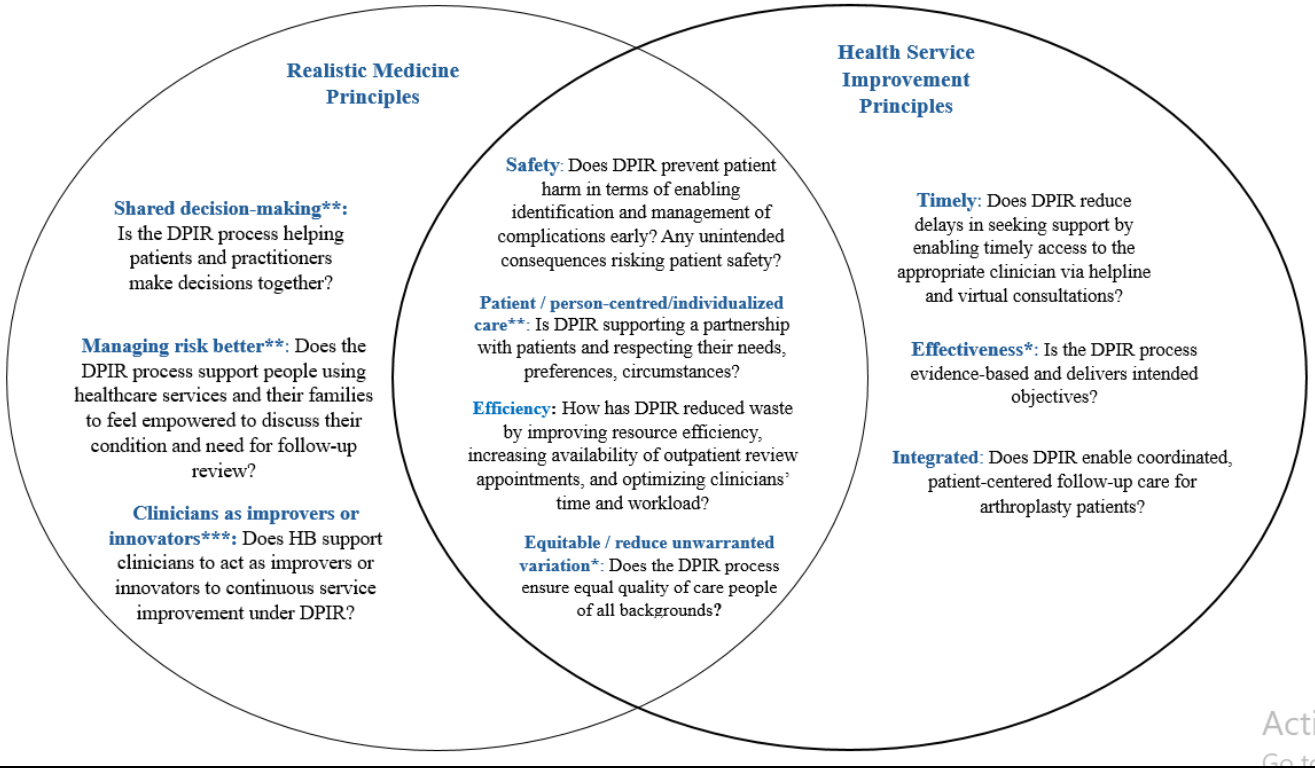
to Scottish Index to Multiple Deprivation (SIMD, n.d). **Adopter System** explored shifts in clinician roles, confidence in reduced follow-up care, and barriers to engagement. The **organisation** domain assessed support and challenges for sustaining the model at HB-level. The **wider system** domain addresses policy and national service redesign influences. Finally, the **embedding and adaptation over time** domain reflects long-term sustainability, coordination across HBs, and DPIR's implications for integration with other levels of care, aligning with WHO's system-level integration principle (WHO, 2018) essential for overall improvement of health service delivery. (See Annexure 9.2 for rationale for using WHO principles)

Overall, the seven NASSS domains provide a framework to assess how DPIR drives cultural change, moving beyond traditional patient safety—focused solely on preventing harm through routine follow-up—toward a holistic view of high-quality care. This includes technology use, redesigned process and shifts in clinician roles to create an environment (WHO, 2021) that reduces patient harm through timely, patient-centred care via helpline use and virtual consultations, fostering shared decision-making and patient empowerment (Edusei et al, 2017). NASSS is applied to identify factors supporting DPIR in enabling such an environment, where practices are continuously adapted to sustain safe, effective, and holistic care.

Exhibit 3.3 - Integrated Evaluation Framework for DPIR (Realistic Medicine × WHO × NASSS)

NASSS Domain	Sub-Domains	Evaluation Focus (in the context of DPIR)
1. Condition	Patient health condition and socio-cultural factors	DPIR and clinical complexity, along with socio-cultural influences affecting patient re-engagement with the arthroplasty service: clinician views
2. Technology	Key features, knowledge and/or support required to use the technology	Assess clinicians' experiences with the helpline and virtual consultations, focusing on usability and workflow integration
3. Value Proposition	Desirability for patients, clinicians and health system	Assess clinicians' views on timeliness, resource efficiency, accessibility, patient-centeredness, while identifying any concerns or unintended safety risks (refer to Exhibit 3.3.1)
4. Adopter System	Evolving staff roles, practices, and professional identities	Assess staff confidence in undertaking remote interactions, identify key barriers and facilitators affecting clinicians' engagement with DPIR
5. Organisation	Capacity to innovate, readiness for change, funding, changes in team interaction, roles and responsibilities	Identify Health Board–specific challenges and required support for DPIR delivery, including opportunities for clinicians to act as innovators and service improvers (see Exhibit 3.3.1)
6. Wider System	Policy, funding, and sociocultural context	Identify systemic pressure or structural barrier that influence DPIR delivery.
7. Embedding and Adaptation Over Time	Scope for adapting and coevolving the technology use and the service over time and resilience to adapt with unforeseen events	Identify factors influencing continued use or potential discontinuation; explore clinicians' perceptions of long-term sustainability and adaptability of DPIR.

Exhibit 3.3.1 - Areas for evaluation of the DPIR process for arthroplasty patients

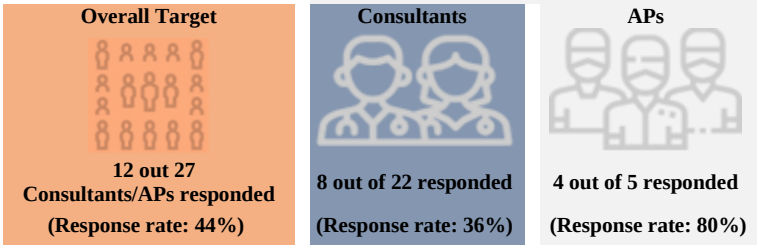


*These aspects require secondary data analysis and are not explored in depth; effectiveness focuses on clinicians' views of timely, patient-centered, efficient care; ** Patient-centered care integrates individualized care, shared decision-making, and risk management, forming a holistic perspective on care delivery; ***Not explored in depth, as it would require insights from service managers, to which access was limited.
Reference: (Medicine, 2025) (WHO 2018)

3.3. Data Collection, Ethical Considerations and Quality Assurance

The data collection period ran from 3 July to 19 August. A digital semi-structured survey (see Annexure 9.3) was developed on Microsoft Forms and hosted on the GJ platform. The link was circulated via email by the NHS GJ focal person (GJ-FP) to consultants and APs. Consultant response was below 50% (see Exhibit 3.4), mainly due to vacation and clinical commitments as communicated by GJ-FP, resulting in an overall response rate of ~44%. Consent was obtained through the survey form.

Exhibit 3.4 – GJNH Survey Target and Response Rate

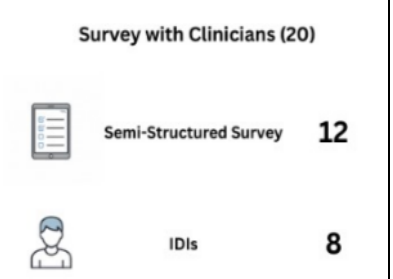


An IDI guide (see Annexure 9.4) was used to engage APs from other health boards, achieving a ~66% response rate (see Exhibit 3.5), with non-participation largely due to leave. A separate IDI guide was also prepared for interviewing available consultants (See Annexure 9.5). Consent was obtained via email. Overall, the duration of IDIs on average spanned from 25 minutes to 40 minutes, due to limited availability of clinicians. A discussion meeting was also held with the National Improvement Advisor (NIA) and Clinical Advisor, CfSD—who oversee orthopaedic redesign initiatives including DPIR—to gather insights on workflow optimization and implementation challenges facing DPIR.

Quality assurance included reviewing semi-survey responses for completeness and clarifying inconsistencies with the GJ-FP, counted as a stakeholder meeting, as direct participant access was not available. IDI responses were verified with participants via email due to CfSD policy prohibiting recordings. All survey and IDI notes were stored securely at CfSD organizational platform with a copy on University of Strathclyde Microsoft OneDrive (see Annexure 9.6 for IDIs/meeting participant list).

Exhibit 3.5 – IDIs with APs

Exhibit 3.6 – Overall data collection
(clinicians include both consultants and APs)



3.4. Data Analysis Approach

The semi-structured survey employed a five-point Likert scale, from strongly agree to strongly disagree, as recommended by CfSD based on their prior experience, to assess clinicians' perceived value and adoption (Koo and Yang, 2025), of the DPIR model. Open-ended responses were included to capture more nuanced perspectives, otherwise uncaptured with sole dependence on structured questions (Heo et al., 2022). Five-point scales were chosen for their lower cognitive demand, minimizing respondent fatigue in busy orthopaedic settings (Streiner, Norman and Cairney, 2015) (Koo and Yang, 2025). Survey responses were summarized descriptively by Likert category and respondent group (consultants vs. APs), as the small sample size did not allow for statistical analysis. Qualitative analysis was conducted using open-ended survey responses and IDI discussion notes, which were not audio-recorded. Consequently, software-based thematic analysis and verbatim reporting could not be undertaken for IDIs, and a manual analysis approach was used instead. Survey and IDI findings were organized in Excel by NASSS domains, with thematic categories examined alongside interdependencies between domains to assess DPIR adoption, effectiveness, and long-term sustainability among HBs, keeping in perspective wider-system level dynamics.

3.5. Key Limitations

This evaluation of the DPIR model is based on a small sample of clinicians (APs and consultants) and may not fully reflect wider views, particularly those of consultants. No patient survey was permitted, resulting in the absence of patient perspectives. Limited access to service data further constrained assessment of performance, process effectiveness, and the application of NASSS-informed realistic medicine and healthcare quality domains. The study focuses solely on the DPIR pathway for non-complex arthroplasty patients; follow-up for complex or non-ODEP cases, which varies by clinician discretion and BOA guidelines, remains outside scope. A separate study would be required to map all arthroplasty follow-up pathways and related service constraints across orthopaedic units.

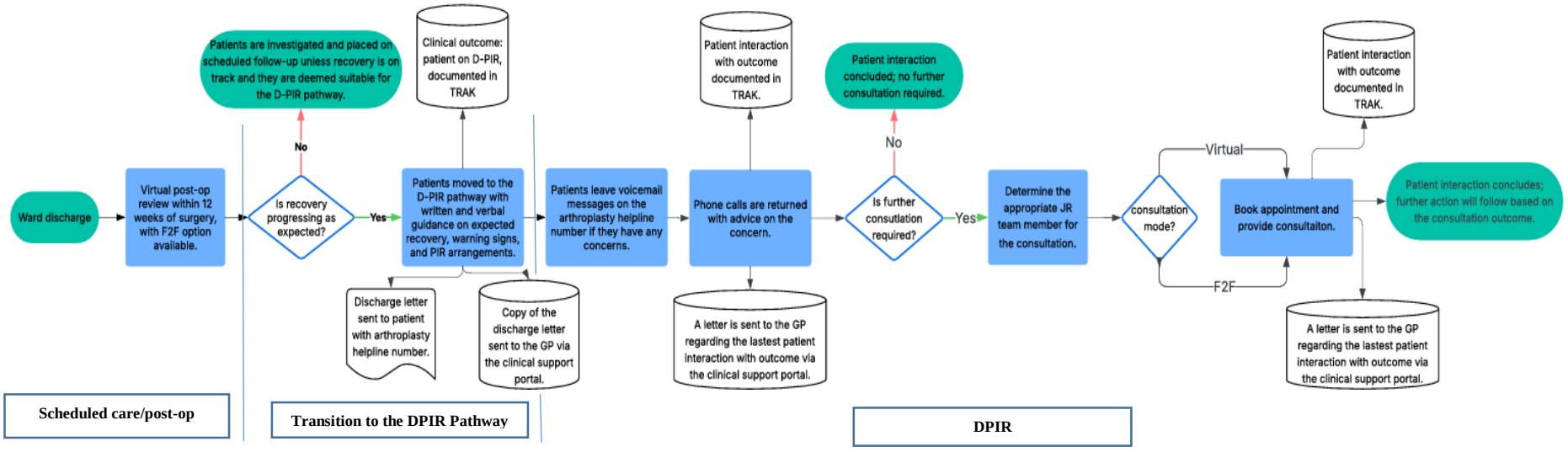
4.0. Findings

This section, organized into sub-sections, presents findings from semi-structured surveys and IDIs with clinicians (APs and consultants) across HBs, alongside stakeholder meetings, mapping the arthroplasty review process under DPIR and assessing the effectiveness of the process.

