Clinical Excellence Division

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Operating Theatre Efficiency

Guideline

Queensland Government

Operating Theatre Efficiency

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1. Summary

The Queensland Government's, 'My health, Queensland's future: Advancing health 2026' strategy describes the challenges faced by public healthcare in Queensland, "Our population is ageing. A growing number of Queenslanders live with chronic disease. Better clinical interventions and new technologies offer the prospect of improved health outcomes. But health costs are rising and we need to be smarter about how we deliver healthcare into the future."

Further to this and in support of the need to deliver sustainable, efficient and effective services, in April 2016, the Queensland Audit Office (QAO) published the Queensland public hospital operating theatre efficiency report 2015-16. The report concluded that, "Public hospitals can substantially improve their theatre efficiency, both by increasing utilisation and by better managing their costs of surgery. That more can be done within existing theatre infrastructure is indicative of the potential cost savings that can be realised in the system."

There were ten recommendations made in the report, including the need for the development of standardised definitions, performance measures and targets, improving operating theatre governance, reviewing theatre schedules and staff rosters and improving costing and coding services.

The following guidelines have been developed as a best practice guide for Hospital and Health Services (HHSs) to understand and improve theatre efficiency, governance and operational management.

2. Scope

The guideline applies to all operating theatres in public hospitals in Queensland, referred to hereafter as Hospital and Health Services (HHSs) including Mater Public Services.

Compliance with this guideline is not mandatory, but sound reasoning must exist for departing from the recommended principles within the guideline.

It is recognised that there are many aspects of operating theatre efficiency and management that are not addressed in version 1.0 of this document. As future versions of this guideline are developed over time to stay up to date with best practice, additional influences will be addressed, including;

- Workforce standards
- Quality and safety
- Operating theatre costing
- Evidence-based scheduling
- Emergency surgery

Both the guideline and the associated measures and key performance indicators (KPI's) are developmental documents that will be reviewed and expanded as part of a staged implementation plan.

It is important to note that where measures and KPI's have been described, statewide targets will not be set for the first year of implementation. The approach to establishing targets and benchmarks will follow a progressive, evidence-based approach whereby collection for the first 12 months will focus on assessing relative performance to enable the Department to understand the level of variation. This will ensure appropriate targets are set in the future with the expectation that these will be applied as stepped improvement targets from Year 2 of the implementation plan.

3. Guidelines

3.1 Purpose

The purpose of the Queensland Health Theatre Efficiency Guideline is to provide a best practice guide for operationally managing efficient public hospital operating theatres by:

1. Providing a minimum suite of agreed upon definitions, performance measures and targets to support Hospital and Health Services and hospitals to manage, benchmark and improve theatre performance;
2. Clarifying and formally communicating roles, responsibilities and accountabilities for delivering efficient surgical services, both operationally and strategically;
3. Outlining the governance structure (e.g. Theatre Management Committee) by which public hospitals should monitor the efficient use of theatres; and
4. Highlighting the major cost drivers of operating theatres

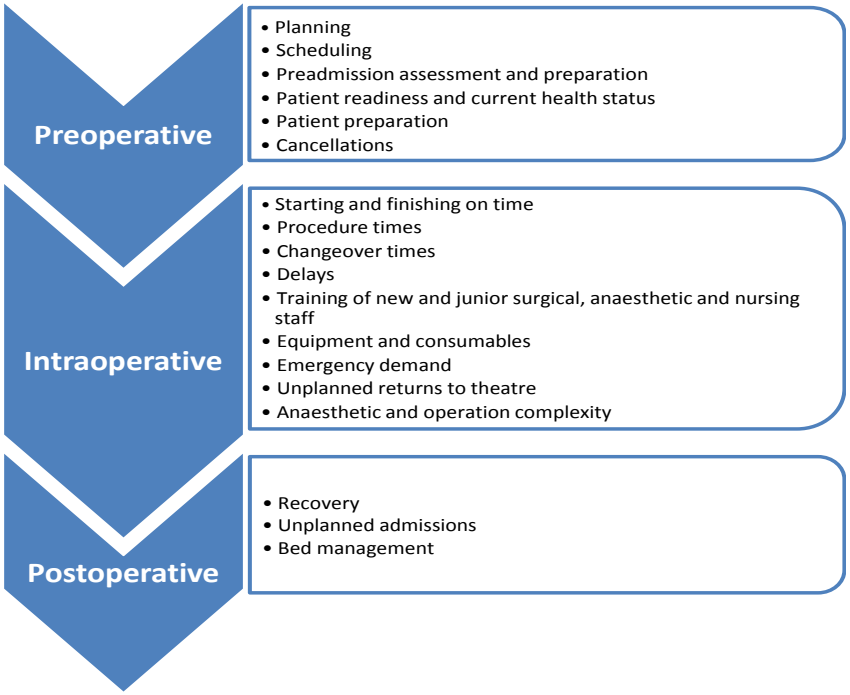
The primary focus of the document is planned (elective) surgery, though it is expected that some aspects will also be relevant for unplanned (emergency) surgery.

3.2 Understanding Theatre Efficiency

3.2.1 The Whole Patient Journey

There are numerous factors within the perioperative setting that influence the efficiency of operating theatres. Such factors extend beyond the immediate theatre environment and include the entire continuum from planning, scheduling, pre-assessment and through to discharge. The following diagram represents the three primary phases of the perioperative setting that contribute to the efficient and productive use of operating theatres and associated resources.

Figure 1 **Key Influences within the elective perioperative environment**



It is imperative that operating theatres are not seen in isolation. The patient's surgical journey is complex and crosses many boundaries. Whilst the scope of this document does not currently address the following factors, improving operating theatre performance must also be considered in the context of a wider system, including:

- Quality assurance and safety processes
- Staff availability, skill mix and experience
- Theatre size and layout
- Hospital size and layout
- Patient flow and communication processes
- Culture of the theatre team/hospital

Staff morale, job satisfaction and the culture of theatre teams and hospitals play a significant part in the success and delivery of all health services, and are crucial to the longevity of any change (Stapleton *et al* 2007). Thus, it is important that when undertaking change management initiatives, managers understand and make deliberate efforts to actively engage their staff and ensure high morale is maintained. This should, in-turn, increase the effectiveness of change processes necessary for improving theatre efficiency on a sustainable basis.

Moreover, a patient-centred approach must be taken when developing new strategies and/or making changes to processes and it is recommended that patient consultation and feedback, where appropriate, should also underpin decisions around changes to aspects of perioperative care.

3.2.2 Defining Utilisation, Efficiency and Productivity

Historically, the concept of theatre efficiency has been misrepresented by the common inference that high theatre utilisation is equivalent to efficiency. However, it is vital to understand and differentiate between theatre utilisation, efficiency and productivity.

Theatre utilisation only reflects the amount of time a patient is in the operating theatre within a planned session, and is not an indication of how productive that time is. Thus any analysis of utilisation must also consider a hospital's surgical services efficiency, productivity and complexity as well as the effectiveness of planning to maximise capacity and deliver on planned activity.

For example, two comparable operating theatres could fully utilise their available, planned 'In OR' time without any delays, late starts or cancellations. Another theatre may consistently deliver more activity by completing like procedures quicker, despite delays or late starts.

Similarly, an operating theatre could work to improve their performance by employing more staff (e.g. additional layers of management, additional anaesthetic staff to reduce changeover times etc.) however this may not necessarily improve efficiency nor be cost-effective.

In an Activity-Based Funding (ABF) environment, a better measure of technical efficiency for surgical services is the cost per Weighted Activity Unit (WAU) delivered by the service. However, limitations in how both costing and activity are able to be attributed solely to the operating theatres means that this measure is primarily useful for monitoring the efficiency of the whole of services, and the activity delivered across all Diagnosis Related Groups (DRGs).

Likewise, a reasonable indicator for productivity for surgical services is the WAU delivered per hour of staffed theatre time. Again, due to limitations in apportioning activity solely to the operating theatres, this measure is primarily useful at a whole of services level.

For the purposes of this guideline, operating theatre efficiency is defined as treating the right patients and providing the right care, within clinically recommended timeframes, with the optimal use of the resources required to deliver safe, quality care at or below an efficient price for the service.

3.3 Operating Theatre Measures and Metrics

3.3.1 Context

It is important to note that, currently, operating theatre efficiency as defined in section 3.2.2 cannot be measured reliably through the use of a single indicator. There is also significant risk in misrepresenting operating theatre performance based on one or only a few indicators. Hence, the purpose of this document is not to prescribe an overall performance indicator but to provide an operationally meaningful and useful guide that will assist managers to understand their business, identify root causes of inefficiencies and drive improvement strategies.

