Comisiwn Bevan Commission

Challenge, Change and Champion Series
Supporting sustainable recovery

Protected Elective Surgical Units (PESUs) in action

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Introduction

The Covid-19 pandemic has severely impacted upon countries bringing many challenges to health and care systems globally. Crisis management including the reallocation of scarce resources and prioritising Covid-19 patients has resulted in extended elective surgical waiting list times and the ongoing and growing challenge of tackling the backlog across the board. Even when service closure was not an option, the realisation was apparent that 'business as usual' was not going to work.

It is important to remember that prior to the pandemic, there were already major challenges with surgical waiting times in Wales. The backlog in elective surgical care has been severely impacted with a substantial and sustained reduction in operational capacity, only partly mitigated by a reduction in referrals. A 2021 report published by the Bevan Commission, Doing Things Differently: Tackling the Backlog in the Aftermath of Covid-19[1] , describes the problems facing NHS Wales, with almost 680,000 patients were reportedly waiting for elective surgery treatment in December 2021.

This long wait problem for people requiring surgical procedures requires leaders in healthcare and policy makers to take on the challenging task of ensuring patients do not come to harm whilst waiting for surgery, and to ensure adequate access to support and care in the interim.

This resource aims to set out some simple keys to success for the introduction of Protected Elective Surgical Units (PESUs) to help ensure the continuation of surgical services for patients undergoing urgent or complex elective surgery in an environment where they are protected from acquiring Covid-19 and other infections pre and post operatively. This is not seen as a temporary measure and is aligned with the goal of maximising patient care through safe and efficient work practices as part of a more robust system for elective surgical services. This is seen as a sustainable healthcare delivery model.

[1]*www.bevancommission.org/publications/doing-things-differently-tackling-the-backlog-in-the-aftermath-of-covid-19/*

What are Protected Elective Surgical Units (PESUs)?

PESUs are the creation of dedicated and protected spaces for patients undergoing elective surgical care of any complexity, thereby separating these patients from those admitted for urgent or emergency surgery and patients with acute medical conditions.

The logic is that placing patients with acute medical conditions alongside patients recovering from complex elective surgery is not ideal and at times can be detrimental to recovery. Early learning from the pandemic suggested a very high risk of mortality was associated with patients acquiring Covid-19 during their perioperative period.

This concept of having protected spaces for elective surgical care is not totally new. A report from Royal College of Surgeons of England (RCS) in 2007 highlighted that there were justifications for separating elective surgical admissions from the medical and surgical acute patients admitted through the emergency stream.

In 2021, RCS recommendation of 'COVID light zones' introduced into a private sector single tertiary hospital ward in England, UK were able to continue to offer urgent elective hip and knee surgery as waiting lists increased.

Following a similar concept to Covid-light zones, Protective Elective Surgical Units (PESUs) were designed for pre and post operative elective surgical procedures. Piloting designated COVID green zones in three tertiary hospitals in Wales, created the safest possible environment, matching specific surgical skills and resources to manage the complexity of elective surgery cases.

Although initially developed to resume urgent and complex elective surgery cases and manage the backlog during the pandemic crisis, PESUs have demonstrated success and the model is ready for adoption by hospitals and units that provide elective surgical care.

Royal College of Surgeons recommendations and outcomes:

- Assigning dedicated elective surgery beds, staff and theatre which are not taken over by unplanned emergency caseload.
- Optimising operational flow by concentrating on doing a limited number of practices well.
- Better infection control referenced to C, difficile, MRSA and MSSA infections as well as Covid-19.
- 'Covid light' zones and 'Covid green zones' implementing pre and post screening of patients and centralised specialised staff proven to reduce patient exposure and transmission of Covid-19.

Why implement PESUs?

The high risk of mortality associated with patients acquiring Covid-19 during their perioperative period expedited the case for change. Covid-19 infection could arise due to lack of detection on admission, creating a threat to the individual and surrounding patients, or be acquired from the hospital environment, from an asymptomatic member of staff or other infected patients.

During the height of the crisis, the primary aim of many hospitals was to ensure patients needing urgent or complex elective surgery did not acquire Covid-19 pre or post operatively, as well as an imperative to deliver the safest environment possible for elective surgical procedures at all levels of complexity in a protected and predictable environment. There also existed an opportunity to develop more robust systems to maximise care through efficient and safe working practices minimising the cancellation levels due to seasonal emergency pressures.