4.1. DPIR Process (and Clinician' Responsibilities)

Exhibit 4.1 outlines the overall arthroplasty review process for uncomplicated hip and knee patients, from scheduled post-op assessments through the DPIR pathway to patient-initiated re-engagement (DPIR), based on SCOT (2021) and CfSD (Wood et al., n.d.).

Exhibit 4.1 – Arthroplasty Review Process' Design Characteristics Under DPIR



Reference: SCOT (2021) and Wood et al (n.d)

Of 06 surveyed HBs, 02 (GJ and A&A) lacked SOPs for operationalizing the review process under DPIR, while respondents at other HBs reported being unaware of any. Staff accounts highlight variations in pathway structuring, summarized in Exhibit 4.2. Differences primarily exist in post-op care, where internal consultant consensus within each HB determined the review process they consider appropriate to assess patient readiness for discharge onto the DPIR pathway. Upon discharge, the process broadly follows design specifications and principles (Exhibit 1.2), transitioning patients to the DPIR pathway based on post-op recovery and recording DPIR as a clinical outcome in TRAK, the electronic patient management platform. Lifetime helpline support is provided, with concerns first addressed via virtual consultations and F2F appointments offered as needed or requested. Telephonic consultations are standard, except in Highland, where video consultations are delivered using the NHS Near-Me platform. Across HBs, inconsistencies in documenting helpline interactions, virtual consultations, and written patient information,

coupled with absent or limited staff awareness of SOPs, highlight areas requiring attention. Helpline use also warrants review, as patients reportedly access it pre-operatively via the patient booklet, reducing its specificity to DPIR. Uniquely, GJ reported that scheduled post-op care continues after DPIR, indicating ongoing long-term monitoring through PROMs and no complete disinvestment, contrary to the model proposed in DPIR.

The arthroplasty review process is primarily AP-led. APs conduct scheduled (6–12 weeks) and urgent post-op reviews, manage helpline calls, handle virtual or F2F consultations, and triage patients to consultants as needed. In GJ, APs mainly oversee post-op reviews, but most DPIR consultations are triaged to consultants due to AP capacity constraints from rising post-COVID joint volumes, as reported in the survey. Consultants remain engaged across HBs to determine which patients can be followed up by APs and placed on the DPIR pathway, and to provide clinical support when APs require guidance as patients re-engage with the service. Administrative staff primarily handle booking. In A&A, they also staff the helpline and triage calls to APs, while in FV, they assist with recording patient outcomes in TRAK.

Exhibit 4.2 – A Summary of Variations Identified in Arthroplasty Review Process Implementation among Surveyed HBs

	SCOT and CfSD Guidelines	Process Implemented at NHS Boards of Treatment As Reported by Surveyed Clinicians					
		GJ	**Highland**	**Lothian**	**FV**	**NG – GGC**	**A&A**
	Key characteristics						
Scheduled/ post-op care	Virtual post-op review within 12 weeks' post-surgery.	- Daily X-ray review meeting to assess the previous day's surgical cases (led by consultants); - PROMs within 12 weeks of the survey*; - Telephone-based post-op review between 6-12 weeks' post-surgery.	- Video-based post-op review between 6-8 weeks of post-surgery.	- Telephone-based post-op review within 6-8 weeks' post-surgery.	- F2F post-op review at 6 weeks' post-surgery.	- Telephone-based post-op review within 6-12 weeks' post-surgery.	- F2F post-op review between 6-8 weeks of post-surgery; - Virtual clinic: X-rays and PROMs' review at 1 year.
Transition to DPIR	Patients are discharged on the DPIR pathway (based on post-op review).	Most patients transition to the DPIR pathway after their first post-op review, typically within 12 weeks, if recovery milestones are met; others remain in scheduled care for further follow-up until deemed ready for DPIR.					Patients are placed onto the DPIR pathway after a 1-year virtual clinic review.
	DPIR status is recorded in TRAK as a clinical outcome.	DPIR status is consistently recorded in TRAK for patients moved to the DPIR pathway					
	Patients are provided with verbal and written information (through DPIR leaflet).	Upon discharge to DPIR, patients primarily receive verbal guidance on expected recovery, which symptoms to report, and use of the helpline to report concerning symptoms, seek advice or request reviews at any time. However, no dedicated DPIR leaflet exists. The helpline number is included in pre-op patient booklets; APs provide contact cards during F2F post-op reviews reiterating the helpline number, while virtual reviews refer patients to the booklet. Booklets from most HBs were unavailable for review. Online booklets were available from Lothian and Highland and were noted to include the helpline number but do not provide information on open-ended DPIR support for advice or reviews. These findings highlight inconsistency between verbal and written guidance and a heavy reliance on verbal instructions across HBs.					
	Discharge letters to patients (with a digital copy to GP)	All HBs send discharge letters to patients, with copies to GPs via the clinical support portal.					
DPIR	Open-ended self-referral helpline number access (asynchronous voicemail)	All HBs provide open-ended helpline access with voicemail, except A&A where it is staffed by a secretary (Monday–Friday). Outside office hour (OOH) and emergency contacts are in the patient booklet and reiterated during post-op review call/visit. OOH calls are managed by the orthopaedic ward staff in GJ and Highland, whereas dealt on the next working day among other HBs. Further, all arthroplasty reviews are self-referrals, with patients able to initiate contact without GP involvement. Patients reportedly use the helpline even before being placed on DPIR, as the number is included in the pre-op booklet.					
	All clinical interactions after patient contact are recorded in TRAK with a digital letter to GP.	APs reported that scheduled virtual and F2F consultations are recorded with a GP letter, while helpline interactions—often for reassurance or self-management guidance—are mainly documented manually. Recording virtual consultations in TRAK requires workarounds, as the system is designed for F2F consultations. In Highland, local software is used to document all patient (helpline + consultation – virtual/F2F) interactions, while GJ uses Excelicare for helpline interactions, though both are not integrated with TRAK.					
	No long-term monitoring	- PROMs at 1 and 3 years, and beyond*.	No long-term monitoring				

*** No response was received from GJ regarding who manages PROMs, how they are rolled out and recorded.**

4.2. Perspectives on the DPIR Review Process for Arthroplasty Patients

This sub-section presents clinicians' insights and stakeholder meeting findings on the perceived effectiveness of the arthroplasty review process under the DPIR model, assessed using the NASSS framework. Verbatim reporting is limited to GJNH, as IDIs from other boards were not recorded.

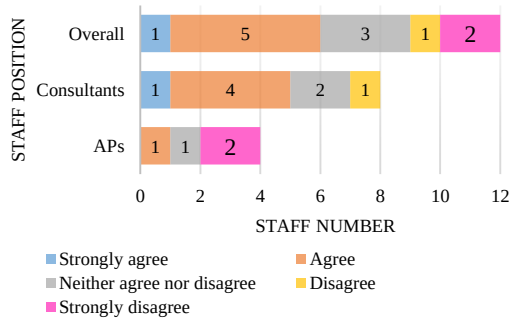
4.2.1. Suitability for Arthroplasty Patients

All clinicians regarded DPIR as appropriate for most primary arthroplasty patients, noting that most are discharged to the PIR pathway after the first post-op review or, in A&A, following a 1-year virtual review. Clinicians expressed confidence in BOA- and MHRA-compliant implants, which they reported ensure reliable long-term outcomes and reduce the need for routine follow-up. Complications generally present with clear symptoms (e.g., pain, swelling, reduced mobility) and are traditionally reported via A&E, GP, or hospital appointments, while DPIR's direct-access model enables prompt review. Patients with delayed recovery remain in scheduled care until post-op milestones are met, and complex or revision cases follow BOA-aligned consultant-led schedules. APs in A&A did not recall identifying any complications in the 1-year PROMs or X-rays and viewed extended follow-up as consultant-driven to monitor their surgical outcomes rather than clinical need, supporting discharge to the DPIR pathway after a satisfactory post-op review.

Most clinicians identified direct patient engagement with the arthroplasty unit as a key DPIR challenge. Patients often contact GPs because they forget that they have direct, lifelong access to the arthroplasty team, doubt it actually works in practice, do not fully understand how it works, are already seeing their GP, or prefer care closer to home—particularly in GJ and Highland, where patients travel long distances[1]. However, reliance on primary care professionals were noted to result in suboptimal outcomes for some cases, as recently observed in Highland.

Socio-cultural and equity factors also hinder patient engagement. APs noted that older patients often do not leave voicemail messages, and patients with hearing or speech impairments face challenges using the telephonic helpline. Some mitigation exists: A&A provides email contacts, Lothian flags patients who require additional support, and language barriers are addressed through F2F appointments with interpreters, with A&A also reporting use of the "language line" - a tele-interpretation service for patients with limited English proficiency. Overall, perceptions of equity were mixed: 50% of survey respondents agreed that DPIR is equitable, while the rest were neutral or disagreed (see Exhibit 4.3). IDIs emphasized the need to assess the effectiveness of existing measures in addressing equity-related barriers to improve patient engagement with DPIR. Overall, clinicians emphasized reinforcing patient use of the direct-access pathway. APs reported limited data on

Exhibit 4.3 – Responses by Staff Position at GJ for Q: *Is the DPIR process equitable?*



Source: Staff survey – Q19.6

[1] It is to note that, as national-level facilities, GJNH and NTC in Highland do not have territorial catchment areas and serve patients referred by local NHS hospitals across NHS Scotland (NHS GJ, n.d.; NHS Inform, n.d.). Thereby patients have to travel long distances for their surgeries and any required F2F review.

direct versus GP-referred contacts, highlighting the need for an internal review for developing targeted patient-engagement strategies.

4.2.2. Technology Use, Skills, and Systems Supporting DPIR

Across most HBs, telephone consultations via the NHS phone line were the primary mode of virtual consultations, valued for ease of use, reliability, and minimal technical requirements compared to the NearMe video platform. Limited IT support and APs' concerns about technical errors constrained NearMe adoption, while in GJ, poor video quality—due to patient device limitations and variable internet connectivity—led to its discontinuation, as reported in stakeholder discussions. Highland was an exception, where patient demand to avoid long travel and widespread HB-level familiarity with NearMe supported its continued use, as highlighted by the AP respondent.

APs reported that telephonic assessments for post-op recovery, consultation evaluations, and helpline advice were initially unfamiliar, as most had prior experience primarily in F2F care. However, GJ APs also noted low confidence in telephone interactions, particularly with distressed patients, and emphasized the need for targeted training, reflecting continued challenges in the use of technology in clinical workflows. Other HBs reported leveraging peer mentorship to develop questioning techniques for interpreting patient self-reports over telephone, highlighting how team-based learning supported technology adoption and staff confidence in its use. FV and A&A described a hybrid approach, retaining F2F post-op reviews but conducting routine consultations by telephone, escalating concerns to F2F when needed. A Lothian AP respondent reported that annual consultant-led competency checks enhanced preparedness and confidence, highlighting the importance of institutional support in sustaining the use of technology.