The measures outlined in this guideline have been designed to balance what information is readily available with what is a relevant and actionable suite of indicators to assist Hospitals and HHSs in monitoring and managing their theatre performance. Whilst they represent a minimum recommended set to monitor theatre efficiency, individual hospitals may seek to adopt additional indicators dependent on local needs and circumstances.

Not all hospitals and surgical specialties have the same operating theatre performance profiles and consideration needs to be given to individual differences including surgical complexity and case mix. For example: short stay cataract surgery and intracranial surgery will have considerably different metrics, as will comparing regional or remote hospitals to tertiary hospitals.

Whilst specific quality and safety indicators are not included in the scope of these guidelines, it is the expectation that the principles of delivering safe and quality healthcare underpin all services provided by Queensland Public Hospital and Health Services.

3.3.2 Using Measures and Metrics

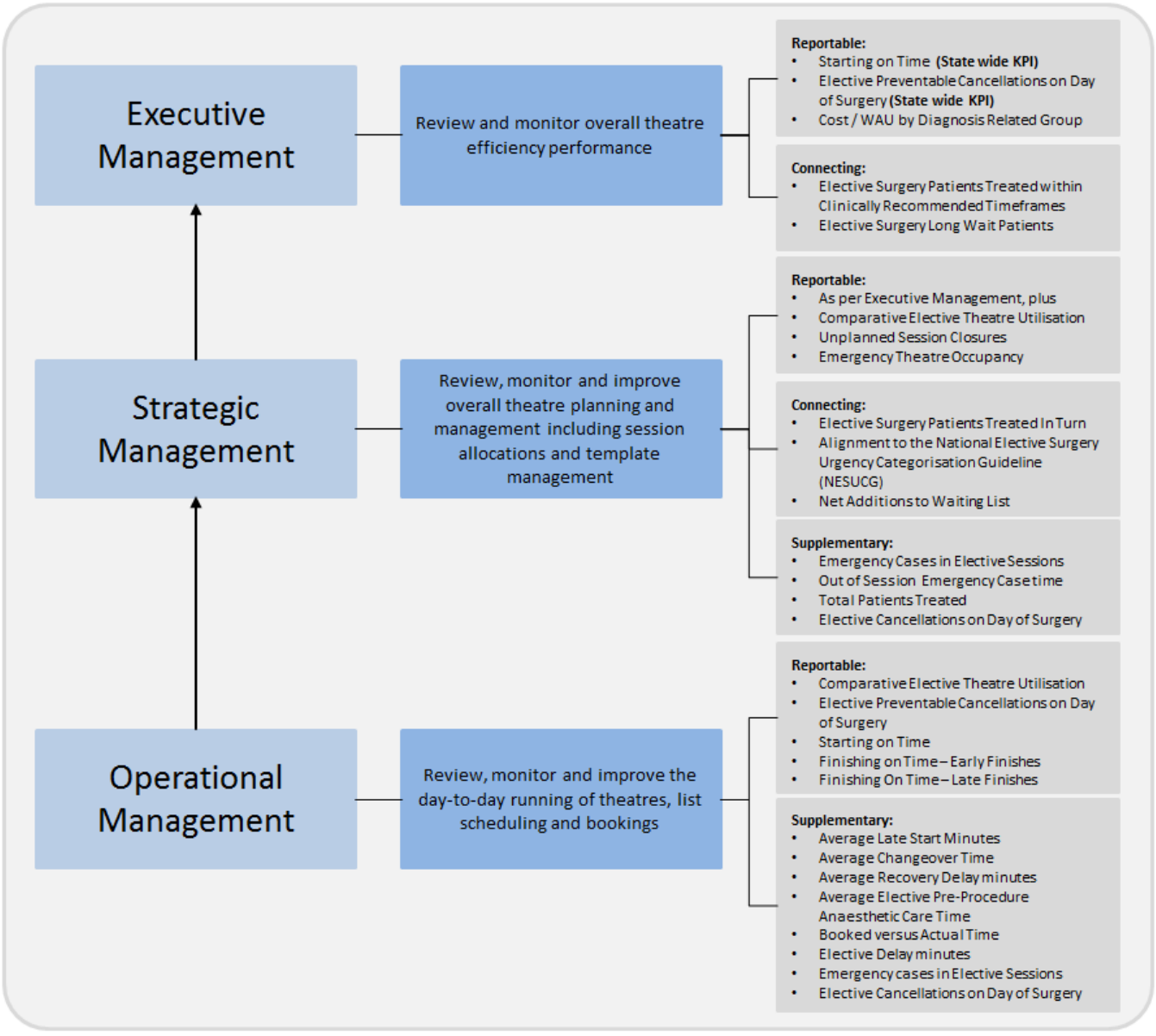
Not all measures will be relevant for all stakeholders even within a HHS, and those useful at an operational level will vary to those required at a strategic and executive level.

Hence, a range of measures across the perioperative setting have been recommended in this guideline however they have been classified to ensure relevant stakeholders have access to the appropriate reports to prevent being inundated with data. Some measures provide an overarching view of key efficiency indicators (e.g. starting on time, early finishes, cancellations) whereas others provide supporting information that can act as a subset of measures to assist with identifying root causes of issues or changes in performance.

The following terms have been used to classify the measures according to their use:

- A **reportable** measure is one considered necessary to report and monitor on a regular basis
- A **connecting** measure is one that links operating theatre performance to the HHS Service Agreement Key Performance Indicator for elective surgery
- A **supplementary** measure is one considered as not being routinely required however should be readily available to support root cause analysis of issues

Figure 2 Classification of measures and metrics by governance group



It is also important that staff responsible and involved in delivering improvements to theatre efficiency have regular access to a range of reports. This is vital for establishing and maintaining engaged teams and also enables the opportunity for teams to be recognised for their achievements and/or raise awareness of areas where further improvement is required. Access to reports on the following measures should be available to all perioperative staff:

- Comparative Elective Theatre Utilisation
- Starting on Time
- Finishing on Time (Late Finishes)
- Finishing on Time (Early Finishes)
- Elective Preventable Cancellations on Day of Surgery
- Total Patients Treated
- Elective Surgery Patients Treated in Clinically Recommended Time by Category
- Elective Surgery Long Wait Patients

Further details regarding theatre governance are outlined in section 3.4.

3.3.3 Description of Measures

A description of each of the measures is outlined below. It is recommended that reporting and management of such indicators should be undertaken at a specialty level (where relevant) to promote accountability and to drive targeted improvements.

Standardised definitions are fundamental for ensuring all metrics are measured accurately and consistently to enable reliable internal and, where applicable, external benchmarking. All relevant definitions referenced within these guidelines can be located in Appendix B.

Table 1 Description of Measures

R = Reportable C = Connecting S = Supplementary

	Measure	Type	Description
Whole of patient journey	Cost per weighted activity unit (WAU)	**R**	Cost per weighted activity unit (WAU) by surgical diagnosis related groups (DRG).
	Elective Surgery Patients Treated within Clinically Recommended Time	C	The percentage of patients who received elective surgery and were treated within the clinically recommended time for their urgency category.
Preoperative / Waitlist Management	Unplanned Session Closures	**R**	The percentage of how many planned elective sessions are closed at late notice (within 48 hours of the planned session time) of the total number of planned elective sessions.
	Elective Surgery Long Wait Patients	C	The percentage of patients waiting longer than the clinically recommended time for their Category 1, 2 or 3 Elective surgery.

	Net Additions to Waiting List	C	The difference between the number of patients added to the elective surgery waiting list and the number of patients removed (either treated or removed).
	Treat In Turn	C	The percentage of Category 2 and 3 Elective Surgery patients treated in turn.
	Alignment to National Elective Surgery Urgency Categorisation Guideline	C	The percentage of patients whose assigned clinical urgency category aligns with that described in the National Elective Surgery Urgency Categorisation Guideline.
	Booked versus Actual Time	S	The comparison between booked total case time (how the session was planned to be used) and actual total case time (how the session was actually used).
	Total Patients Treated	S	The total number of patients treated by operation type (elective or emergency).
Intraoperative	Comparative Elective Theatre Utilisation	**R**	A comparative measure of overall theatre utilisation that considers the total time the operating theatre is actually occupied by a patient in the OR and the necessary time for changeover (by applying a nominal changeover time) as a percentage of the planned time for elective sessions. This measure is designed to reconcile the differences in reported utilisation between sessions with multiple short cases and sessions with few long cases. It allows managers to focus on the root causes of low utilisation i.e. late starts, slow turnovers and early finishes. However, it does not reflect the speed at which a procedure is performed. The occupied 'In OR time' is measured according to the fundamental 'Wheels in, Wheels Out' measure. The nominal changeover time is set at 15 minutes.
	Starting On Time	**R**	Percentage of elective sessions where the first case In OR time is on or before the scheduled session start time. A late start is defined as any session where the first case In OR time is after the scheduled session start time.