A Wales NHS and Singapore (2021) study also demonstrated a significant reduction in health-care-associated or hospital-acquired (nosocomial) infections brought about by good adherence to personal-protective-equipment and hand hygiene. Such practices have an economic impact and result in improve patient outcomes and cost savings. Indications are that Healthcare Acquired Infections (HCAIs) have a cost of around £50million in Wales with an average 6.4 days longer hospital stay for patients, depending on the type of infection.

To reduce the risk of Covid-19 transmission and infection, implementing the safest practices for patients and staff involves the creation of separate, self-contained, surgical areas which are capable of collectively delivering the full range of surgical complexities to the highest standards. The PESUs have to be appropriately staffed to meet patients' needs, with predictable bed access and a limited range of different surgical disciplines. Hence, the concept of PESU was born from within the Cardiff & Vale University Health Board.

Key Principles:

- Create the safest possible environment matched to the complexity and specific type of elective surgery undertaken in that unit.
- Create the right setting for each patient group with the most appropriate clinical teams around them to deliver the best and most comfortable experience for the patient.
- Reduce the hospital stay to the shortest period possible.
- Reduce transmission of hospital acquired infections including C. difficile, MRSA and MSSA infections as well as Covid-19.

How to deliver a PESU?

Creation of Covid-19 free safe surgical zones involves a redesign of the hospital "footprint" to appropriately accommodate elective surgical flow. The detail on how to action PESUs is based on models developed, implemented and evaluated in three hospitals in Wales during the pandemic crisis.

The main concept is that all patients and staff footfall are physically protected and separated from the unpredictable medical and surgical admissions of patients with unknown or uncertain Covid-19 status.

The aim was to include all levels of complexity and a Post Anaesthetic Care Unit (PACU) within the PESU managed by dedicated anaesthetic staff and specialist nursing team. The design was shaped around the available NHS estate and its infrastructure that best fit with save patient flow, both ingress and egress but also ensuring there was flexibility to adapt and change easily. To maximise surgical delivery, multiple units were required, each designed for a specific and dedicated purpose.

Redesigning inpatient elective surgery workflows involved prioritising routine and urgent care (levels 1-4) and creating Covid-19 green, amber and red zones. Introducing specialised clinical nursing and anaesthetic expertise to the area allowed the process to be efficiently streamlined. The green zone used monitoring tools and protocols to facilitate pre-assessment, screening, social distancing and testing of elective patients prior and post-surgery.

Whilst this was taking place, the Outpatients Department(s) focused on appointments prioritisation and capacity redesign to support managing the elective surgery backlog, establishing the triaging of patients and applying standardised care pathways for acute to critical care and follow up. Through a clinician-led vetting process, patients deemed to be lower risk were able to access virtual/online consults follow-up visits with a GP or the patient (using online platforms) or at Covid safe clinic locations. Once isolated from the unplanned admissions, patients from the predictable elective stream can be pre-assessed, screened and Covid-19 tested prior to surgery, minimising their risk of introducing infection into a given unit.

Introducing a PESU

- Patients and staff footfall are physically protected and separated from the unpredictable medical and surgical admissions
- Redesigning inpatient elective surgery workflows involves prioritising routine and urgent care
- Focus on prioritisation and capacity redesign to manage the elective surgery backlog
- Establish triaging of patients on admission to the ward, and applying standardised care pathways

Key Findings

Three different versions of a PESU have been successfully implemented on three very different sites each with its own unique challenges. Adoption of PESUs have been shown to have significant cost and healthcare quality benefits to the organisation and the wider NHS.

The level of resources required, and risks taken through creating PESUs would have been extremely difficult to create or justify in the pre Covid-19 NHS. However, the benefits have been substantial. They have delivered a zone in which patients undergoing surgical procedures is free from distraction, getting the right care to patients at the right time and thus offering them the best outcome and experience available.

Their introduction has resulted in an enhanced level of peri operative care and timely surgery to some of the most vulnerable patients through the worst crisis in the history of the NHS. In addition, the organisation has a level of certainty and safety for its patients. Furthermore, good adherence to personal-protective-equipment and hand hygiene kept other HAI rates stable even during the ongoing pandemic where respiratory infections were prioritised for admissions and interventions.