Many calls provide reassurance and guidance on self-management, and APs emphasized the need for clear guidance on how a clinical interaction is recorded —particularly those requiring GP letters. As explained by APs, TRAK is primarily designed to document pre-planned patient encounters in a F2F clinic setting rather than unpredictable, immediate helpline interactions. Robust call-logging, time-stamping, and documentation of clinicians' notes, outcomes, advice, and follow-up actions—currently missing from TRAK—are essential to ensure proper record-keeping and patient safety.

Local databases (Excelicare in GJ, Orthowave in Highland) and manual diaries are used to log helpline interactions (voicemails received, returned calls and their outcomes), but these are not linked or entered into TRAK, leaving patient-initiated contacts and much of APs' activity throughout the patient journey unseen and unrecorded. In addition, TRAK cannot directly capture virtual consultations, and variations in TRAK versions across HBs create inconsistent documentation, as noted by NIA, CfSD. These gaps indicate that a substantial portion of staff effort is not visible in the main patient record system, which may obscure true workload and reduce recognition of APs' productivity across the DPIR pathway.

4.2.3. Value Proposition

4.2.3.1. Service Efficiency

Most survey respondents (75%) regarded DPIR as improving service efficiency compared with traditional follow-up (see Exhibit 4.4), a view supported by IDIs, which noted that routine follow-ups often generated unnecessary clinic visits, considered wasteful appointments. Consultants in IDIs particularly valued APs' role in triaging patients to the appropriate JR team member, reducing waste by preventing unnecessary clinician appointments and keeping clinician schedules available for patients who need them, thereby shortening waiting times. Cases manageable remotely are addressed via the helpline or virtual consultations, with asynchronous communication allowing patients to report symptoms as they arise, many resolved without face-to-face appointments. This approach reduces unnecessary hospital visits, optimises face-to-face appointment capacity, staff time, and clinical resources, and ensures prompt access for patients requiring review, reinforcing DPIR's overall efficiency.

Exhibit 4.4 – Responses by Staff Position at GJ for Q: *Is the DPIR process efficient?*

Source: Staff survey – Q19.3
Note: Other Likert scale option ('Disagree') was available, but received zero responses, and is therefore, not shown in the chart.

Operational Pressures on APs in Higher-Surgical-Volume HBs

Higher-surgical volume HBs, GJ and Highland, face operational pressures from rising JR surgeries and increasing DPIR patient numbers, affecting service efficiency - contributing to 50% of GJ APs (see Exhibit 4.4) disagreeing and 50% of consultants constraining strong agreement or staying neutral with the reported service efficiency benefits under DPIR. APs in these HBs reportedly handle up to 50 and 17 helpline calls per day, respectively, compared with 6–10 per week in lower-volume HBs, limiting them to focus mainly on post-op review cases while managing helpline calls and prompting unnecessary consultant reviews for DPIR patients in GJ, as informed during the stakeholder discussions.

> "The arthroplasty team have not expanded despite expanding surgical numbers, which generates more demand for their time. As arthroplasty team are under-resourced, the automatic for any issue is to be brought back to see their consultant (before the arthroplasty team would manage a lot more without need for consultant input), this just increases the review burden. Most reviews are for the 'worried well'"– Consultant (1), GJNH.

Highland plans to recruit an additional AP and implement time-limited DPIR reviews to ease this pressure. However, there is no local HB-level assessment of helpline data to determine whether the higher call volume is directly due to DPIR patients, as non-DPIR queries—e.g. surgical waiting times—also occupy the helpline due to the number being shared as part of the pre-op patient booklet. While the prevailing consultants and APs' perception attributes the increase in helpline calls to DPIR demand, it may instead reflect suboptimal helpline management. The absence of an SOP, creating uncertainty around helpline role and management, represents a key operational challenge, as

emphasized by clinicians. A&A's model, where a secretary screens and forwards only DPIR-relevant calls to APs, was reported to improve workflow efficiency and reduce unnecessary burden of screening helpline calls.

Workload Visibility, AP Capacity, and Operational Efficiency

Inadequate documentation of returning helpline calls limits accurate assessment of AP capacity constraints, while also creating a productivity paradox where actual workload of APs may be underestimated. In GJ, while returning helpline calls are logged in a local database, key details—such as call duration and follow-up actions—are not part of the call log template, obscuring true workload, limiting visibility to bottlenecks in helpline management due to the absence of SOPs, and also underestimating clinical resource needs. Systems like Orthowave reportedly improve documentation, transparency, and evaluation of AP capacity and workflow efficiency; however, such tools are largely absent in other HBs, where manual logging further masks AP work activities/workload and constrains operational effectiveness.

> "Calls are lengthy and can require multiple emails and telephone calls to resolve - this is not demonstrated when we log a call i.e. one phone call takes over an hour to deal with." – AP (1), GJNH.

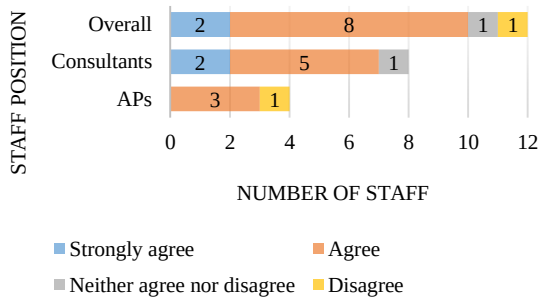
4.2.3.2. Timely Provision of Care

Helpline access

In DPIR, the helpline serves as the first point of contact. APs highlighted that prompt responses are essential to ensure optimal patient care, as well as to counter perceptions of long waits for follow-up care. Most HBs return patient messages within 24 hours, while GJ adds a safeguard requiring a second message if there is no response, offering patients greater certainty and reinforcing trust. Highland, citing capacity constraints (indicated section 4.2.3.1), provides only an open-ended assurance of reverting "as soon as possible." While this may create uncertainty for patients, the AP interviewed in Highland views it as realistic to avoid disappointment.

Helplines in all the HBs studied operate Monday to Friday, with OOH and weekend messages addressed the next working day – exceptions appear in GJ and Highland where OOH calls are to be routed to orthopaedic wards). However, APs reported limited visibility on how these calls are handled, recorded, and followed up, and these management processes are not currently scoped in the DPIR process design. This highlights a gap in care coordination that requires review and integration in the DPIR design to ensure responsiveness across the spectrum.

Exhibit 4.5 – Responses by Staff Position at GJ for Q:
I am confident that patients can book a timely appointment when required.



Source: Staff survey – Q12
Note: Other Likert scale option ('Strongly disagree') was available, but received zero responses, and is therefore, not shown in the chart.

Clinician Confidence in Timely Care

Clinicians generally view DPIR as improving the timeliness of care. Survey findings show that 83% (10/12) of respondents agreed that patients can book timely appointments, although strong agreement was limited (see Exhibit 4.5), a view also reflected in IDIs. Virtual consultations, a core component of DPIR, as explained during IDIs, are sometimes not

consistently recognised by patients as formal review, which may lead some to underestimate how quickly their concerns are being addressed. Nonetheless, by reducing routine follow-ups and triaging effectively, DPIR has optimized capacity, allowing F2F review appointments within 1-3 weeks, with urgent cases often seen sooner and same-day access available when needed – Consultants and APs described this timeliness as rapid, supported by prompt helpline responses. Unlike the previous system, where patients waited for scheduled appointments or presented via A&E, DPIR allows direct access to the arthroplasty review team, ensuring assessment by the appropriate clinician and timely, appropriate care.

Service Constraints Affecting Timely Access

However, IDI participants noted that clinics are now largely filled with patients presenting problems, so longer appointment times constrain the total number of reviews that can be provided. FV reported using support from the Fracture Liaison Unit and other clinics to maintain timely access when demand rises. In higher-volume settings, such as Highland, growing post-op caseloads can delay both scheduled 6–8 week reviews and review appointments. At GJ, cases manageable by APs are often transferred to consultants, and virtual consultation availability is unclear due to limited staff access and stakeholder discussion participants' insight. High-volume consultant clinics further restrict timely access. These capacity pressures (indicating clinic volume, appointment duration, AP capacity, consultant workload) likely explain why survey respondents expressed overall confidence in DPIR appointments, but strong agreement was limited and minor disagreement was reported among some APs.

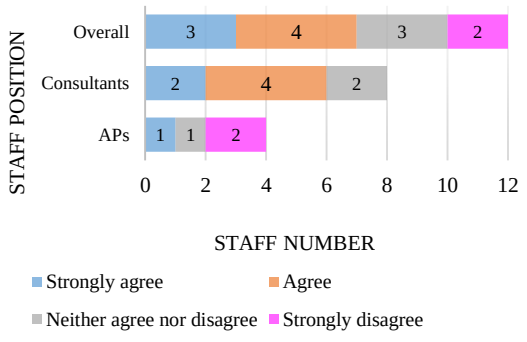
"most patients that contact the helpline post DPIR have been booked into consultant clinic review appointments, as numbers increased, this has been ongoing as arthroplasty have not had capacity to see these patients. The majority of patients' arthroplasty see in person are urgent appointments pre DPIR" – AP (3), GJNH

"[It is] more difficult to get appointments in some surgeon clinics as they are full" – AP (2), GJNH

4.2.3.3. Patient-centeredness

While the DPIR pathway is intended to support patient-centred care, survey findings revealed differing perspectives between consultants and APs. Most consultants (75%) valued DPIR for being patient-centred, reducing unnecessary travel for patients and providing remote support. However, 50% of APs disagreed, citing miscommunication during telephonic interactions leading to stress for both patients and clinicians, and reiterate equity-related factors, such as language barriers, compromising patient-centredness. Concern was expressed regarding over-reliance on GPs, potentially delaying early identification and management of complications (see Exhibit 4.7). A patient survey is needed to investigate the reasons behind perceived low engagement with the DPIR helpline, despite patients having direct access to the service.

Exhibit 4.6 – Responses by Staff Position at GJ for Q: *Is the DPIR process patient-centred?*

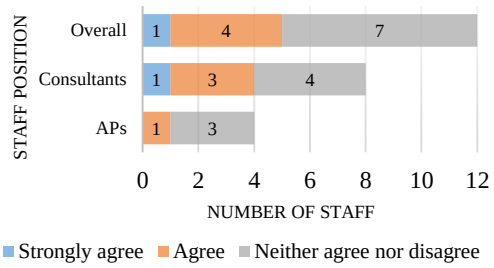


Source: Staff survey – Q19.4
Note: Other Likert scale option ('Disagree') was available, but received zero responses, and is therefore, not shown in the chart.

"there is often miscommunication or misunderstanding from patients on phone which can lead to stress from both parties" – AP (3), GJNH

In contrast, IDIs highlighted a more positive perspective: clinicians affirmed that DPIR supports patient-centred care, allowing most patients to resume daily life eliminating the anxiety caused by unnecessary follow-ups. The helpline enables APs to understand individual needs and provide tailored guidance, supporting confident self-management. APs reported that telephonic assessments rarely cause miscommunication, and F2F appointments are offered when needed.

Exhibit 4.7 – Responses by Staff Position at GJ for Q: *The D-PIR process allows us to identify and address complications early.*



Source: Staff survey – Q10
Note: Other Likert scale options ('Disagree' and 'Strongly Disagree') were available, but received zero responses and are therefore not shown in the bar chart.

Service Agreement Constraints and Patient Preferences

However, service agreements reportedly require patients to attend the unit where their surgery was performed—highlighted by APs at NTC managing pan-Scotland cases and FV also overseeing GGC patients—which can conflict with patients' preference for local care. While local units are contacted to accommodate these preferences, consultants generally do not assume care for patients operated on by other surgeons. Nonetheless, local arrangements for imaging reduce travel, and helpline interactions reportedly address patient concerns effectively, promoting engagement and partnership in their care. Limitations stemming from service arrangements may partly explain increased telephone-based activity at GJ (also discussed in subsequent sections), which may be managerially aimed at reducing F2F appointments. Overall, there is no barrier to F2F access, as noted by GJ-FP, but AP responses indicated a perceived barrier, which needs to be further explored through IDIs with them and service managers. NIA, CfSD noted that an unintended consequence of DPIR is the misconception that F2F appointments are entirely discouraged. Arrangements should be in place to ensure that patients continue to receive timely, high-quality care whenever in-person assessment is clinically required.

4.2.4. Adopters

Factors influencing sustained adoption of DPIR varied between consultants and APs.