	Finishing On Time – Underruns (Early Finishes)	**R**	The percentage of elective sessions where the last case exits the OR 45 minutes or more before the scheduled session end time. An early finish is defined as any session where the last case exits the OR greater than 45 minutes before the scheduled session end time.
	Finishing On Time – Overruns (Late Finishes)	**R**	The percentage of elective sessions where the last case exits the OR 30 minutes or more after the scheduled session end time. A late finish is defined as any session where the last case exits the OR greater than 30 minutes after the scheduled session end time.
	Elective Preventable Day of Surgery Cancellations	**R**	The proportion of patients booked into elective sessions who are cancelled on the day of surgery for selected preventable cancellation reason codes (See Appendix A).
	Average Changeover Time	S	The average time between all cases treated in elective sessions measured from previous case 'Out OR' to next case 'In OR'.
	Elective Cancellations on Day of Surgery	S	The percentage of all elective patients cancelled on the day of surgery for both hospital and patient initiated reasons.
	Average Elective Pre-Procedure Anaesthetic Care Time	S	The average time from 'In Anaesthetic' to 'Procedure Start' for the first case of an elective morning or all day session.
	Average Late Start minutes	S	Of those lists starting late, the average time (minutes) by which they started late. A late start is defined as any session where the first case In OR time is after the scheduled session start time.
	Elective Delay minutes	S	The total delays (in minutes) resulting from late starts (first case In OR time is after the scheduled session start time) and prolonged changeover times (change over time >15 minutes).
Postoperative	Average Recovery Delay between ready for discharge to discharge	S	The average time taken between when an elective patient is ready for discharge to when they are actually discharged.

Impact of Emergency Surgery	Emergency Theatre Occupancy	**R**	A measure of 'In Operating Room' use that reflects how much time the operating theatre is occupied by a patient as a percentage of the planned time for emergency surgery sessions. This is measured according to the fundamental 'Wheels in, Wheels Out' measure.
	Emergency Cases in Elective Sessions	S	Percentage of planned Elective session time occupied by Emergency cases.
	Out of Session Emergency Case Time	S	Emergency case minutes performed out of session (i.e. not within a planned session) as a percentage of the total emergency case minutes completed by category A - E.

Other metrics which may be useful for HHSs to consider include:

- Proportion of Eligible Day/Extended Day/Day of Surgery Admission cases that were treated as Day/Extended Day/Day of Surgery Admission cases
- Unplanned Admissions
- Unplanned returns to theatre (in relation to the effect on available theatre time and productivity, as opposed to quality and safety)

3.3.4 Benchmarking

Benchmarking should only be undertaken between peer hospitals, taking into account:

- Case mix
- Training requirements
- Physical layout (e.g. anaesthetic bays)
- Volume of elective and emergency surgery patients
- Facility capability according to the Queensland Clinical Services Capability Framework

As a guide, peer hospital groupings are recommended according to acute hospital category and remoteness as per The Australian Institute of Health and Welfare (AIHW) revised peer groups, published on the AIHW website. Hospitals grouped under both the same acute hospital category and by the same/similar remoteness area classification could be considered peer hospitals for benchmarking purposes. However, it is important to note that variations based on the above list of factors may still exist between these groupings of peer hospitals and thus further consideration to such differences should also be taken into account.

3.3.5 Data Quality

The significance of data integrity and quality must not be underestimated within the context of quality improvement. Whilst it is acknowledged that variation in process may exist, it is crucial that standardisation of data entry and the application of prescribed definitions to each of the data elements and time stamps remain consistent. This is to ensure comparable and reliable benchmarking as well as best practice clinical record-keeping.

To ensure data integrity and consistency, it is recommended that HHSs:

- Ensure staff are provided adequate and ongoing training in the use and application of the relevant operating room management information systems, including an understanding of how the data is used and the impacts of poor data quality
- Ensure access controls are in place, including approval and verification processes for new users to ensure appropriate levels of access are assigned
- Maintain an up-to-date access and training register for all relevant staff
- Develop and make readily available orientation and desktop manuals for the use and application of operating room management information systems
- Display cheat sheets at theatre work stations that draw attention to important data entry instructions as well as ensure access to time stamp definitions for quick reference
- Regularly audit data entry for accuracy, completeness and timeliness
- Regularly audit user access and remove access for staff where no longer required

3.4 Managing Efficient Operating Theatres

3.4.1 Operating Theatre Governance

As previously noted, improving operating theatre efficiency must be seen in the context of a wider and interdependent system where the upstream and downstream impacts of each part of the patient journey (from preoperative assessment through to discharge) are reviewed holistically. Consequently, any efforts to improve efficiency should involve a number of departments across multiple disciplines to ensure high-quality, cost-effective and safe care.

It is recommended that HHSs establish structured governance teams / committees at both an operational and strategic level, focusing on collaborative and interdisciplinary leadership.

Theatre Scheduling Committee/Team (Operational Management)

Incorporates all aspects of the patient journey, from pre-admission to discharge. Responsible for:

- Day-to-day planning, management and operations of operating theatres at the hospital level
- Review, planning and preparation for theatre lists for the following two weeks
- Review of schedules, surgeon allocations and rostering for the following 6 weeks
- Review and monitoring of all operational indicators and measures (as per section 3.3.2)
- Implementing improvement initiatives
- Escalating any risks and issues to the Strategic Management Committee/Team

It is recommended that this committee meet weekly (or as required)

Theatre Management Committee/Team (Strategic Management)

Incorporates representatives from hospitals within a HHS or hospital network. Responsible for:

- The strategic oversight, management, productivity and efficiency of operating theatres whilst ensuring quality of patient care is not compromised
- Monitoring strategic indicators and measures (as per section 3.3.2) and addressing any performance issues
- Monitoring and managing emergency and non-surgical procedure demand on operating theatres
- Planning and setting the master theatre template and approving any changes to ensure funded capacity is appropriately allocated to align demand and supply
- Reviewing waiting lists against specialty and surgeon allocations within the master theatre template to efficiently service waiting lists
- Planning for closures or periods of reduced activity (e.g. Christmas, public holidays, planned maintenance etc.)
- Risk management and incident reporting
- Policy and protocol development and revision

It is recommended that this committee meet monthly (or as required)

Recommended core and co-opted members are further outlined in Appendix C.

The following principles are important for the effective governance of operating theatres and should be adopted when establishing any teams, committees and/or sub committees:

- Theatre Management teams and committees require strong leadership, appropriate membership and the authority to take action
- Information about theatre performance should be easily accessible and available on a regular basis and should be used to drive change and improvements
- There is clear communication and co-ordination between all craft groups including managers, surgeons, anaesthetists, theatres, preoperative assessment, wards and bed managers

It should be noted that existing governance frameworks and structures, particularly for quality and safety, should be combined with the recommended theatre efficiency governance structure to reduce administrative burden where possible.

3.4.2 Roles, Responsibilities and Accountabilities

In addition to needing overarching management teams/committees to review, monitor and manage theatre performance, the delegation of specific responsibilities to nominated accountable officers is also necessary to ensure the day-to-day running of the operating theatre suite is efficient and effective.

It is recommended that within each hospital, operational theatre management roles are clearly assigned to appropriate, accountable positions within the operating theatre. Delegations may vary across hospitals, though ultimately, responsibilities should be assigned to the most senior officer or appropriate delegate where possible. In smaller regional or rural facilities, some positions may be required to fulfil multiple roles and/or responsibilities.