While no patients were infected with Covid-19 while an inpatient in a PESU, a small number of patients had, however, acquired Covid-19 in the community, post discharge, in the 30 days post surgery. A similar study (in Singapore) indicates that multimodal Infection Protection and Control (IPC) strategies introduced during the pandemic have been associated with a decline in MRSA acquisition rates together with central-line associated bloodstream infection rates, likely due to increased compliance with Standard Precautions. This emphasises the need for balancing Covid-related demands with routine hospital infection prevention. This model of care could likely be implemented in any hospital where emergency patient workflow competes with complex/urgent planned care.

Main patient outcomes

- Over 15,000 procedures across the full range of surgical disciplines and associated complexity in PESUs.
- No patients infected with Covid-19 while an inpatient in PESU.
- Zero C. difficile, MRSA or MSSA infections patients managed in PESU to date.

Organisational inputs

What is needed?

- Shared space for all surgical specialties
- Infection prevention and control (IPC) at the heart of decision making and patient safety
- Robust pre-assessment pathway with 14 day / 3 day self-isolation for patients prior to surgery
- Single point of entry for patients and staff into the protected space
- Dedicated teams from all disciplines; both clinical and support services
- Direct access to dedicated theatre
- Direct access to dedicated PACU
- Flexible theatre lists which were aligned to clinical prioritisation
- Close watch on behaviours to ensure compliance against IPC and different ways of working
- Clear internal policies and procedures based on design and delivery principles. SOP and escalation
- “Step up / Step down” levels with agreed controls based on community and hospital Covid prevalence

PESUs focus on continuation of urgent and complex elective surgery by creating Covid-19 free zones. This protects patients from acquiring Covid-19 pre and post-operatively and creates the safest possible environment for patients and staff to continue ‘business as usual’.

Patients being cared for in the PESUs were asked to self-isolate for 14 days prior to the planned surgical procedures with the usual Covid-19 testing in place. Designing Post Anaesthetic Care (PACU) with PESU managed by dedicated anaesthetic and clinical staff in protected areas, prevented the risk of infected staff entering Critical Care Units and potentially exposing patients to Covid-19.

The PESU model requires embracing a radical and transformational change across the NHS requiring thorough strategic planning in order to deliver a service that is efficient, effective and of a high quality.

As implementation requires physical spaces that are equipped for surgery, it may be necessary to establish a relationship between the NHS and private sector to ensure elective care can be delivered.

Engaging skilled resources, collaborative and cohesive teams, and the public, creates a multi-specialty and multi-professional environment that aims to deliver wider benefits across the NHS in Wales.

Redesigning and standardising care pathways

Covid-19 has provided many positive opportunities for transformation of outpatients and inpatient elective surgical services. This includes reviewing and standardising care pathways and adopting digitally enhanced strategies to streamline inpatient and outpatient processes.
This is all part of the changes that are needed to make PESUs work seamlessly and efficiently.

The first step in managing the waiting list begins at the start of the referral pathway where a key activity is to eliminate all unnecessary appointments and prioritise urgent patients. Clinicians from various surgical and anaesthetic specialties collaborate and combine their specialist skills, expertise, and resources to design and implement standardised care pathways. This is all time well spent. For example, a clinician-led vetting process can be established to assess low to high-risk patients pre-operatively enabling an effective triaging and prioritisation process for patients requiring surgical procedures. Alongside this process, seeking information from the patient on their living environment, eg stairs, trip hazards, bathroom adaptations, will be beneficial to facilitate a smooth discharge and recovery.

Assigning surgical scores to patients coupled with a strong adherence to the clinical pathway recommendations will reduce the time spent in hospital to the safest and shortest length of stay. This can be achieved whilst maintaining the safest environment for patients undergoing elective surgery and avoiding HCAIs.

The post-operative care pathways design includes managing follow up care via virtual/online consultations using the available online platforms and through community-based clinics where possible alongside PIFU and SOS.

In order to optimise recovery, with the agreement of the patient, family members or a person providing support on discharge, should receive information about post-operative rehabilitation and how they can help the patient with their mobility, surgical dressing management, simple dietary advice etc. The information should include how to seek additional advice and support if required during the post-surgical phase, such as a helpline.