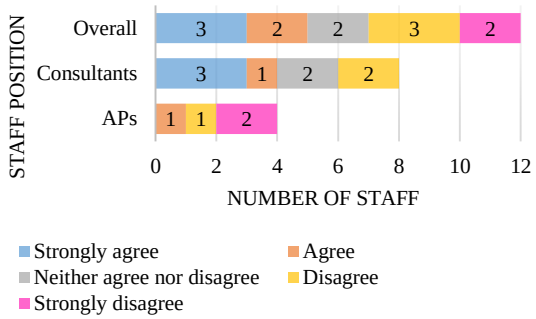
Determinants of DPIR Adoption Among Consultants

Among consultants, the central concern was robust evidence of its effectiveness. Some GJ consultants viewed the model as management-driven, emphasizing the need to ascertain patient engagement and team capacity to ensure safe implementation. GRI consultants valued the reduction in unnecessary reviews but stressed that reliable data are essential to build confidence in its safety and effectiveness.

> "DPIR was mainly introduced to combat massively expanding arthroplasty team workload, each time point was removed to help ease burden. There hasn't been a proper piece of work to ensure that DPIR works as intended" – Consultant (3), GJNH

Consultants widely reported that DPIR affected job satisfaction by reducing opportunities to see positive post-operative outcomes and interactions with 'happy' patients. In GJ, half of consultants expressed indifference or dissatisfaction with their work (see Exhibit 4.8). However, IDIs suggested that redefining job satisfaction around providing value care to patients who truly need attention could restore professional fulfilment and support sustained engagement.

Exhibit 4.8 – Responses by Staff Position at GJ for Q: *has the DPIR process made a noticeable positive difference to job satisfaction?*



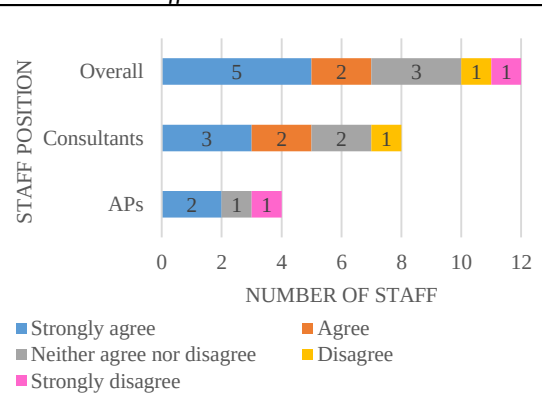
Source: Staff survey – Q18.4

IDI discussions with both APs and consultants highlighted that consultants' insistence on personally reviewing patients also contributes to late DPIR adoption, especially among new JR consultants onboarded on the team. Patients are eventually moved to DPIR, with APs managing reviews once volumes rise and consultants recognize that reviewing all patients personally is not feasible. In Highland, occasional questioning of APs' handling of complications was reported, reflected lingering mistrust, while in NG-GGC, where both consultants and AP were interviewed, successful adoption was linked to consultants trusting APs, providing clinical review support when requested by APs, and empowering patients through informed engagement as they are placed on DPIR.

Determinants of DPIR Adoption Among APs

Key factors influencing AP engagement with DPIR included professional identity. GJ APs reported feeling like "customer service representatives" due to helpline duties, which conflicted with their clinical role and reduced job satisfaction (see Exhibit 4.9). In other HBs, APs viewed helpline support as an extension of their clinical role, though the Highland respondent highlighted the need to streamline helpline management.

Exhibit 4.9 – Responses by Staff Position at GJ for Q: *has the DPIR process made a noticeable positive difference to workload?*



Source: Staff survey – Q18.3

"I am not trained to be a customer representative service. We spend all day on the telephone to patients who can be angry and irritate with ourselves due to no fault of our own. It is like working in a call centre" – AP (3), GJNH.

During IDIs, APs emphasized that strong team coordination fosters mutual trust and enhances their collective capacity to deliver DPIR effectively. Across HBs, APs adopted flexible working practices—adjusting how they manage tasks by integrating helpline duties with virtual consultations, sharing clinical and administrative responsibilities, and leveraging each team member's skills—which strengthened team cohesion and improved workload management. In contrast, in GJ, an AP reported long helpline hours, and 50% of APs expressed disagreement or neutrality regarding workload differences (see Exhibit 4.9). This, coupled with

limited training in managing telephone interactions and assessments (Section 4.2.2) and conflicts with clinical role identity, may create a compounded challenge to sustained DPIR adoption, particularly in GJNH.

"We do not move from our desks for up to 8 hours which is not conducive to good work, health dynamics" – AP (4) – GJNH

4.2.5. Internal Factors – Organization/Health Board

HB-specific factors shaped both DPIR adoption and perceived effectiveness, highlighting key organizational enablers and barriers. APs emphasized the role of managers in supporting innovations, such as triage clinics with reserved slots and liaising with other units (e.g., fracture liaison in FV), which improved patient flow and enabled APs to work confidently and collaboratively, ensuring patients received appropriate care. Adoption was further supported by collaborative on boarding, though GJ APs noted: "*The DPIR process was put into place; at no point was staff role, stress, and environment taken into consideration – AP (3) –GJNH*", illustrating how limited staff engagement can create frustration despite service implementation. Digital systems also influenced effectiveness: TRAK lacked consistent features for recording remote consultations, whereas Highland's Orthowave captured all interactions, enhancing visibility of AP work and patient outcomes. APs in other boards highlighted the need for robust documentation systems to reduce manual recording and clarify processes. Overall, organizational processes, leadership, and technological infrastructure directly shaped staff engagement, confidence, and the perceived effectiveness of DPIR.

4.2.6. External Factors – Wider System

APs in GJ and Highland reported that post-COVID government efforts to expand joint replacement (JR) volumes have increased workforce pressure. GJ operates with five APs, whereas Highland has only two—similar to lower-volume boards such as A&A and Lothian—highlighting a mismatch between workforce capacity and rising procedural demand.

National oversight of workforce planning for DPIR is limited, compounded by fragmented digital infrastructure. NIA and the Clinical Advisor, CfSD, noted that the TRAK system varies across health boards, with no national visibility of DPIR patient numbers or engagement. Consequently, reliance on local reporting of minimum datasets (see Exhibit 4.10)—which are not yet available—hampers coordinated planning. Remote DPIR interactions, intended to improve accessibility and patient management, are not captured in the current TRAK system, which is designed primarily for F2F clinic. This under-recognition of clinicians' activities limits accurate assessment of workload and productivity, undermining sustainability as JR volumes rise. Addressing this will require national-level investment to adapt TRAK to DPIR needs.

Exhibit 4.10 – Minimum Dataset Requirements (highlighted by NIA and Clinical Advisor, CfSD)

- The number of hip and knee replacements performed (excluding revisions)
- The number of patients who were placed on the DPIR pathway at the first post-op review
- The number of patients who contacted the service directly and there was a clinical interaction with a healthcare professional, a decision/plan was made,

Coordination between primary and secondary care remains a challenge, highlighted by both APs and consultants. Both reported cases of delays in referrals from GPs and district nurses, despite repeated guidance, resulting in suboptimal patient care. In Highland, it was reported that GPs sometimes use the helpline for referrals, contrary to its intended purpose, which further disrupts workflow and limits opportunities for primary-level management. Addressing these

issues requires identifying knowledge or practice gaps, implementing targeted primary-level interventions, and establishing systems to support effective care coordination.

4.2.7. Sustainability – Embedding and Adaptation Over Time

Stakeholder discussion meetings highlighted that COVID-19 facilitated DPIR adoption by accelerating remote consultations, normalizing telephonic follow-ups, and encouraging patients and clinicians to use the helpline for timely advice, maintaining continuity of care while reducing unnecessary hospital visits. Most clinicians did not offer specific suggestions for service improvement when prompted during IDIs. However, several key areas for sustaining and enhancing DPIR were identified and are documented in Exhibit 4.11. Overall, continuous embedding of the DPIR model depends on continuous evaluation, iterative refinement of resources, alignment of clinician practices with patient-centered care, and practices that support both patient needs and operational efficiency. Additionally, proactive staff succession planning ensures that institutional knowledge is retained, enabling DPIR to continue without disruption. By addressing these factors, DPIR can remain resilient, responsive, and effectively integrated into routine care, supporting long-term adoption and scalability (refer to Exhibit 4.11).

Exhibit 4.11 – Suggestions Received by Clinicians During IDIs

- **Data and evaluation:** Establish systematic monitoring to track patient engagement trends and evaluate the effectiveness of DPIR processes, ensuring evidence-based service improvements, as identified by GRI consultant.
- **Clinician attitudes**: Strategies to promote a cultural shift among consultants from paternalistic practices toward patient autonomy, emphasizing shared decision-making and self-management support, as emphasized by GRI consultant.
- **Patient-facing resources**: Review and update written materials, including the patient booklet, as identified by GGC AP, to ensure content—such as exercises—is current and supports patients' recovery and self-management
- **Time-limited DPIR and continuity**: Consider implementing a time-limited DPIR pathway, as many patients are older and may consult GPs for comorbidities over time. GPs should assess whether patients need referral back to secondary care, ensuring that only appropriate cases return and thereby relieving pressure on the helpline and secondary care service, as emphasized by Highland AP. Strong coordination is required to maintain continuity, with returned patients treated as follow-ups rather than new appointments and having readily available slots, ensuring seamless care while optimizing pathway duration, further reiterated by GGC AP.
- **Staff succession planning**: Plan for staff turnover with timely induction of new personnel, ensuring continuity of processes, as highlighted by GGC AP.

5.0. Discussion

The semi-structured survey and IDI findings show a general perception that the DPIR model enhances patient care and system efficiency. By reducing unnecessary routine follow-ups, it reportedly frees outpatient clinic capacity and provides timely access for patients re-engaging with the arthroplasty team. At the same time, it strengthens patient-centred care by tailoring reviews to individual needs and supporting shared decision-making through helpline consultations. This dual approach creates technical value (EU, 2019; Scottish Government, 2022) by reducing waste and optimising resources, and personal value (EU, 2019; Scottish Government, 2022) by aligning care with patients' circumstances and preferences. These outcomes reflect the principles of Realistic Medicine, which emphasise avoiding unnecessary interventions while delivering individualised care, with timeliness as a key quality marker ensuring rapid access to advice and review support (WHO, 2018). Although helpline responsiveness and appointment availability vary across HBs, both are consistently perceived as improvements compared with the traditional system. While consultants generally view DPIR favorably, APs in higher-volume units report operational pressures that affect the model's value proposition for them and reduce job satisfaction. The discussion that follows examines multi-level factors shaping DPIR adoption, effectiveness and sustainability.

5.1. Strengthening HB-Level Systems for Effective Service Delivery under DPIR

5.1.1. Quality Assurance

No formal monitoring mechanisms were observed to ensure HBs implement DPIR according to established principles, including the development of HB-specific SOPs. Of the six surveyed HBs, two confirmed that no SOP exists, and participants in the remaining four were unaware of any, highlighting a lack of clarity and consistency in SOPs (see Exhibit 5.1). While the Scottish Arthroplasty Project (SAP) under PHS monitors surgical outcomes (PHS, n.d), the lack of SOPs raises governance and quality assurance (QA) concerns. SOPs are essential for accountability, compliance, and effective monitoring of redesigned care processes underpinning patient safety (Manghani, 2011; Shestopalova & Gololobova, 2018; WHO, 2021; Ignite Health Systems, 2022; Zachary, 2024) under the DPIR model. Without SOPs, accountability for local audits cannot be established, necessitating engagement with service managers (SMs) to understand current QA processes and challenges in developing SOPs and conducting audits – as these audits generate evidence that consultants reportedly require to build confidence in DPIR delivery. Other key QA-related areas requiring attention, as identified in Exhibit 5.1, include the three outlined below:

Patient Messaging: SCOT and CfSD (SCOT, 2021; Wood et al, n.d) recommend combining verbal and written communication to ensure patients understand and retain how to access the direct service directly. APs explain helpline use and provide contact details verbally, but specific DPIR leaflets tend not to be provided during the post-op review. A review of HB websites revealed variation in DPIR messaging, suggesting potential for improvement (see Exhibit 5.2). There is a tendency to convey the impression of a busy service, reinforcing long-wait perceptions—a known barrier to patient-initiated engagement (NHS, 2022; Sherlaw-Johnson et al., 2024). Only GJ clearly outlines open-ended access, which may be contributing to higher helpline use. Variation in patient information on DPIR may

underline helpline use among patients in some HBs, and without staff access to SOPs, verbal information risks inconsistency; highlighting the need for standardized and adequate patient messaging across all communication channels.