It is important that accountable officers are aware of their responsibilities and contribution to improving theatre efficiency. The following table outlines the minimum responsibilities that should be assigned for the monitoring and improvement of theatre efficiency:

Head of Operating Theatres - Responsibilities		
Nursing	**Medical - Surgery**	**Medical - Anaesthetics**
• Overall management of budget and resources within the perioperative service • Ensure appropriate nursing workforce availability for the perioperative environment • Review and monitor surgical services in collaboration with relevant stakeholders to achieve performance benchmarks • Foster collaborative teamwork to drive continuous improvement	• Take an active governance role in theatre management to ensure that the surgical care provided is patient centred • Ensure appropriate surgical workforce availability for the perioperative environment • Review and monitor services in collaboration with relevant stakeholders to achieve performance benchmarks	• Take an active governance role in theatre management to ensure the anaesthetic care provided is patient centred • Ensure appropriate anaesthetic workforce availability for the perioperative environment (including pre-admission, theatre, and postoperative care) • Review and monitor services in collaboration with relevant stakeholders to achieve performance benchmarks

• Review and analyse service activity and resource allocations to assist capacity planning for future service provision • Coordinate the capital equipment list and collaborate in the prioritisation and negotiation for equipment • Provide mentorship and support to the professional development of the nursing staff within perioperative services • Actively celebrate successes and encourage high performers • Address root causes of poor performance • Promote quality activities and coordinate quality improvement projects within the department	• Advocate and liaise with hospital administration to ensure services are adequately staffed and equipped to provide a safe, efficient and effective working environment • Ensure that processes and protocols are in place that reflect best practice in the operating theatre environment • Ensure that a professional and respectful work environment is maintained • Provide feedback to all surgical departments regarding perioperative issues of importance • Actively celebrate successes and encourage high performers • Address root causes of poor performance • Ensure audit processes are in place to monitor and assess key quality and safety practices	• Advocate and liaise with hospital administration to ensure services are provided in a safe, efficient and effective working environment • Provide advice and direction regarding issues relating to anaesthesia and sedation governance • Provide feedback to the department of anaesthetics regarding perioperative issues of importance • Actively celebrate successes and encourage high performers • Address root causes of poor performance • Ensure audit processes are in place to monitor and assess key quality and safety practices

Floor / Duty Coordinator - Responsibilities		
Nursing	**Medical - Surgery**	**Medical - Anaesthetics**
• Ensure the daily provision of an appropriate and safe standard of clinical care • Daily coordination of the efficient use of emergency and elective operating sessions in collaboration with the Elective Surgery Coordinator, Anaesthetic Department, Surgeons, and Perioperative Nursing Unit Managers, Bed Managers and ancillary staff • Work collaboratively with multi-disciplinary health care professionals and consumers to effectively and efficiently manage emergency surgery, reduce impacts on elective surgery and maintain a patient centred focus	• Be available on-site and contactable during the working day to assist with providing advice and/or resolving clinical issues • Resolve problems relating to urgent operating room access for acute care patients • Promote “peer to peer” communication and collaboration in time-critical decision making relating to theatre access • Take steps to ensure that potential problems of resource availability can be predicted and resolved in a pre-emptive fashion • Take on a leadership role when there is disagreement amongst craft groups without prejudice	• Be available on-site and contactable during the working day to trouble-shoot issues relating to preoperative preparation, list management and postoperative care • Work collaboratively with the multi-disciplinary health care professionals and consumers to effectively and efficiently manage emergency surgery • Work collaboratively with anaesthetic, nursing and surgery staff to reduce late starts and cancellations on the day of surgery • Ensure that all decisions made are patient centred

• Ensure resources (including staffing) and equipment are allocated effectively and efficiently and are ready and available for all cases each day to minimise delays • Liaise with surgical and anaesthetic leads to resolve issues relating to access to emergency theatre time • Identify and escalate possible late starts and cancellations on the day of surgery via local escalation pathways • Coordinate meal relief to minimise interruptions and delays to theatre lists • Assist in achieving perioperative service and organisational performance benchmarks and elective and emergency surgery KPI's • Provide leadership, mentorship and support to perioperative service staff	• Work collaboratively with surgical, nursing and anaesthetic staff to reduce late starts and cancellations on the day of surgery • Ensure that all decisions made are patient centred • Ensure that the operating environment is being used effectively and efficiently • Ensure that a professional work environment is maintained	• Ensure that the operating environment is being used effectively and efficiently • Ensure that a professional work environment is maintained

Other key roles within the context of managing theatre efficiency:

Role	Responsibilities
Elective Surgery Coordinator / Clinical Care Coordinator	• Proactively monitor waiting lists and theatre supply and escalate demand and capacity issues to operational and strategic management committees to inform theatre template planning and session allocations • Ensure data entry for theatre bookings is consistent and accurate • Monitor and provide expert advice on best practice management of elective surgery waiting lists to ensure treatment within clinically recommended timeframes • Monitor and improve waitlist management measures. E.g. treat in turn and alignment to the NESUCG • Orientate new staff on elective surgery referral and bookings processes • Monitor the booked vs actual indicator to ensure booking practices maximise available theatre time and provide advice to drive improvements • Monitor cancellation rates for failure to attend to ensure booking confirmation processes are effective

Data Manager	• Responsible for the coordination, support, enhancement and ongoing management of data and data sets within the operating room management information system, including inventories for prosthetics and high cost consumables • Produce standard reports for both operational and strategic purposes, including weekly performance reports and reports on data quality, providing information for analysis and publication as required • Actively participate in the development and tracking of performance indicators • Provide education and training to staff to ensure consistency and accuracy in the application of codes, time stamp definitions and data entry • Provide expert advice and support in data management as well as coordinate the dissemination of changes to processes • Coordinate ongoing systems management, development, testing and implementation of changes
Pre-admission Manager	• Coordinate, manage and review pre-admission processes to ensure services are effective in optimising the patients fitness and readiness for surgery • Provide expert advice on best practice standards when reviewing models of care for pre-assessment • Review and monitor cancellations relating to pre-admission processes, for example: unfit due to condition or preparation, no longer requires treatment
Admissions Manager	• Coordinate, manage and review the admission process for patients to ensure effective patient flow where patients are processed and ready for surgery without delay • Review admission times to ensure they enable timely access to theatre • Manage and review delays, ensuring any anticipated delays are communicated to patients to keep them informed about their journey • Monitor cancellation rates for 'patient did not wait' to ensure admissions processes are patient focused and appropriate

3.4.3 Reporting and Monitoring

The following principles should underpin all reporting and monitoring of theatre efficiency:

- Reports should be easily accessible, relatable and easy to understand
- Reports need to provide meaningful information that can be used to drive change
- Reports should be provided in a timely manner that allows sufficient time to review prior to management meetings
- All members of the management committee / team have a responsibility to attend meetings prepared, having pre-read the available reports and actively participate in developing improvement initiatives
- Actions arising from theatre management meetings should be recorded on a register with responsible persons and timeframes assigned and revisited then closed, as required, at future meetings
- Reports and data should be visible and available to staff responsible for and involved in the delivery of services
- Performance issues should be addressed and escalated via the theatre management committees / teams
- Data collections and reports should be generated via a dedicated data manager and custodian to ensure consistency in reporting
- Regular auditing, training and education with staff to ensure accuracy and reliability of data should be undertaken

3.5 Best Practice Standards and Measures of Success

As discussed in section 3.2.1, there are numerous internal and external factors within the perioperative setting that influence the efficiency of operating theatres from planning and scheduling, pre-assessment, through to patient discharge. This section of the guideline is focused on linking the suggested measures and metrics to a range of best practice standards intended to assist HHSs with optimising efficiency across the surgery continuum under the key areas:

- Theatre planning
- List scheduling
- Patient specific requirements and preoperative assessment
- Starting on time
- Changeover time
- Finishing on time
- Minimising delays
- Cancellations

It is acknowledged that sound reasoning may exist for appropriate variation in the application of some of the best practice guidelines in different facilities and Hospital and Health services due to specific circumstances. Where such variation exists, facilities should have clearly documented processes that retain similar principles to those outlined and ensure comparable and reliable data is able to be provided.

Considerations for measures that do not fit specifically within one of these areas e.g. Comparative Theatre Utilisation and cost per weighted activity unit are discussed further in sections 3.5.11 and 3.5.12.

3.5.1 Theatre Planning

The effectiveness of HHSs in delivering efficient surgical services that align supply with demand is dependent on a solid understanding of the capacity of their hospitals, combined with well-established planning processes that ensure maximum utilisation of all resources.

This utilisation of hospital resources constitutes a major contributing factor to the operating costs of a hospital and, as such, poor coordination and planning can result in significant waste and inefficiencies.