Adopting standardised healthcare pathways as an organisation-wide approach for all elective surgical care makes it possible to implement PESUs effectively, streamlining operations and improving patient care, patient experience and outcomes.

Key enablers relating to staffing

At the time of health emergencies, large numbers of staff are likely to be reallocated leaving a significantly depleted core staff to manage and undertake surgical procedures. The creation of PESUs is likely to reduce the likelihood of reallocation as a result of a future emergency situation.

Given the extremely limited bed capacity, and a significantly constrained and depleted medical, nursing and allied health workforce the concept of multidisciplinary wards can be used as a means of bringing together a smaller team. It is important to remember that these wards unusually, place staff in relatively unfamiliar environments.

So, a team of key personnel from all relevant clinical disciplines, operational management, estates, IPC and dedicated individual support from the corporate Improvement & Implementation service is essential. Senior nursing leadership is crucial for bringing together an intelligent mix of experienced specialist nurses with others of similar experience. This creates a safe and supportive learning environment within the PESU.

A small but determined team all need to understand the vision and be supported to enable them to be fully committed to creating the PESU. The philosophy is to work smarter not harder. The team needs to be empowered to deliver specific objectives.

Important points to consider:

1. Separate entrances for staff and patients need to be created with separate changing rooms.

2. Staff need to be timetabled to only work in the PESU for their entire shift. Robust procedures are designed in relation to PPE and the movement in and out of the units. These rules will vary depending on the prevalence of Covid-19 in the community.

3. Patients who require Enhanced Care post-operatively are managed by dedicated anaesthetic staff in Post Anaesthetic Care Units (PACU) created inside the PESU, avoiding the risk of entering Critical Care and possible exposure to Covid-19.

4. Importantly, the PESU also provides a safe working environment allowing vulnerable staff to return to work in the knowledge that they are in a Covid-19 free area.

Key enablers for the Implementation Leads

1. The single most important enabler for PESUs is engaging all team members in understanding and applying the principles and ensuring that the model is effectively adapted to work in the new environment.

2. Freely available and daily updated data is key. Information and data sharing across all parts of the system so that it is seamless and expected. All parts of the system should become visible to the other parts. The classic NHS, siloed, limited knowledge, system unaware, unconnected decision making, "business case" approach to problem solving does not work here.

3. Regular focused purposeful daily meeting should become routine when setting up and managing PESUs.

4. Innovative problem-based thinking needs to be openly encouraged. These activities can evolve and mature as staff and executives become more confident of our trajectory. During the early phases of the pandemic, the team may be very time-rich due to the disruption in usual workflows and the time can be redirected to implementation.

5. Access to corporate functions is essential, particularly dedicated estates teams to deliver the redesigned footprint at pace.

Who should be involved?

- Estates
- Informatics
- Finance
- Clinical leadership
- Infection, Prevention and Control Team
- Specialist Nurses
- Allied Health Professionals
- Junior Doctors
- Primary Care Teams
- Ward Managers
- Project management expertise
- Medical School
- Executive Leaders
- Patient Co-ordinators
- Trained volunteers with lived experience

Key lessons, learning and performance

Action learning, risk assessment and monitoring performance are an important part of implementing PESUs.

- Key themes need to be developed, and timelines produced to facilitate rapid response and change.
- Solutions need to be designed around the available facilities and modelled for best fit in supporting several services. This will require moving services into the most appropriate part of the available estate that best fits the needs but doesn't introduce or exacerbate risk or compromise care. This could include multiple sites and may involve solutions between public and private healthcare facilities.
- Multiple planning cycles, and possible scenarios will need to be rapidly tested and evaluated to produce the optimum delivery model for each environment. This can be achieved through utilising large meeting rooms and lecture theatres to maximise discussion, assess risks and practical feasibility of any proposed design solution.
- The implementation of clinical audit tools and monitoring clinical outcomes and 30-day morbidity and mortality is an essential risk mitigation step. The emerging data from such audits during the early implementation plays a key role in assuring the teams and for maintaining or improving safe practice.