Exhibit 5.1 - Adherence to Key principles for DPIR Delivery (as outlined in Exhibit 1.2) by Surveyed HBs

Key principles	Surveyed HBs					
	GJ	Highland	A&A	Lothian	FV	GGC
Development of local SOPs for DPIR	No SOP confirmed.		Study participants reported that they were unaware of their existence, CfSD also lacked access to SOPs, limiting its ability to verify its presence, given no access to SMs.			
Direct communication with patients (copy to GP) with verbal guidance and written information provided on DPIR and concerning symptoms.	**Communication with GPs**: Letters are reportedly sent to GPs for consultations and appointments documented in TRAK. **Verbal information:** Verbal information is reportedly provided regarding helpline use, including guidance on concerning symptoms and open-ended access for advice and review **Written information materials:** Physical patient booklets were not accessible, but a review of online booklets and website information revealed potential improvement, particularly in explaining DPIR (see Exhibit 5.2), indicating the need for review.					
Discharge to PIR recorded as the clinical outcome for patients moved to the DPIR pathway on the TRAK system	APs reported recording DPIR as a clinical outcome in TRAK.					
Access to helpline without needing to contact a general practitioner (GP) for a referral;	Although patients can access the helpline directly, it was reported that many continue to do so via their primary healthcare professionals (GPs, Extended Scope Practitioners) or other hospital units.					
Regular process audit, especially when patients access clinical service; and	No local audit was reportedly conducted to date, also confirmed in the case of GJ during the stakeholder meeting.					
Ideally no time limit i.e. open-ended access to helpline and review.	Currently, all HBs reportedly implement open-ended DPIR; however, APs in GGC and Highland reported considering time-limiting the patient contact, which remains under discussion.					

Exhibit 5.2 - Inconsistencies in Information Across Surveyed HBs' Websites

Digitized patient booklets are available for Highland and Lothian; however, neither explains open-ended access. Highland cautions: "*This service is very busy, so please leave a message and your call will be returned as soon as possible*" (NHS Highland, n.d, i), reinforcing perceptions of waiting times—a known barrier to patient engagement in patient-initiated care pathways (Sherlaw-Johnson et al., 2024). Similar messaging is used in FV (NHS FV, n.d) and Lothian (NHS Lothian, n.d)

Of greater concern, the A&A website contradicts DPIR principles: "*If you have any worries or concerns regarding your recent surgery, you can contact your family doctor (GP) for advice*" (NHSA&A, n.d), directing patients to primary care rather than the secondary care arthroplasty team. GGC does not provide any details to contact the arthroplasty team (NHSGGC, n.d).

Only GJ clearly articulates open-ended access, while providing indicative timelines for call returns: "*You may contact The Arthroplasty Helpline at any point regarding your joint replacement—several years after your operation. If we have not returned your call within one working day, please contact us again*" (NHS GJ, n.d).

Self-Referral and Direct Patient Engagement versus GP Referral Pathways and Equity Considerations

Despite the availability of a direct access route to the arthroplasty team, patients reportedly default to primary care, particularly GPs, a concern generally noted in patient-initiated care models (NHS, 2022). Clinicians in the study were divided on the implications of this trend: some argued the initial contact route matters less, as patients eventually return to the team through referrals, while others highlighted that GP or district nurse consultations can lead to suboptimal outcomes, supported by evidence of opioid overprescribing in primary care for arthroplasty patients (Klueh et al., 2020; D'Amore et al., 2023). Daily helpline use is reportedly substantial (17 and 50 calls per day) in Highland and GJ, showing that patients do access care directly via helpline. It is therefore essential to review the proportion of patients still accessing care via indirect routes, identify the underlying factors—whether systemic barriers or individual care-seeking behaviours—and examine helpline utilization for DPIR patients by HBs. Avoidable routing through primary care and referral pathways creates waste at the service level (value-based

healthcare) and places additional strain on these services, reducing efficiency across the health system and compromising patient outcome (value-based health system (Smith et al, 2023)).

Inadequate patient messaging may reinforce systemic barriers for some patient groups, preventing them to directly engage with the arthroplasty team. Language and disability support reportedly exist but are not conveyed, at least via HB websites or online patient booklets, limiting perceptions of equitable access and reinforcing reliance on familiar routes, particularly GP care. This disproportionately affects socio-economically deprived patients, who face challenges securing timely GP consultations (University of Glasgow, 2023). While DPIR is recognized for improving efficiency by reducing unnecessary appointments for asymptomatic patients across IDI and survey respondents, equity considerations require further exploration—reflected by 50% of survey respondents who were neutral or disagreed that the process is equitable—particularly if local audits identify some patients resist engaging directly, limiting timely access. This reflects the "demand–supply interaction" in healthcare, where patient use is shaped not only by service availability, but by confidence to engage (Levesque et al., 2013). Effective, consistent information is crucial to strengthen patient activation—the willingness to use the service (helpline in the study's context)—particularly among older adults (Carman et al, 2013; Abid et al, 2020; WHO, 2021; Sharkiya, 2023). Aligning DPIR with Realistic Medicine principles—providing personalized, appropriate care—requires consistent, patient-centred communication. Without this, helpline access may remain underutilized among disadvantaged groups, reflecting structural barriers and horizontal inequities. In-depth local audits are needed to identify unwarranted variation and understand how these groups navigate the pathway, enabling targeted interventions to improve equitable engagement with the direct access line.

Helpline Operations and DPIR Patient Demand

Across HBs, arthroplasty helplines also receive queries from non-DPIR patients, underscoring the need for clear SOPs to define the helpline's purpose and specify the appropriate stage for sharing the number with patients. Currently, its inclusion in pre-op booklets leads patients to use the helpline for general rather than DPIR-specific concerns. This is particularly concerning in GJ and Highland where the voicemail volumes are comparatively higher, and reportedly place substantial operational pressure on APs.

Furthermore, the helpline demand should be assessed in terms of unique patient engagement rather than total call volume (Sherlaw-Johnson et al., 2024; Younis et al., 2024; Pope et al., 2024). A value-based approach requires local audits to review the nature of queries, identify inappropriately directed inquiries, and streamline interactions before introducing restrictive measures such as time-limiting DPIR contacts (as proposed in Highland) without assessing DPIR patient-specific demand on the helpline.

Understanding the reasons for calls could highlight information gaps and guide improvements in patient resources to reduce reassurance-seeking contacts, as suggested by some APs. However, others noted that many patients continue to call for reassurance even when adequate information is available. This underscores a core tension: while efficiency depends on reducing unnecessary contacts from staff's perspective, patients may view such reassurance as important to them. If the helpline functions as a trusted source of support, some contacts cannot simply be dismissed as

unnecessary or wasteful. The challenge is therefore to balance efficiency with patient confidence so that DPIR to deliver patient-centred care, while also supporting clinicians to manage demand effectively. Organizational review is needed to identify locally appropriate solutions to optimize the helpline as a patient pathway—for example, A&A's use of administrative staff to triage queries enables APs to focus on clinical concerns, optimising resources while sustaining patient support. Such measures, however, should be embedded within clear SOPs.

5.1.2. Managerial Engagement with Staff

Managerial support that encourages experimentation and collective interpretation of innovations—allowing staff to try new approaches and discuss their meaning and implications collaboratively—is a critical organizational enabler for adopting new practices (Weick, 1990; Greenhalgh et al., 2004). In most HBs, a devolved structure was noted enabling APs to leverage each other's skills to manage operational and clinical demands as a self-contained team and adapt to DPIR, viewing remote support as an extension of their clinical role. This empowered them to make autonomous decisions suited to optimize their team capacity, and address patient needs collaboratively, with support from other units when needed, reflecting strong organizational dynamism essential for supporting innovations at the organizational level (Shaker and George, 2002). Institutional and peer support in improving patient communication further reinforced engagement, enabling staff to innovate in day-to-day practice, a principle of practicing realistic medicine (Medicine, n.d).

In contrast, GJ experienced some challenges. APs reported limited managerial engagement during DPIR implementation regarding the impact on their role and wellbeing, particularly in managing the helpline, which constrained their active participation in organizational change. Unmet training needs further affected organizational responsiveness and staff motivation, (50% of GJ APs disagreed that job satisfaction improved). Allocating time for training in patient communication is a key enabler of organizational innovation and workforce redesign under patient-initiated care models (Sherlaw-Jonhnson et al, 2024; NHS Employers, 2024), and in GJ, staff emphasized the importance of addressing this need to enhance engagement and capacity.

This contrast illustrates that organizational-level factors—managerial climate, role autonomy, and training—directly shape innovation adoption. Boards with supportive climates and empowered staff demonstrated higher dynamic capacity, facilitating DPIR implementation. Meanwhile, boards with stressful climates and structural constraints faced significant barriers, limiting engagement and the potential for workforce-driven improvement.

5.1.3. Strengthening Clinicians Engagement for Effective DPIR Service Delivery

Factors influencing consultants' and APs' engagement with the DPIR model varied across boards.

Concerns among APs were particularly notable in GJ and Highland, primarily linked to higher call volumes. This challenge could be mitigated through HB-level QA mechanisms to improve process efficiency. Role ambiguity was reported in GJ, limiting APs' sense of contribution to patient healthcare goals. Research indicates that this can lead to emotional exhaustion and lower job satisfaction (Mwakyusa and Mcharo, 2023; Sherlaw-Johnson et al, 2024) – evident in the study where 50% of GJ APs reported lower job satisfaction. These findings underscore the importance of supportive systems to establish role clarity and meaning, enabling adoption of new models. Also, it is worth noting

that GJ APs expressed mixed perspectives on all key survey metrics—including efficiency, timely access, and job satisfaction—hinting at uncertainty in team functioning. Such uncertainty can contribute to operational inefficiencies, which may be misattributed to inadequate resource capacity. Engagement with other HBs where teams are seen working collaboratively to confidently deliver services under DPIR, could help build GJ APs' trust in DPIR value proposition, improve team dynamics, and foster adoption.

Reduced engagement among consultants was linked to lower job satisfaction, with 50% disagreeing or remaining neutral regarding satisfaction as impacted by DPIR. Consultants primarily observed post-operative issues rather than positive surgical outcomes, limiting their opportunities to exercise clinical judgment. This highlights the need for a cultural shift from paternalistic models toward shared decision-making approaches that empower patients: a well-documented barrier to professional practice modernization in arthroplasty care (Edusei et al, 2017; Sherlaw-Johnson et al, 2024).

APs are widely recognized for their role in arthroplasty patient management, with consultants acknowledging their contributions across the wider system (Walton et al., 2008; Fan et al., 2014; Daw & Armstrong, 2023). are widely recognized for their role in arthroplasty patient management, with consultants acknowledging their contributions across the wider system (Walton et al., 2008; Fan et al., 2014; Daw & Armstrong, 2023). However, the study noted that for some consultants—particularly those newly onboarded—adoption of DPIR appeared to be influenced more by surgical volume than by confidence in APs. Most HBs reported strong collaboration, with APs feeling supported by consultants, highlighting the importance of team integration, psychological safety, and shared decision-making (Stein, 2024) in fostering engagement with DPIR. In Highland, however, APs noted that their professional judgment was occasionally questioned, suggesting challenges in consistent adoption despite system-wide recognition of their role. This, in turn, influenced some consultants' early engagement with the AP-led DPIR model. While structural support and collaborative practices are essential for successful innovation (Stein, 2024a), variations in individual consultant confidence can affect the overall adoption and effectiveness of DPIR implementation.

5.2. Addressing Wider Systemic Factors for Effective Service Delivery under DPIR

5.2.1. Digital Re-Infrastructuring and QA

Digital System Fragmentation and Implications for DPIR Assessment

Typically, eHealth initiatives require digital system re-infrastructuring to create new information flows without disrupting existing processes (Grisot & Vassilakopoulou, 2017). However, the current TRAK system remains optimized for F2F appointments and is widely regarded as inadequate for capturing the range of remote patient interactions. Consequently, HBs have relied on workarounds—such as manual recording or local databases (e.g., Exclicare in GJ, Orthowave in Highland)—which are not interoperable with standard TRAK. The adaptation of APs to record virtual consultations within TRAK is further complicated by variations in system versions across HBs, while the absence of local SOPs increases the risk of inconsistent documentation even within the same board, as emphasized during CfSD meeting.