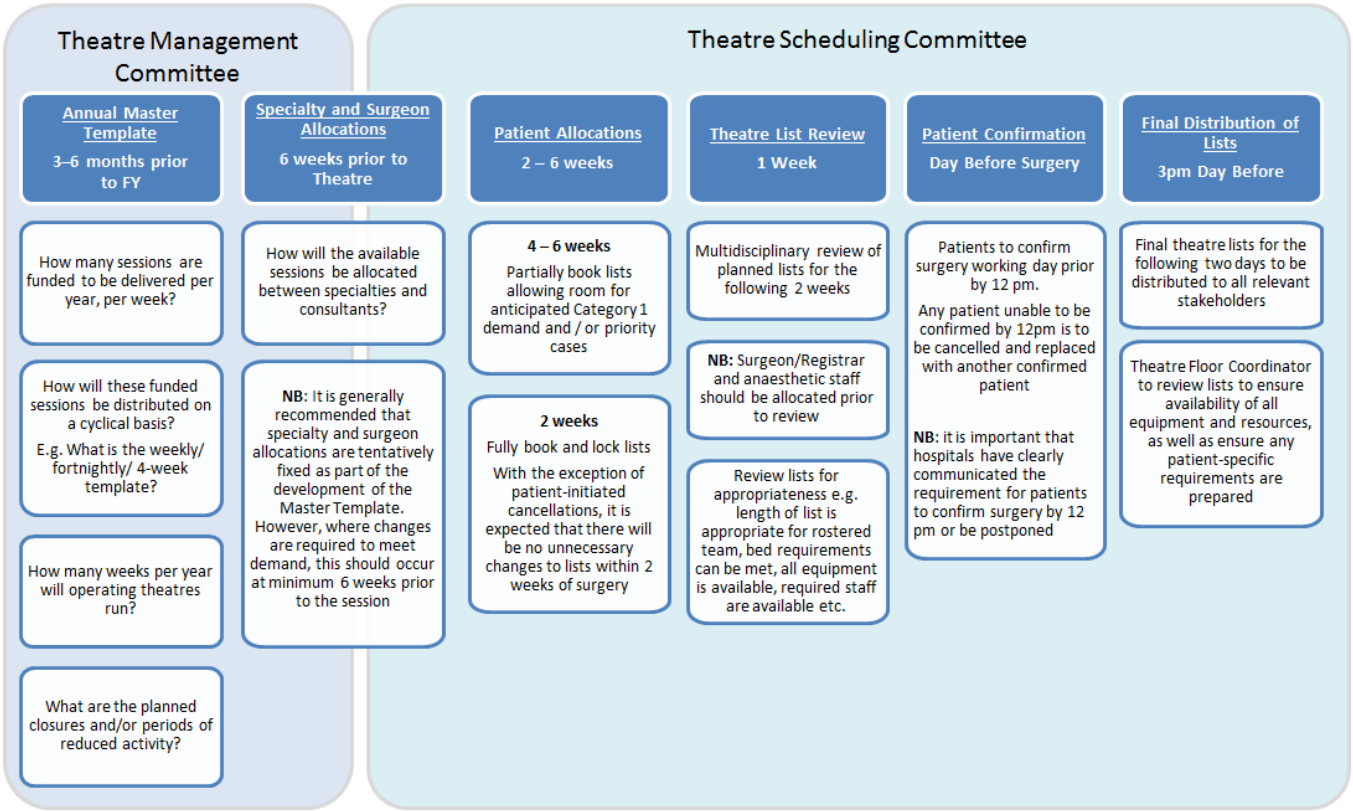
It is necessary that HHSs engage in thorough planning processes that focus on the following key elements:

- Conduct regular reviews and analysis of demand to ensure the appropriate allocation of resources and funded sessions
- An annual (at minimum) review and consolidation of a master template outlining the number of required and funded theatre sessions. The master template may be established on a weekly, fortnightly or other cyclical basis (a common approach is a four weekly template) but in principle should represent the number of sessions a theatre is funded to run on a routine basis

- Agreement on planned closures for each year to determine how many weeks of the year theatres are planned to operate
- Robust planning and coordination processes that enable flexibility between the allocation of theatre sessions such that elective, trauma and emergency theatre time allocation is responsive to changing demand and case mix at specialty and consultant level
- Scheduling and booking processes that enable early identification of a misalignment between demand and capacity so that this can be addressed through the reallocation of sessions as required
- Communication processes that ensure key stakeholders have access to planning documentation and are notified of changes as they arise, from the Master Template through to daily theatre lists

The following timeline represents a sound approach to planning elective surgery to support the delivery of the above:

Figure 3 Elective Surgery Planning



Hospitals without dedicated emergency theatres and those smaller hospitals reliant on a Visiting Medical Officer (VMO) workforce may consider revising the above timeframes based on specific service requirements. For example, hospitals without emergency theatres may elect to partially book lists greater than 2 weeks and adopt a 'standby patient' strategy to fill lists where there is a lack of emergency demand.

In addition to the above, it is also important that strong governance over leave management, template and/or list changes is established via means of:

- Business rules regarding leave approval with a minimum 6 weeks' notice for all staff
- Local escalation policy for approving cancellations on the day of surgery
- Centrally located master theatre template, weekly timetable and draft daily theatre lists for access by all relevant staff
- A dedicated custodian of the Master Theatre templates responsible for the coordination and approval of changes. It is recommended that the Elective Surgery Coordinator (or equivalent) undertakes this function to maintain oversight of waiting list demand and supply in liaison with the Theatre Management committees / teams
- Clear policies and procedures for reallocating and/or cancelling or changing lists and disseminating information to all stakeholders. It is recommended that:
  - Requests for permanent / semi-permanent changes to the Master Template are made and endorsed via the Theatre Management committee / team
  - Requests for ad-hoc changes to session allocations are made and approved via the Theatre Scheduling committee / team
  - Requests for changes to theatre lists within 2 weeks should be escalated via the Theatre Scheduling committee / team (or delegate as per local policy)
  - Requests for changes to theatre lists within 1 week should be escalated via the Theatre Scheduling committee, or if insufficient time, to Specialty Director (or delegate as per local policy)
  - Requests for changes to theatre lists within 48 hours should be escalated to the Head of Theatre and Theatre Floor Coordinator (or delegate as per local policy)

Hospital and Health Services should also give careful consideration to the planning and management of emergency surgery and non-surgical procedures so that demand for such activity is appropriately accommodated to reduce impacts on elective sessions. Provisions for these services will be dependent on individual hospital demand, workforce and resources. HHSs should adopt the principles outlined in the Queensland Health Emergency Surgery Access Guideline for the management of emergency surgery.

Measure(s) of Success		
Measure	**Use and Considerations**	**Qualitative Assessment**
Unplanned Session Closures	• To be reviewed in conjunction with comparative elective theatre utilisation as a session may be occupied however poorly utilised. For example: Unplanned session closures may be 0% (i.e. every planned session has had 1 or more patients treated) however utilisation is only 20% overall, thus broadly inefficient • An all-day session is reported as one session, hence it is recommended that HHSs report on unplanned closures by session type	• What protocols are in place to ensure vacant sessions within the template are covered and used? • Are planned closures communicated to key stakeholders in a timely manner? • Are session closures being appropriately recorded in the operating theatre management system?
Emergency Theatre Occupancy	• To be reviewed in conjunction with other emergency surgery measures for a balanced perspective • Primarily to be used to inform the need for increasing or decreasing planned emergency sessions • This measure does not enable delineation between low utilisation due to no emergency demand and low utilisation due to inefficiencies and should be considered in conjunction with out-of-session emergency activity • Occupancy may be generally lower due to emergency cases being of typically higher acuity and complexity which may also increase changeover times and delays	• Is the majority of the emergency caseload being performed in session? • What proportion of emergency surgery workload is Orthopaedics? If > 50% has consideration been given to a dedicated orthopaedic emergency theatre? (As per the Emergency Surgery Access Guideline)
Emergency Cases in Elective Sessions	• This measure may be used when considering demand for emergency surgery and the need for new / additional dedicated emergency or trauma sessions	• What are the main specialties occupying elective sessions for emergency workload? • If >30% for Orthopaedics, has consideration been given to a dedicated orthopaedic theatre (As per the Emergency Surgery Access Guideline)

Out of Session Emergency Case Time	• It is recommended that a review of the categorisation and breach times of emergency patients treated out of session is monitored to identify if cases are being performed out of session as a result of true demand or because there has been insufficient capacity to provide surgery in-session	• Are emergency cases being managed in accordance with the Emergency Surgery Access Guideline? • Are any Category C - E emergency cases treated out of session? • If ≥ 30% of emergency cases run over 2200hrs, has consideration been given to a dedicated emergency theatre? (as per the Emergency Surgery Access Guideline)
Total Patients Treated	• A productivity measure to monitor overall throughput • It is recommended that HHSs monitor this on a monthly basis and at a specialty level • Variation in total patients treated may be the result of a range of factors which should be considered, including: - Change in the number of operating sessions undertaken - Improvements or decline in efficiency performance - Case mix and acuity of patients	• Are variations in caseload the result of known and planned changes in activity or is it the result of unexpected events? • Has there been any significant change in cancellation rates, patient acuity and/or other efficiency measures that may have contributed to an increase or decrease in throughout and supply?
Net Additions to waiting list	• Best reviewed at a specialty level • A positive value should result in a growth in the waiting list (i.e. more patients added than removed) • A negative value should result in a reduction in the waiting list (i.e. more patients removed than added) • A consistently positive or negative value may indicate the need for a review and realignment of session allocations between specialties • When using this data for sustainability reviews, careful consideration to removals as a result of outsourcing must be accounted for, particularly if outsourcing is not anticipated to form future core business	• Has there been a change in demand (additions to the waiting list) and why? • Is this due to an increase in outpatient activity? • Has there been a change in removal rates and are patients being appropriately referred for surgery? • Has there been a change in the number of patients treated and why? • Are there any short to mid-term significant trends that may require a review of session allocations? • Are there any long term significant trends that may require a review of the master theatre template?