Key success factors:

- Plan activity for fifty weeks per year.
- Create a multi-speciality and multi-professional environment for continuous learning and cross fertilisation of clinical skills and operational practices.
- Use the model to forecast required capacity to reduce existing delays and potentially share the burden across the Health System.
- Drive theatre utilisation through focused elective uninterrupted pre- (POAC) and post-operative pathways, including PACU when indicated.

Some of the challenges to consider

Moving large parts of the service simultaneously with interconnected dependencies requires considerable individual and team effort. Collaborative coordinated and goal centred thinking is essential and should be routine. Everyone may understand the problem; however, the greatest challenges may still come from explaining the need at a departmental and getting buy-in for the proposed change, especially where people may need to physically move their workplace to alternative sites or a change in practice is necessary.

Here are some challenges to think through:

- Creating separately staffed zones that requires separate timetabling can be problematic for the workforce. Managing small surgical teams with highly specialised skills with a depleted medical and surgical workforce will be especially difficult.
- Clinical ownership and delivery of solutions through frequent and sometimes difficult but purposeful constructive sessions with senior clinical staff will be a key feature of a problem solving, solution finding approach to the task.
- Information, relevant data and transparency creates a collective understanding to ensure all patients and staff needs are taken into consideration. It is the responsibility of the PESU management team to do this together with responsive organisational support.
- The belief and understanding that when potential solutions are proposed, rapid organisational identification of what could, might or would not work, needs to be rapidly realised. This can truly be a new way of working and may not be comfortable for all team members.

Protective Elective Surgical Units

Why established PESUs

- Managing elective surgical waiting lists and future cases
- Creating safe and effective working units etc
- Prioritising and fast tracking patients with time sensitive cases
- Using estates flexibly increasing and decreasing based on demand and need

STANDARDISED CARE PATHWAYS

Prioritising patients, triaging and care pathways for all of elective surgical care.

COVID LIGHT / GREEN ZONES

Creating dedicated green zones with infection control measures and self-isolation and dedicated staffing used to protect units

DIGITALLY ENHANCED PRE AND FOLLOW UP CARE

Online/virtual consultations with direct access between Consultants and GPs as well patients

SAFE AND UNDISRUPTED ELECTIVE SURGICAL CARE

HEALTHCARE AND HOSPITAL ACQUIRED INFECTION

Reduced hospital acquired infections through

ROBUST PROCESSES SET UP FOR THE LONGER TERM

In Summary

Implementing dedicated PESU shows many benefits to help manage the backlog and extended waiting times for an increasing number of patients in need. They provide a positive way forward to help manage the many non high-risk patients requiring surgical procedures in the future.

Covid-19 has also highlighted the great mental and physical burden on many NHS staff, reinforcing the importance of both adequate staff numbers and their welfare to the delivery of services. As we emerge from the pandemic, we should be mindful of the demands on staff to date and the need to improve morale before moving headlong into tackling the backlog.

The pandemic has raised opportunities for different ways of working, training, and the need to facilitate learning. It has also highlighted the need to consider creative recruitment options, exploring hiring of retired staff who may be interested in part-time, different roles or volunteers to help reduce some of the burden on NHS staff and upon an already fragile health system.

Despite this risk, there were many secondary and tertiary services where closure of elective surgery during a health emergency was not an option or was a high risk decision. Providing care to a full range of surgical specialities involves caring for patients with time sensitive diseases which will deteriorate without urgent or timely intervention.

Further Reading

Evaluation of PESUs in Wales by;

- Alun Tomkinson, Clinical Board Director Mike Bond, Operational Director

- Abrie Theron, Clinical Director Anaesthetics & Theatres Surgical Clinical Board, Cardiff & Vale University Health Board December 2021

https://www.bevancommission.org/app/uploads/2022/02/Swansea-Bay-PESU-AT.pdf

Glossary

HCAI – Healthcare Acquired Infection

IPC – Infection Protection and Control

MRSA - methicillin-resistant Staphylococcus aureus

MSSA - Methicillin-sensitive Staphylococcus aureus

PACU – Post Anaesthetic Care Unit

PESU – Protective Elective Surgical Unit

PIFU – Patient Initiated Follow Up

POAC – Pre-operative Assessment Clinic

RCS – Royal College of Surgeons

SOP – Standard Operating Procedure

SOS – See on Symptoms Assessment