Resultantly, recording of remote patient interactions—helpline support and virtual consultations—remains fragmented, inconsistent, and siloed, limiting accurate assessment of DPIR performance at regional and national levels. The variety of systems in use reflects the lack of national-level recognition that patient interactions are increasingly remote and varied rather than limited to F2F clinic appointments, and require adequate infrastructure to enable its reporting. Challenges in recording virtual consultations have been longstanding, as noted in the 2019–2020 NearMe Video Consulting Service Evaluation (Scottish Government, 2020), mirroring concerns reported by study participant.

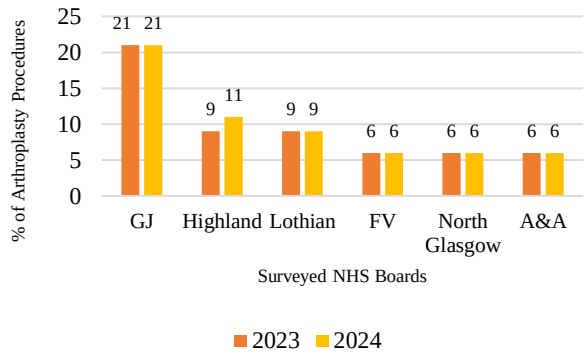
Need for National-Level Action and Re-Infrastructuring

For systemic quality assurance of remote patient interactions, strong leadership and coordinated national action are essential. This requires investment in re-infrastructuring TRAK to centralize its use and ensure consistent capture of the full continuum of patient interactions, including the minimum data points identified by CfSD (see Exhibit 4.10). At present, national oversight relies heavily on HB-level reporting. While CfSD provides advisory support, no formal reporting or monitoring processes exist to track DPIR compliance, performance, or effectiveness, and timely access to service data is not guaranteed. The absence of standardized recording and robust oversight mechanisms therefore highlights the need for coordinated action at both national and regional levels to secure accurate, reliable documentation of all DPIR interactions.

5.2.2. Rising Joint Volumes and Capacity Constraints

Within the context of wider systemic factors affecting DPIR service delivery, the rise in JR volumes (Scottish Government, 2024; Scottish Government, 2025)—most notably in Highland (see Exhibit 5.3)—highlights the need to assess whether other HBs will experience similar increases and at what scale. This requires proactive workforce planning and resource forecasting across boards, in perspective of work requirements under DPIR. However, fragmented digital data systems render much of the clinician workload effectively invisible, as remote consultations and helpline interactions are inconsistently recorded, limiting accurate demand assessment and masking the redistribution of workload under DPIR. This gives rise to a productivity paradox (Stein, 2024a; Stein 2024b): while innovative service models improve patient care, they create uncertainty around productivity because traditional performance metrics fail to capture new forms of activity. Without integrated digital infrastructure, standardised recording protocols, and revised performance measures aligned with DPIR pathways, HBs are unable to reliably forecast needs, benchmark

Exhibit 5.3 – Proportion of Total Arthroplasty Procedures Performed by Surveyed NHS Boards as a Proportion of National Activity



Reference: PHS (2025a)

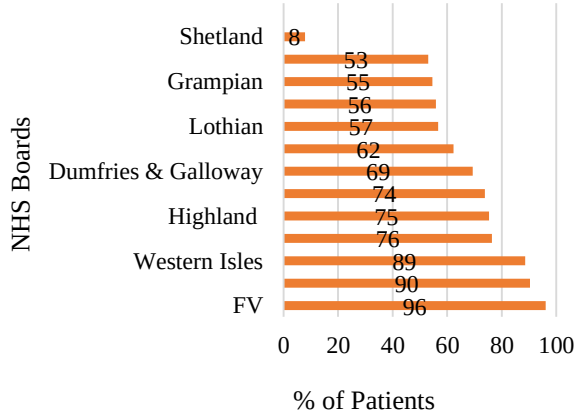
performance, or demonstrate efficiency gains. Local audits are therefore essential to assess the impact of nationally driven increases in JR volumes on AP capacity constraints. Also, coherent policy alignment and improved data interoperability at the national level are critical to ensuring equity across boards and enabling DPIR to deliver sustainable and effective services.

5.2.3. Care Coordination

Exhibit 5.4 indicates that not all arthroplasty patients are treated within the NHS board where they reside, as NTCs and GJ facilities are designed to manage waiting times and distribute patient flow (NHS Inform, n.d.). In boards such as Grampian and Lanarkshire, fewer than 60% of patients receive surgery locally (PHS, 2025c). Clinicians reported that patients often prefer care closer to home, a viewpoint supported in the literature (Busch, Saxena, and Wu, 2021; Oliver, 2025), but existing service-level agreements, identified during IDIs and stakeholder meetings, require them to contact the unit where their surgery was performed, if facing any concerns. This limits responsiveness to patient choice (Mirzoev, 2017) and contributes to

patients using their GP as the first point of contact. Exploring pathways to transition follow-up care to local units, while maintaining accountability under service agreements, could improve responsiveness by better aligning service availability with patient choice. Value-based health care needs to be delivered over the life course (Smith et al, 2023), not just at the point of care. Although remote pathways can enhance timeliness and reduce travel, when F2F appointments are clinically necessary post-arthroplasty, service arrangements can create tensions. For instance, APs reported that some consultants are reluctant to review patients from other units, leading staff to perceive a need to minimise in-person visits even when clinically required—an unintended consequence of service arrangements requiring review to facilitate DPIR delivery.

Exhibit 5.4 - Percentage of Arthroplasty Patients that Reside within an NHS Board and Have Been Treated by That NHS Board



Reference: PHS (2025c)

5.3. Variation in Follow-Up and Monitoring Practices

The UK SAFE study (Kingsbury et al, 2022) supports disinvestment in routine follow-up up to 10 years postoperatively, while recommending radiographic review at 10 years to guide any further follow-up. In contrast, neither SCOT guidance nor the 2023 BOA guidelines requires patient return when a self-referral pathway is in place, although other studies similarly recommend post-10-year follow-up (Smith et al., 2019). Given confidence in surgical techniques and implant durability (Bergstein et al., 2024), which aligns with clinicians' perspectives, the post-10-year follow-up warrants further consideration at the national level.

Long-term PROMs are collected only in GJ. While BOA guidelines (GIRFT and BOA, 2023) recommend PROMs collection, SCOT does not, reflecting a lack of consensus on standardized outcome monitoring. The role of PROMs as a reliable safety-netting tool remains under evaluation, given concerns about their responsiveness for timely identification of postoperative complications or deterioration, as well as associated costs and resource implications (Canfield et al., 2019; Fisher et al., 2019; Piuzzi et al., 2021; Spece et al., 2025). A clear national strategy is therefore required to clarify the need of PROMs.

Similarly, literature shows that virtual clinics (Preston et al, 2019, 2023) are implemented primarily when patient self-referral is unavailable. However, given the DPIR pathway, local audits should assess their effectiveness in contexts such as A&A, with guidance and support from national-level oversight. Both PROMs and virtual clinics should be evaluated through the lens of eliminating inefficiencies and optimising resource use while maintaining patient-centred, safe, and effective post-arthroplasty care.

6.0. Recommendations

This study highlighted both the strengths of the DPIR model and the challenges limiting its full potential. To address these barriers and secure its long-term sustainability, a phased set of key recommendations is proposed for action at national and HB levels, focusing on governance, workforce, and system-level reforms to enable consistent, high-quality, and patient-centred delivery across NHS Scotland.

1. Strengthen Governance and Quality Assurance (Immediate Priority)

a) **SOPs Guiding the Service Delivery under DPIR:** All orthopaedic units must ensure to have SOPs to guide the service delivery under DPIR for their respective units, which are reinforced to ensure accountability of the processes critical for patient safety. **Engage with SMs** to identify and address challenges in reinforcing SOPs. The lack of adherence to SOPs hinders effective auditing and QA. SOPs should clearly define helpline management protocols, and documentation standards. The localised SOPs should also establish monitoring and coordination mechanisms for out-of-hours (OOH) contacts through the wards, specifically in the case of Highland and GJ.

b) **Review of Patient Communication Material:** All units must review existing patient-facing materials (including websites and booklets) to ensure clear, consistent, and accessible information about the DPIR pathway, including support for patients with specific communication needs. Where necessary, additional measures should be implemented to communicate the DPIR pathway equitably to all patients.

c) **Conduct Local Audits:** All units must conduct regular audits of the DPIR process. Audits should capture minimum dataset requirements, patient re-engagement routes (direct vs. GP referral), helpline usage patterns, and equity of access to identify and address unwarranted variations in care. Selected data points are proposed in Annexure 9.1 for consideration. Audits should also assess the effectiveness of locally adapted practices, such as virtual clinics, with a focus on patient outcomes and service efficiency.

Regarding recommendation 1a, central support can be provided to HBs from CfSD to align localised SOPs with the broader DPIR design specifications outlined by SCOT (and CfSD) in accordance with local needs and resources. Any local adaptations should remain consistent with the overarching purpose and principles of DPIR. For recommendation 1d, the proposed frequency of local audits is not specified in SCOT, CfSD, or BOA guidance. CfSD can establish a centralized framework to standardize audit frequency, reporting formats, and minimum data set requirements, enabling longitudinal analysis and service improvement at the HB level. Data sharing agreements with CfSD would support national improvement efforts and facilitate cross-HB learning and consistency.

2. Optimise Helpline Management and Workforce Capacity (Short-to-Medium Term Priority)

a) **Ascertain helpline purpose and implement triage:** All units must clarify the helpline's role in managing patient inquiries across the arthroplasty pathway, including pre-op queries, and introduce locally tailored triage mechanisms to redirect non-DPIR issues to the appropriate teams, reducing unnecessary AP workload and ensuring timely responses.

b) **Optimising AP Staffing, Workload, and Role Recognition:** The units must also review AP staffing levels as affected by rising surgical volumes, such as Highland, where volumes increased from 9% to 11% (see Exhibit 5.3), with recruitment planned. Workforce forecasting should be coordinated with national stakeholders to anticipate staffing needs. When increasing AP numbers, SMs should assess team inefficiencies, as highlighted in GJ, and integrate APs into service transformation initiatives through structured onboarding. Engagement with APs should reinforce their clinical value, provide targeted training (e.g., virtual consultations, managing difficult conversations), and address operational inefficiencies to support staff well-being, job satisfaction, and effective workload management.

c) **Foster a Supportive Team Culture (ongoing):** SMs should promote a collaborative and supportive environment where staff feel empowered and engaged in the service redesign. This includes fostering trust between consultants and APs, ensuring psychological safety for open communication and collaboration, and creating opportunities for peer mentorship and shared learning, which have proven successful in several HBs.

For recommendation 2a, helpline roles and management should be included in localized SOPs. To reduce helpline traffic, Jensen et al. (2024) reported that a digital communication portal post-orthopaedic surgery reduced patient-initiated calls and improved satisfaction, though it required administrative support. Such platforms could be trialled

but cannot replace telephonic access, as one-third of patients—particularly older adults—do not access NHS services digitally (Good Things Foundation, 2025; Age UK, 2025), risking exclusion. Adoption should therefore consider resource needs, cost-effectiveness, and equity. For 2b, health economic analysis could optimize AP staffing, dependent on adequate digital systems providing accurate visibility to patient demand and staff workload. While digital improvements are proposed as a medium-to-long-term priority (see below) due to the need of collaboration and strategic collaboration, current data should guide immediate staff planning to support the Scottish Government's joint volume increase target.