3.5.2 List Scheduling

Principles

Effective theatre scheduling is fundamental to optimising the use of available theatre time and increasing throughput with the main aspects of scheduling falling into one of three phases:

1. Theatre List Planning
2. Theatre List Bookings
3. Ordering Theatre Lists

1) Theatre List Planning:

It is recommended that, where possible:

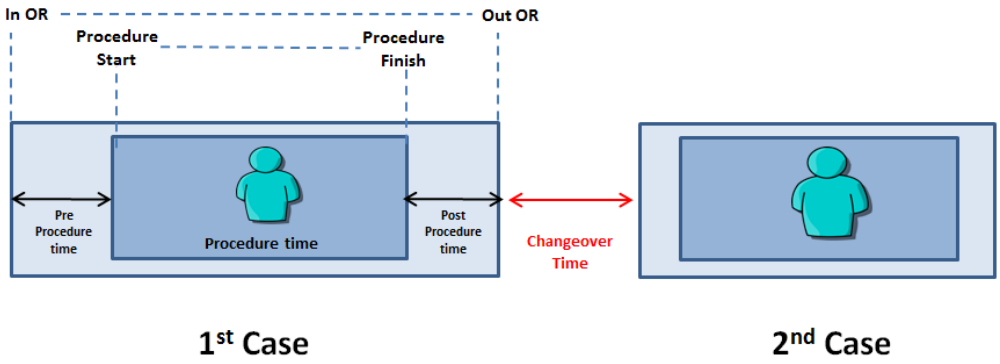
- Same surgeon, all-day lists should be maximised as opposed to split morning and afternoon sessions
- Where same surgeon, all-day lists are not possible, same specialty, all day lists should be prioritised
- Meal relief should be rostered to enable continuity and flow to maximise utilisation and productivity. Where meal relief is not rostered, the following should be considered in the context of reporting on efficiency:
    - Average Changeover time: For all-day lists, Comparative Theatre Utilisation will not be affected, however average changeover time will be protracted due to vacant In OR time during the meal break period
    - Comparative Theatre Utilisation: Where split sessions (morning and afternoon) are rostered, early finishes and overruns in the morning session and late starts for an afternoon session will negatively impact Comparative Theatre Utilisation

2) Theatre List Bookings:

The ultimate goal for booking lists is to consistently align planned utilisation to actual utilisation. Accurate and reliable booking processes can significantly improve finishing on time by not under-booking or over-booking lists and reducing cancellations on the day of surgery as a result of insufficient theatre time.

It is fundamental that hospitals have a good understanding of anaesthetic time (pre and post procedure), procedure time and changeover time to ensure effectiveness of bookings. The following diagram represents the stages of intraoperative time that should be considered when allocating bookings:

Figure 4 **Intraoperative time considerations for scheduling cases**



Whilst optimally the pre and post procedure times in OR will be minimal, hospitals should review and consider the time occupied by these phases when estimating overall case times.

There are various factors which can influence the duration of the pre and post procedure times within the OR including the type of surgery (e.g. Caesarean sections requiring a TAP block post procedure will require increased time from Procedure finish to Out OR) and whether or not an anaesthetic room and staff are available.

If an anaesthetic room and staff are available to permit the commencement of anaesthetic care of one patient before the completion of anaesthetic care of another patient for the same operating theatre, then the pre procedure time within the OR is going to be considerably less than those where anaesthetic preparation is required In OR. It should also be noted that hospitals undertaking parallel processing of patients may report an inflated pre-procedure anaesthetic time, hence review of this average time should only be measured using the first case of an elective morning or all day session.

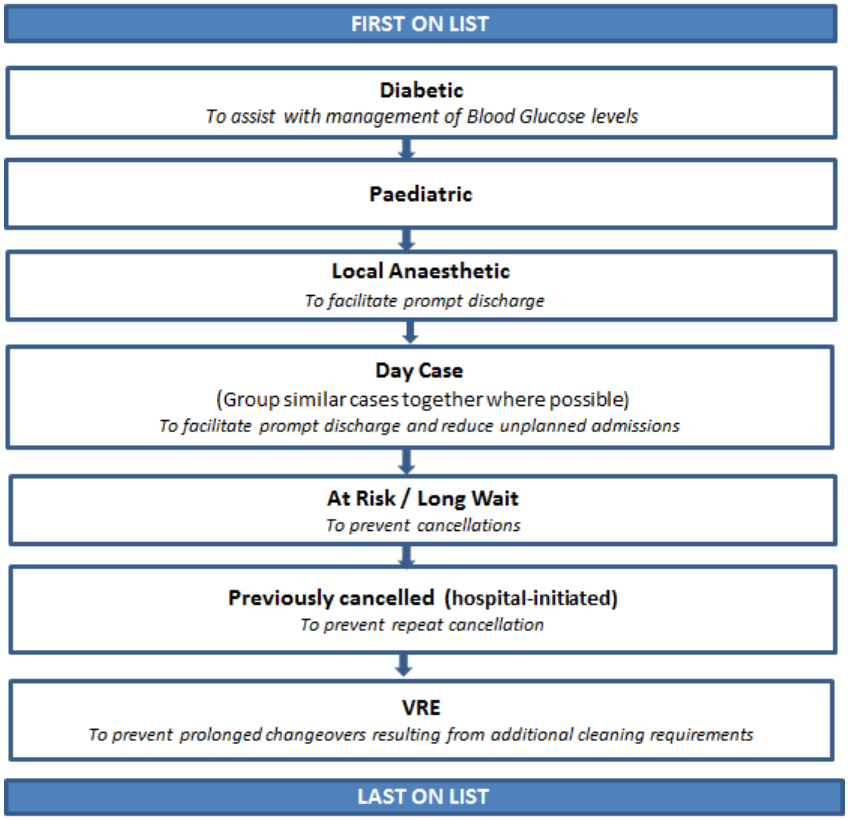
The following is recommended for booking and estimating case times to plan theatre lists:

- HHS's should establish clear procedures for compiling theatre lists including key role responsibilities (surgeon/anaesthetist, theatre, booking office etc.), how information should be communicated to key areas, timeframes for distribution and processes for notifying of changes
- Estimated Case Time = Average Procedure Time + Average Changeover time noting the following considerations:
  - Individual consideration regarding pre and post procedure time (typically relevant to anaesthetic time in the OR) should be applied when estimating total case time
  - The average procedure time used should be as per the theatre management system's generated average procedure time based on applicable procedure codes (measured from 'Procedure Start' to 'Procedure Finish'), unless indicated otherwise by the treating surgeon on the booking form
  - The benchmark for average changeover time is 15 minutes however, when applying this measure, consideration should be given to case mix, availability of an anaesthetic room and the impact of emergency surgery performed in elective lists
  - Patients requiring complex anaesthetic and / or other preparation (e.g. BMI > 40) should be allocated additional time. This information needs to be communicated to the Booking Office at time of referral to the waiting list and / or immediately following pre-anaesthetic assessment

3) Ordering Theatre Lists:

Appropriate ordering of a theatre list can reduce intraoperative delays and contribute to improved changeover times, patient flow and bed access. Notwithstanding individual patient needs, clinical discretion or hospital specific arrangements, the following principles for the ordering of patients on a list are recommended:

Figure 5 List Order Priorities



Other Considerations for ordering of lists:

- Day of surgery admissions should avoid being booked as the first case on a morning list to allow time for discharges and confirmation of bed availability
- Extended day of surgery (23 hour ward patients) should be booked later on the list to minimise bed occupancy
- A patient's place of residence should be considered, particularly for rural patients e.g. rural patients to be mid-morning to enable sufficient time to arrive and return home within daylight hours
- Patients requiring certain pathology should be booked to allow sufficient time for the transportation of specimens for timely processing
- ICU bed availability

- Availability of support services (e.g. medical imaging interpreter services, renal dialysis)
- Equipment, prosthetic and product representative availability
- Individual patient requirements (e.g. mental health, security, special needs)
- Patient allergies (e.g. Latex)

In line with the recommended planning and review timeline as per section 3.5.1, the final list order should undergo clinical consultation.