3. Improve digital infrastructure and system-level coordination (Medium-to-Long-Term Priority)

a) **Invest in Patient Management Information System to Support DPIR:** A national level action is needed to reconfigure the TRAK system to adequately capture asynchronous helpline calls and virtual consultations, ensuring visibility of all patient interactions. This will enhance insights into patient engagement, AP workflows, reduce inefficiencies, and support local audits. Integration between secondary and primary care systems is essential, as GP letters are currently recorded separately. NHS Lothian's forthcoming system (https://www.med.scot.nhs.uk/digital/trak) demonstrates the potential for seamless data sharing. Standardizing these approaches across all Health Boards, with national support, will prevent data fragmentation and ensure interoperability, enabling smooth information flow between primary and secondary care.

b) **HBs should review service-level agreements** with NTCs, GJ, and other orthopaedic units that require patients to return to their original surgical site for follow-up, especially when they live in a different HB. This can be burdensome for patients undergoing multiple arthroplasties at different units. Where feasible, pathways should enable follow-up at local units, improving patient-centred care, ensuring continuity, and aligning services with patients' preference for accessing care closer to home.

c) **Strengthen Primary and Secondary Care Coordination:** HBs should implement targeted strategies to strengthen collaboration between arthroplasty teams and primary care providers (particularly GPs), ensuring timely referrals for patients on the DPIR pathway for joint-related issues. Supported by integrated digital systems, this collaboration can enhance care coordination, streamline information flow, and ensure referrals are efficiently managed across primary and secondary care, including cases where patients are to be referred to the arthroplasty team from another HB unit or to NTC instead of their local unit

d) **Assess Patient Experience and Care Pathways:** Develop and administer a dedicated survey to evaluate patient satisfaction, understanding of the DPIR pathway, and perceived or experienced barriers to accessing care via the DPIR helpline, including remote consultations. In parallel, map the pathways through which patients present with problems to access care, to understand the burden on different parts of the system. Insights from these activities should be used to streamline processes, enhance patient experience, and ensure equitable access to services.

Regarding recommendation 3a, national-level leadership is needed to drive investment and collaboration for improving digital infrastructure and its standardized implementation across HBs. Where digital systems already exist, integration and interoperability should still be ensured. For 3b, onboarding consultants is essential to establish pathways for patients treated outside their territorial units who require follow-up care, as some may be reluctant to take over patients from others. Finally, a patient survey questionnaire has been drafted (see Annexure 9.7) to administer the survey proposed in 3d for consideration.

7.0. Conclusion

This study evaluated the effectiveness of the DPIR model for primary hip and knee arthroplasty review services in selected NHS Scotland HBs. Using the NASSS framework, it explored clinicians' perspectives on DPIR's impact on timeliness, patient-centredness, and efficiency of review services, and factors affecting its adoption and sustainability. Overall, clinicians perceived DPIR as effective in enhancing patient care, providing helpline access for timely triage, reduces unnecessary appointments, and improves efficiency and value for both patients and the health system.

However, **key areas for improving service delivery under DPIR** relate to:

- QA mechanisms: Limited visibility and adherence to SOPs led to inconsistent patient communication, creating barriers to equitable patient engagement and weakening local auditing processes. In addition, non-DPIR queries were reported to be directed to the arthroplasty review helpline, further increasing workload pressures and contributing to operational inefficiencies
- Data capture and resource planning: Currently, the patient management system (TRAK) does not capture remote interactions, particularly helpline calls, leaving a substantial proportion of APs' workload and patient interactions unrecorded. Consequently, accurately assessing DPIR patient demand is challenging, especially in higher-volume HBs (GJ and Highland), where rising surgical volumes are increasing operational pressures and limiting effective resource planning.
- Improving patients' direct engagement**:** Despite direct access to arthroplasty teams, some patients continue to access primary care providers as their first point of contact. This highlights the need for a dedicated patient survey to identify barriers to helpline use and stronger coordination with GPs to ensure timely referrals and prevent sub-optimal outcomes.
- Clinician engagement with DPIR varied across HBs. Strong collaboration between consultants and APs, and within AP teams, was recognised as critical to effective service delivery. However, in higher-volume HBs, some APs experienced role ambiguity and reduced job satisfaction due to increasing helpline workloads and limited training in remote care. Further, consultants' confidence in the service delivery was constrained by lack of robust local audit data.

Key recommendations proposed under this study for enhancing service delivery under DPIR include:

- Strengthening local governance and audit processes;
- Investment in electronic patient management system to adequately capture all patient interactions;
- Optimising helpline management and workforce planning to respond to increasing surgical volumes;
- Enhancing AP engagement to support clarity in clinical roles and strengthening team building;
- Enhancing primary–secondary care coordination to ensure timely referrals from local GPs to arthroplasty teams.

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9.0. Annexures

9.1. Secondary Data Points for Analysis/Audit

The following data points can be considered for local audit purposes.

The number of hip and knee replacements performed between 2021-2024 (exclude revisions)
The number of these cases which have subsequently undergone revision
The patient reported outcome measures (PROMs) data for these patients (scores and satisfaction) up to 3yrs where possible (local process specific to GJ)
Number of patients who had follow-up prompted by PROMS – and outcomes from that including revision
The number of patients who were put on DPIR after post-op review
The number of helpline calls / the number of patients who contacted the DPIR helpline service, along with the breakdown of categories for why, including -The number of patients who received appointments -The number of patients who attended the appointments (by appointment type – F2F, video or phone)
The number of helpline calls that resulted in a F2F appointment
The number of patients who have been discussed at the x-ray meeting and how many x-rays were flagged which changed the follow-up (Local process specific to GJ)
Time patients waited for their follow-up appointments through DPIR helpline, categorized by appointment type
Time allocated for a new outpatient appointment vs for follow-up appointment
The number of staff in each discipline in the orthopaedic unit between 2018 – 2024 directly involved in the DPIR pathway, including their roles and responsibilities.
CHI numbers for the patients who have been identified as having issues via PROMS questionnaires. This will allow for this small subset of patients to be reviewed to identify any themes around the dissatisfied outcome. CHI numbers for the patients initiating the contact through helpline and their analysis via Scottish Multiple Deprivation Index (SIMD)

9.2. Rationale for WHO Health Service Improvement Framework

The WHO (2018) approach to quality of care, supported by 2021framework on patient safety offers a more comprehensive perspective compared to earlier formulations. Donabedian (1980) provided a conceptual foundation by emphasizing patient welfare, while the Institute of Medicine (1990) and the Council of Europe (1997) focused on professional knowledge and treatment effectiveness at the individual level. Both did not explicitly mentions integrated health systems as a principle for achieving health service improvement. In contrast, the WHO definition integrates culture and individual behaviours affecting health services and extends them by explicitly addressing how it impacts both individual and population outcomes at the systems' level. This framing makes it particularly relevant for integrated health systems operating across diverse contexts necessitating engagement from various stakeholders, to balance patient-centredness and system efficiency with public health priorities.

9.3. Semi-structured survey questionnaire

Participant Information

You are invited to participate in a study survey conducted in collaboration between the NHS Golden Jubilee, Centre for Sustainable Delivery, and Department of Management Science at Strathclyde University. The purpose of this survey is to understand staff experiences and perceptions regarding the discharge patient-initiated review (DPIR) process at NHS Golden Jubilee for patients undergoing total hip and knee replacements. This study is being conducted by an MSc Health Analysis, Policy and Management student at Strathclyde University, as part of her final year project. The work is supervised by Dr Robert Van Der Meer, a member of staff at the Dept of Management Science and has been approved by the Departmental Ethics Committee. Your responses will be used to prepare the DPIR service evaluation report and producing a research thesis output at the MSc level.

Your insights are important in helping us evaluate how well the DPIR model is working and in identifying opportunities for improvement. The questions will cover your role in the DPIR process, confidence in the DPIR, communication effectiveness, and DPIR's overall impact on patient care and staff experience.

The survey will take 15 minutes. Your participation in this survey is voluntary, and all responses will be kept confidential and anonymous. You are free to skip any question or withdraw from the survey at any point without giving any reason. In this case any data you have given will be withdrawn from the study and destroyed. The completed questionnaires, which are anonymous, will be held securely in store at the University of Strathclyde and Centre for Sustainable Delivery for up to 12 months, or until the completion of the study report and thesis output. After this period, all data will be securely destroyed.

If you have any questions about the study, please feel free to contact us: Dr Robert Van Der Meer, Email: robert.van-der-meer@strath.ac.uk

Consent

I agree to take part in this survey.	I. Yes	II. No
I agree to the information I provide being used as part of the study as specified	I. Yes	II. No

Questionnaire starts:

1.	Position in NHS GJ	I. Consultant	II. Resident doctor (NTN or fellow)	III. Arthroplasty practitioner		
		IV. Physician associate	Others			
2.	How long have you been working in this position at NHS GJ?	I. Less than 06 months	II. 6 – 12 months	III. Over 1 year		
3.	What do you understand by the term Discharge Patient initiated review (DPIR)?					
4.	Please briefly describe your responsibilities within the DPIR process for patients who have had total hip or knee replacements.					

For the following statements, please indicate the extent to which you agree or disagree using the scale below

5.	I am confident that the patients selected for the DPIR pathway possess adequate *knowledge* to self-manage and identify complications.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
6.	I am confident that the patients selected for the DPIR pathway *can* self-manage and identify complications.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree

7.	I am confident that the DPIR patients know *how* to contact the arthroplasty service for support if they experience any symptoms or complications related to their surgery.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
8.	The combination of *verbal discussion and written information leaflets* are adequate for ensuring patient understanding and retention of key information about self-management and how to contact the arthroplasty service.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
9.	Could you share any comments or explanations regarding your responses to questions 5 till 8?					
10.	The DPIR process allows us to identify and address complications early.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
11.	There is consistent and effective communication between the surgical and follow-up teams.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
12.	I am confident that patients can book a timely appointment when required.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
13.	Could you share any comments or explanations regarding your responses to questions 10 till 12?					
14.	A guidance document or standard operating procedure outlining my responsibilities, as well as those of the coordinating team, has been shared.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
15.	I am provided with adequate support to perform my role in the DPIR process.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
16.	Senior management are fully supportive of our DPIR pathway.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
17.	Could you share any comments or explanations regarding your responses to questions 14 till 16?					
18.	In your experience, has the DPIR process made a noticeable *positive* difference to any of the following?					
18.1.	The quality of my interaction with patients - moving from a traditional model to a realistic medicine interaction, i.e. treating patients as individuals.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree

18.2.	The patient's experience overall.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
18.3.	My workload.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
18.4.	My job satisfaction.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
18.5	Could you share any comments or explanations regarding your responses to questions 18.1 till 18.4?					
19.	**In your experience, is the DPIR process:**					
19.1.	Safe?	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
19.2.	Effective?	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
19.3.	Efficient?	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
19.4.	Patient-centred?	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
19.5.	Timely?	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
19.6.	Equitable?	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree
19.7.	Could you share any comments or explanations regarding your responses to questions 19.1 till 19.6?					
20.	We would really value any additional comments you may have about your experience with the DPIR process for hip/knee arthroplasty patients.					

9.4. IDI Guide for APs

Respondent category	Arthroplasty practitioners
Name of the interviewee (and position)	
Date and time of the interview	
How long have you worked in this post?	
Interview starts	
Work role	
1.	Please tell me about your current role in the service and your involvement with the DPIR process for joint arthroplasty patients?
The DPIR process	
2.	Could you please describe the DPIR pathway in detail for patients after routine hip/knee replacements? and how this approach differs from the previous model of managing their follow-up?
	I. How do you decide which patients are suitable for the DPIR pathway? What criteria do you look for?
	II. What safeguards are in place to ensure patient safety in the absence of routine in-person reviews?
	III. Can you walk me through the patient and carer induction process? How do you inform them about which symptoms to look out for and when to contact you, and what's your specific role in this? • How do you assess a patient or carer's understanding of the DPIR pathway*?* • In your experience do patients generally understand how to initiate a follow-up appointment under the DPIR pathway? • Do you have standardised patient information materials to help patients understand the DPIR process? • Are the current information and communication channels sufficient?
	IV. How are patients' clinical outcomes tracked, monitored and audited when they are placed on the DPIR pathway? and what role do you play in this? • Do you know who is responsible for managing the PROMs process (sending reminders, tracking responses, data management? • If a patient's PROMs report problems, what processes do you have for review and follow-up? • At what time points are PROMs sent to patients, and how are these intervals determined? • How are the collected PROMs data integrated into the patient's electronic health record or clinical workflow? • Have there been any challenges ensuring timely or complete submission of PROMs from patients? • Any actions taken to mitigate the challenges identified? • How are collected PROMs used in clinical decision-making, and do you see that reflected in the workflow? How do you access and review patient PROMS data? • Do you think the current PROMs process is effective? Why or why not? • Would you recommend any changes to how PROMs are communicated or followed up with patients?
	V. What is the process for assessing whether a patient who makes contact through the triage/helpline number requires an appointment (f2f, video or by phone)? And what role do you play in this? VI. How are appointment requests initiated by returning patients prioritised? And how are they balanced against other scheduled appointments? VII. What escalation mechanisms are available if a patient reports an urgent problem?
Implementing the DPIR process	
3.	How would you describe your overall experience with the transition to the DPIR process for patients after joint replacement? I. What aspects of the DPIR process have worked particularly well from your perspective? II. What challenges have you encountered during the implementation of the DPIR process and how were they managed or resolved? III. Were there any unforeseen difficulties in day-to-day practice?
4.	From your perspective, has the quality of patient care been maintained, improved or compromised under the DPIR process? I. Are there specific groups of patients for whom this process is (more or less) appropriate?
5.	In your experience, how effective is the DPIR process in identifying post-operative complications (e.g., infection)? I. Have there been any instances where delayed identification of complications had clinical consequences?