Measure(s) of Success		
Measure	Use and Considerations	Qualitative Assessment
Average Elective Pre-Procedure Anaesthetic Care Time	• To be used for planning and rostering purposes to enable starting on time • HHSs may elect to develop reports that drill down to specialty, procedural and / or consultant level as required • Average times may include delays between 'In Anaesthetic' to 'Procedure Start' which may not necessarily be related to anaesthetic inefficiencies • HHSs that commence anaesthetic outside the OR must ensure robust processes are in place to communicate and record the accurate 'In Anaesthetic' time as this may not be visible to the staff in the OR who are responsible for the data entry	• How is this measure being used to inform bookings practices and estimated case times? • What processes are in place to regularly review Pre-Procedure Anaesthetic Care Time to better align booked versus actual utilisation • For hospitals commencing anaesthetic outside the OR, what is the process for communicating and recording accurate 'In Anaesthetic' time?
Average Changeover Time	• Used to inform bookings processes to enable a more accurate estimate of changeover times • Case mix should be considered when comparing average changeover times as more complex cases may require longer set-up and anaesthetic preparation thus increasing changeover time • Where patients are treated in a different theatre to that which they were booked, despite being treated by the same team, the time for that case will be reflected as an extended changeover for that session	• How is this measure being used to inform bookings practices and list scheduling? • What processes are in place to regularly review changeover times to inform booking and scheduling practices? • How are meal breaks rostered and is this contributing to reportable protracted changeover times?

	• Hospitals running all day lists without meal relief need to consider that average changeover times will be impacted as the time taken for meal breaks will be reflected as changeover time • Changeover time will typically be higher where emergency cases are completed in elective sessions, hence this indicator should also be considered against the indicator for emergency cases in elective sessions • It is recommended that hospitals report on this measure with the option to drill down to specialty / sub-specialty level and / or consultant level as required	
Booked versus Actual Time	• Regular and significant variation between booked utilisation and actual utilisation may indicate the need for a review of booking and scheduling processes to ensure estimated times are aligned with actual operating times. However, this needs to be considered holistically to ensure bookings practices are not changed to accommodate inefficient practices • Reliability of this measure is dependent on the accurate data entry of estimated case times. Booking systems that use a points and / or other non-time specific process may not accurately record planned utilisation unless estimated times are updated in the system • Data on total booked elective minutes should be snapshotted no earlier than close of business the day prior but before any day of surgery cancellations	• Are 'underrun' lists the result of cancellations on the day of surgery or the result of an under-booked list? • Are 'overrun' lists the result of late starts, delays and/or protracted changeovers or due to over-booked lists? • How is this report used to inform booking and scheduling practices?
Elective Cancellations on Day of Surgery	• It is recommended that HHSs report on cancellations by cancellation reason code to review the proportion of hospital and patient initiated cancellations as well as preventable cancellations	• Is the hospital's admission times protocol appropriate and reasonable in terms of patient waiting times? • What is the hospital's policy / procedure on elective surgery bed quotas?

	• Cancellation reasons relevant to list scheduling may include: • Patient did not wait • No beds • No ICU beds • No operating theatre time • Equipment unavailable	• Does the quota on bed bookings consider seasonal trends? • What is the escalation and management procedure for anticipated list overruns? • How are lists reviewed and ordered to ensure availability of equipment/ prosthesis/ resources?

3.5.3 Reducing Variation – 'Green Lists' / 'Service Lists'

One approach to list planning and scheduling which HHS's may consider is that of 'Service Lists' or 'Green Lists.' Whilst not practical for all sessions and hospitals, the purpose of these models is to increase efficiency and productivity by reducing variation.

Background:

The Green List is a model adopted in the National Health Service (NHS), United Kingdom and aims at increasing predictability and streamlining based on the concept of repetition and use of 'Lean Thinking' principles. The 'Service List' model forms part of the 'The Productive Operating Theatre' (TPOT) program and is based on the 'Green List' model, with the primary focus of using consistent teams for dedicated non-training lists.

Whilst training and education of staff is recognised as being fundamental to the delivery of sustainable, safe and quality services, these models offer opportunities to consolidate efficient processes and maximise patient throughput. Furthermore, Green lists may be used to offset any increased requirements for training so that overall supply is maintained.

Principles:

- Increase efficiency and productivity within existing resources
- Consistent teams, case mix, equipment, and session times will cultivate familiarity to increase knowledge and speed
- Appropriate patient selection and preoperative assessment are pivotal for the effectiveness and safety of these lists
- Regular review of lists is fundamental to improving future processes and developing sustainable, efficient practices

List Characteristics:

- Same number and type of cases
- Agreed anaesthetic and surgery times
- Start, finish and break times are agreed in advance
- Consistent theatre team (surgeon, anaesthetist, theatre nurses etc.)
- No (or very minimal) opportunities for training
- Lists are planned and confirmed well in advance (3 weeks)
- Selected patients have undergone necessary preoperative and pre-anaesthetic preparation
- List order is set prior to day of surgery and is not changed
- All patients are admitted on the day of surgery
- A team debrief is undertaken at the end of each list to reflect and report any issues to the theatre management committee for further review
- Equipment is readily available for high turnover lists

3.5.4 Patient-Specific Requirements and Preoperative Assessment

The smooth and effective running of a theatre on the day of surgery is significantly enhanced through thorough planning and preparation of both the operating theatre and the patient.

As such, a preoperative assessment of the patient should be undertaken that: establishes that the patient is fully informed and wishes to undergo the procedure; supports optimising the patient's fitness for the surgery and anaesthetic; and minimises the risk of late cancellations by ensuring that all essential resources and discharge requirements are identified in advance.

It is recommended that HHSs:

- Ensure appropriate pre-anaesthetic and preoperative assessment processes are in place that adequately prepare patients for surgery and identify any resource and / or discharge requirements in advance
- Have clear processes for the documentation and communication of specific preoperative information to booking officers and theatre

As per Queensland Health's Elective Surgery Implementation Standard, preadmission assessment should be completed at least six weeks in advance of the expected date of surgery for category 2 and 3 patients, and at least seven days prior to surgery for category 1 patients.

The preoperative assessment service offered by hospitals should be dependent on the type of surgery and the clinical needs of the patient. For example, regional or rural hospitals may choose to offer preadmission services using telehealth, while some patients may be eligible for nurse-led pre-admission assessments.

Some models of preoperative assessments are multidisciplinary and include pharmacists and other allied health professionals.

Measure(s) of Success		
Measure	Use and Considerations	Qualitative Assessment
Elective Cancellations on Day of Surgery	• Cancellation reasons relevant to preoperative assessment and work-up may include: - Patient cancelled booking - Unfit due to condition - Unfit due to preparation - Failed to attend day of surgery - No longer requires treatment - Patient requested to be removed - Treated elsewhere	• What is the hospital's process for confirming surgery to prevent last-minute cancellations and is it effective? • Is the pre-op education material and information provided to patients adequate and appropriate for preparing patients for surgery? • Does the hospital have a robust and effective auditing process to ensure patient details and waiting lists remain up-to-date?

3.5.5 Starting on Time

One of the key contributors to improving theatre efficiency is starting on time. Starting a list on time and as planned will ensure the greatest opportunity to finish on time (and thus minimise overtime costs), avoid unnecessary cancellations and maximise the use of available theatre time to increase productivity.

An on-time start is measured by the difference between the session start time and first case In OR time, such that the first patient enters the OR either before or on the scheduled session start time.

There are a number of factors which can contribute to a list starting late including:

- Patient arriving late or not prepared (e.g. incorrect fasting)
- Patient not prepared by the hospital in time (e.g. due to orderly being unavailable, ward failing to have patient ready for transfer, bottleneck in admissions)
- Change to list order on the day of surgery
- Incomplete documentation (e.g. consent)
- Equipment / theatre unavailable
- Staff unavailable / late
- Unexpected complex anaesthetic preparation
- Previous list over running (for afternoon sessions)
- Emergency / priority cases
- Delayed anaesthetic assessment on admission

The following recommendations are intended to increase the likelihood of lists starting on time.