	II. How does this compare to the traditional in-person or scheduled follow-up process? III. Are there any specific types of complications that are more likely to be missed or delayed under the DPIR process? IV. Have you seen any differences in patient outcomes between those followed under the DPIR process and those in routine follow-up process?
6.	What are your views **on time-limited vs open-ended follow up** DPIR?
7.	Have you noticed any changes in how the DPIR process influences other healthcare services, such as primary care?
8.	How has the DPIR process affected the number of appointments, missed appointments (DNAs), face-to-face consultations, and the balance between service capacity and patient demand?
9.	Are there any unintended consequences when using the DPIR process which we have not discussed so far?
10.	Do you have any reflections about the data that is or is not being collected to measure the impact of the DPIR process?
Staff experience and engagement with the DPIR process	
11.	Were you and your team provided with adequate training and support to implement the DPIR process? I. What types of training (if any) were most helpful? II. Did you feel prepared to transition to this model of care?
12.	Do you feel that your responsibilities in this pathway are clearly defined and manageable?
13.	What challenges were there (if any) in integrating the DPIR process with your existing workflow or practice?
14.	Has the introduction of the DPIR process affected your workload? If so, how it has affected your/clinical staff's time and availability? How does managing patients under the DPIR model compare to traditional follow-up model in terms of **time and capacity** to deliver care?
15.	Has DPIR had any impact on your job satisfaction?
16.	How has the implementation of the DPIR process affected the wider team, including clinical and administrative staff? Did the shift to DPIR create any bottlenecks or gaps in communication between clinical team and administrative staff?
17.	Have you noticed any changes over time in how staff view or engage with the DPIR pathway?
18.	Do you feel supported by colleagues and leadership in delivering this model?
19.	Are there any mechanisms in place for feedback from you and other stakeholders? Have you had the opportunity to provide feedback on the DPIR process?
Patient experience and engagement with the DPIR process	
20.	From your interactions, do you believe patients are satisfied with the DPIR process? If yes, how? If not, what are their reasons?
21.	In your experience, has the DPIR process helped patients feel more informed or engaged in their care?
22.	Have you received any direct feedback from patients regarding the DPIR process? I. Are there any aspects of the DPIR process that patients have found confusing or problematic? II. Do you think removing scheduled follow-up increases anxiety for certain patient groups?
23.	Are you aware of any variation in experience / outcomes for different patient populations with the DPIR pathway? I. Age, gender, geography, socio-economic status, other vulnerabilities? II. What impact has this had? III. Any adaptations to address these?
24.	How confident are you in patients' ability to self-identify symptoms or complications and seek help appropriately with the DPIR process?
25.	Do you foresee any challenges in maintaining patient engagement or trust with fewer face-to-face attendances?
26.	What action have you taken to address potential barriers to accessing the service for different groups/ individuals? How do you mitigate the risks in patients who do not proactively report problems?
Suggestions/recommendations	
27.	What changes would improve the DPIR process?
28.	What improvements (if any) would you suggest to enhance monitoring of patient outcomes?
29.	What changes would you suggest improving patient engagement and satisfaction? Are there any aspects of the patient journey that could be better integrated or streamlined?
30.	Is there anything additional you would like to mention that we have not covered yet?

9.5. IDI Guide for Consultants

Respondent category	Consultants
Name of the interviewee (and position)	
Date and time of the interview	
How long have you worked in this post?	
Interview description	
Interview starts	
Work role	
1.	Please tell me about your current role in the service and your involvement with the DPIR process for joint arthroplasty patients?
2.	Were you involved in the set up or design of the DPIR system?
The DPIR process	
3.	Could you describe the DPIR pathway for patients after routine hip and knee replacement? and how this approach differs from the previous model of managing their follow-up?
	I. How is it decided which patients are suitable for the DPIR pathway i.e. on what criteria? II. What safeguards are in place to ensure patient safety in the absence of routine in-person reviews?
	III. What does the patient (and carer) induction process involve, and how are patients informed about what symptoms to look out for and when to seek help? IV. What do you think - are the current information and communication channels sufficient?
	V. How are patients' clinical outcomes monitored and tracked/audited after they have been placed on the DPIR pathway? (PROMs / comments box?) Are you involved in this process? VI. Do you access and review PROMs patient data?
	VII. What is the process for assessing whether a patient who makes contact through the triage/helpline number requires an appointment (f2f, video or by phone)? VIII. How are appointment requests initiated by DPIR patients prioritised? And how are these balanced against other scheduled appointments? IX. What escalation mechanisms are available if a patient reports an urgent problem?
Implementing the DPIR process	
4.	How would you describe your overall experience with the transition to the DPIR process for patients after joint replacement? I. What aspects of the DPIR model have worked particularly well from your perspective? II. What challenges have you encountered during the implementation/ delivery of the DPIR pathway and how were they managed or resolved? III. Were there any unforeseen difficulties in day-to-day practice
5.	From your perspective, has the quality of patient care been maintained, improved or compromised under the DPIR process? I. Are there specific groups of patients for whom this model is (more or less) appropriate?
6.	In your experience, how effective is the DPIR process in identifying post-operative complications (e.g., infection)? I. Have there been any instances where delayed identification of complications had clinical consequences? II. How does this compare to traditional in-person or scheduled follow-up process? III. Are there any specific types of complications that are more likely to be missed or delayed under the DPIR process? IV. Have you seen any differences in patient outcomes between those followed under the DPIR process and those in routine follow-up process?
7.	What are your views on time-limited vs open-ended follow up DPIR?
8.	Have you noticed any changes in how DPIR influences other healthcare services, such as primary care?
9.	How has DPIR affected the number of appointments, missed appointments (DNAs), face-to-face consultations, and the balance between service capacity and patient demand?
10.	Are there any unintended consequences when using the DPIR process which we have not discussed so far?
11.	Do you have any reflections about data that is or is not being collected to measure the impact of DPIR?

Staff experience and engagement with DPIR	
12.	What challenges were there (if any) in integrating DPIR with existing workflow or practice within the team?
13.	Has the introduction of DPIR affected your workload? If so, how? How does managing patients under the DPIR model compare to traditional follow-up model in terms of time and capacity to deliver care?
14.	Has DPIR had any impact on your job satisfaction?
15.	How has the implementation of DPIR affected the wider team, including clinical and administrative staff? Did the shift to DPIR create any gaps in communication between clinical team and administrative staff?
16.	Have you noticed any changes over time in how staff view or engage with the DPIR pathway?
17.	Do you feel supported by colleagues in delivering this model?
18.	Are there any mechanisms in place for feedback from you and other stakeholders? Have you provided any feedback on the DPIR process?
Patient experience and engagement with DPIR	
19.	From your interactions, do you believe patients are satisfied with the DPIR process? If yes, how? If not, what are their reasons?
20.	In your experience, has the DPIR process helped patients feel more informed or engaged in their care?
21.	Have you received any direct feedback from patients regarding the DPIR process? I. Are there any aspects of the DPIR process that patients have found confusing or problematic? II. Do you think removing scheduled follow-up increases anxiety for certain patient groups?
22.	Are you aware of any variation in experience / outcomes for different patient populations with the DPIR pathway? I. Age, gender, geography, socio-economic status, other vulnerabilities? II. What impact has this had? III. Any adaptations to address these?
23.	How confident are you in patients' ability to self-identify symptoms or complications and seek help appropriately with the DPIR process?
24.	Do you foresee any challenges in maintaining patient engagement or trust with fewer face-to-face attendances?
25.	What action have you taken to address potential barriers to accessing the service for different groups/ individuals? How do you mitigate the risks in patients who do not proactively report problems?
Suggestions/recommendations	
26.	What changes would improve the DPIR process?
27.	What improvements (if any) would you suggest to enhance monitoring of patient outcomes?
28.	What changes would you suggest to improve patient engagement and satisfaction? Are there any aspects of the patient journey that could be better integrated or streamlined?
29.	Is there anything additional you would like to mention that we have not covered yet?

9.6. IDI and Stakeholder Meeting Participant List

The following table provides a list of participants engaged through in-depth interviews (IDIs) and stakeholder meetings, along with the respective dates of engagement. Acronyms are used for IDI participants to ensure confidentiality.

IDIs with APs (online)	
NHS Highland (19/08/25)	KD
NHS Lothian (03/08/25)	MF
NHS GGC – NG (24/08/25)	PM
NHS FV (16/08/25)	TT
NHS A&A (02/08/25)	CI
NHS A&A (02/0825)	TM
IDIs with Consultants	
NHS GGC – NG (21/07/25)	MB
NHS GGC – NG (22/07/25)	DS
Stakeholder meetings (online)	
CfSD (25/07/25)	Lech Rymaszewski (Clinical Advisor) and Margaret Wood (NIA)
GJ (04/08/25)	Chris Gee, Associate Medical Director for National Elective Services, GJ and Focal Person for the Study at GJ

9.7. Patient Survey Questionnaire Draft

Consent									
A.	I agree to participate in this survey.	**i.**	Yes	**ii.**	No				
B.	I agree with the information I provide being part of the study.	**i.**	Yes	**ii.**	No				
Questions									
1.	What best describes your gender?	**i.**	Male	**ii.**	Female	**iii**	Prefer to self-describe: _____	**iv**	Prefer not to say
2.	How old are you?	———							
3.	Do you live alone?	**i.**	Yes	**ii.**	No	Comments:			
4.	Do you require support at home (relative, carer)?	**iii.**	Yes	**iv.**	No	Comments:			
5.	Do you have easy access to a phone?	**i.**	Yes	**ii.**	No	Comments:			
For the following statements, please indicate the extent to which you agree or disagree using the scale below									
6.	The clinical information I was given on discharge was clear and easy to understand.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree	Comments:		
7.	I am confident in my ability to recognize symptoms that require me to contact the arthroplasty service.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree	Comments:		
8.	Clear written instructions on *how* to contact the helpline were provided if I experienced any problems related to my joint replacement.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree	Comments:		

9.	I am confident that I *can* access the service at any time if I experience any problems related to my joint replacement.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree	Comments	
10.	Have you contacted the helpline number since your joint replacement?	i.	Yes (proceed to Q11)		ii.	No (proceed to Q16)		
11.	I found it easy to contact the joint replacement service through the helpline number provided.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree	Comments:	
12.	I was satisfied with the telephone support provided, including the initial discussion with one of the clinical team members.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree	Comments:	
13.	I was offered a clinical appointment soon after I reached out.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree	Not applicable	Comments – how long did you have to wait for your appointment?
14.	Who was your consultation with?	I.	Consultant					
		II.	Junior doctor					
		III.	Arthroplasty practitioner nurse					
		IV.	Not applicable					
15.	I was satisfied with the level of attention, care, and support received during the consultation.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree	Not applicable	Comments:
For all respondents:								

16.	I fully understand the patient-initiated review process.	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree	Comments:
17.	Overall, I am satisfied with the patient-initiated review approach .	Strongly agree	Agree	Neither Agree nor disagree	Disagree	Strongly disagree	Comments:

18.	Did you reach out to other healthcare professionals / services with any problems related to your joint replacement?	A.	GP	Please specify the reasons:
		B.	A&E	Please specify the reasons:
		C.	Physio	Please specify the reasons:
		D.	Others_____	Please specify the reasons:
19.	We would really value any additional comments you may have about your experience with the Golden Jubilee PIR service after your joint replacement.			