HHSs should ensure they have:

- Implemented reliable confirmation processes for patients at least the day before surgery to confirm admission details including time, location (where to go), what to bring and fasting instructions
- Communicated and displayed clearly defined timeframes for staff relating to key stages of the patient journey from patient arrival to In OR
- Standardised day of surgery admission processes to maximise patient flow including:
  - Clearly defined protocols for allocating admission times for patients (e.g. minimum 90 minutes prior to planned In OR time)
  - Use of staggered admission times to prevent bottlenecks and delays
  - A single point of admission
  - Pre-assembled and pre-prepared paperwork
  - Processes for the early identification of eligible day of surgery and extended day of surgery patients
  - Processes for flagging and communicating details of patients requiring longer anaesthetic preparation (including anaesthetic assessment on admission) and arrangements made to commence preparations early, which may also require the review of rosters for all professional streams to enable the first case to start on time

- Clear escalation pathways for proactively flagging potential late starts (further details regarding roles and responsibilities are outlined in Section 3.4.2)
- Processes in place for Theatre Managers to review lists the afternoon prior to ensure all necessary equipment and resources will be available and ready to commence cases on-time
- Readily accessible, up-to-date theatre lists for all relevant stakeholders (including consultant and junior surgical staff, anaesthetic staff, nursing staff and support services)
- Processes for recording all late starts in the operating theatre management system, with the appropriate delay reason code entered

Measure(s) of Success		
Measure	Use and Considerations	Qualitative Assessment
Starting on Time	• It is recommended that hospitals report on this measure by session type (morning, afternoon and all day sessions) to understand the impacts that morning overruns have on afternoon on-time starts • If morning sessions regularly overrun, the starting on time result will continue to be negatively impacted as this will delay the start of afternoon sessions scheduled for the same theatre • For this metric to be most useful, HHSs should focus on establishing processes and systems to ensure the reasons for delays are consistently recorded which will ensure trends and root causes can be identified and targeted • To be reviewed alongside average late starts and delay reasons to determine the extent by which lists are starting late and what actions may be required to address	• Are admission times appropriate so that there is sufficient time to prepare the patient for an on-time start? • Are there trends across certain specialties? • Are there rostering issues such that other commitments are preventing availability of staff to start on time (e.g. ward rounds, clinics running late)? • What is the hospital's process for flagging and communicating difficult patients who require complex anaesthetic preparation or positioning? • What is the hospital's process for confirming patient's admission, fasting and preparation details to ensure they arrive on-time and prepared? • Are staff routinely recording reasons for late starts to enable identification of root causes and trends?
Average Late Start Minutes	• To be reviewed alongside the starting on time and elective delays metric to understand the frequency of late starts and reasons for delays to first cases	• Are rosters suitably aligned to enable the required preoperative duties to be safely undertaken prior to the required session start time?

3.5.6 Changeover

Changeover, or turnover, time refers to the time from when one patient exits the OR to the next patient entering the OR within the same session. This time is necessary for cleaning the theatre, removing unsterilised equipment and replacing with clean equipment. An efficient changeover is within the control of a hospital and is reliant on staff being available, equipment being ready and the next patient being appropriately prepared.

Changeover time is dependent on a number of factors including:

- Infrastructure and layout of the theatre environment (e.g. access to equipment, distance between holding bay to operating theatre)
- Capability for parallel processing
- Communication processes (e.g. push / pull approach to notify next case ready to enter or exit OR)
- Emergency cases in elective sessions
- Case mix and / or anaesthetic complexity

Furthermore, delays during changeover can be the result of a number of factors including:

- The next patient not being ready for surgery
- Anaesthetic staff accompanying the previous patient to recovery and therefore being unable to commence work on the next patient
- Consent or anaesthetic assessment on admission
- Theatre staff requiring breaks
- A full recovery ward
- Waiting for availability of an orderly to collect a patient from theatre

To reduce the time taken between cases, it is recommended that HHSs, where possible:

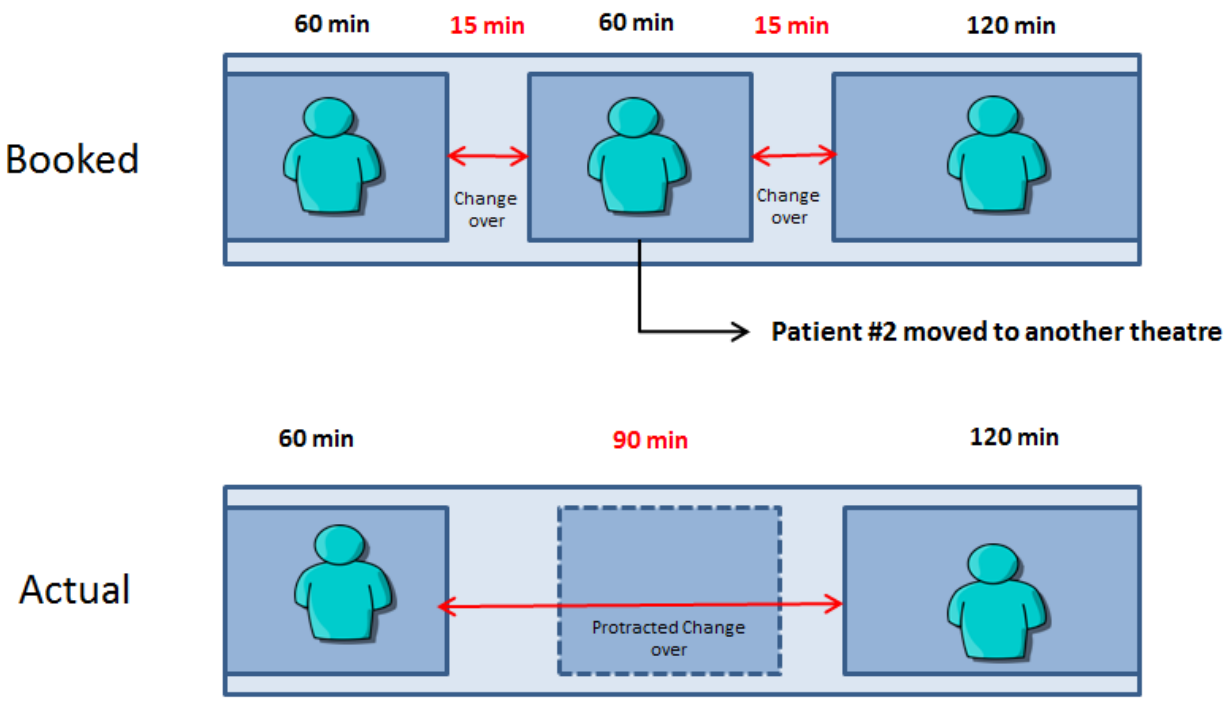
- Review the theatre layout, environment and storage through the use of methodologies and programs such as LEAN Thinking or TPOT (for example)
- Utilise parallel processing
- Clearly define communication protocols between admissions, orderlies, theatres, recovery and wards to alert staff of incoming and outgoing patient flows
- Schedule similar / same cases consecutively to reduce the time required for equipment changeover e.g. book laparoscopic cases together
- Ensure high turnover lists with cases requiring the same equipment are booked to enable sufficient time for sterilisation and reprocessing without delay e.g. avoid booking an all-day endoscopy list with all colonoscopy cases where there is insufficient equipment to complete the list without a delay for sterilising
- Record all protracted changeover times in the operating room management information system as a delay to allow hospitals to understand the reasons for delays and thus make improvements

Where hospitals don't have access to dedicated emergency sessions, average changeover times may be increased due to the unplanned nature of emergency cases which may interrupt and delay elective lists. Generally, changeover times between emergency cases will be significantly longer than that of elective cases.

When reviewing average changeover time for booking and estimation purposes, consideration also needs to be given to case mix and may be beneficial to review at a specialty and / or sub-specialty level given the variation that will exist.

Additionally, where patients are treated in a different theatre to that which they were booked, despite being treated by the same team, the time for that case will be reflected as an extended changeover for that session. The below diagram highlights this situation further:

Figure 6 Protracted changeover time example



Measure(s) of Success		
Measure	Use and Considerations	Qualitative Assessment
Average Changeover Time	• Used to inform bookings processes to enable a more accurate booking estimate • Case mix should be considered when comparing average changeover times as more complex cases may require longer set-up and anaesthetic preparation • Where patients are treated in a different theatre to that which they were booked, despite being treated by the same team, the time for that case will be reflected as an extended changeover for that session • Average changeover time for hospitals running all day lists without meal relief will be impacted as the time taken for meal breaks will reflect as changeover time • Changeover time will typically be higher where emergency cases are completed in elective sessions • Hospitals without anaesthetic bays may wish to target a shorter average turnover time, given that anaesthetic duties will be completed inside the operating theatre • It is recommended that hospitals report on this measure with the option to drill down to specialty / sub-specialty level and / or consultant level as required	• Are patient bookings being allocated to the most appropriate theatre? • How are meal breaks managed and recorded? • Is the physical layout of the theatre conducive to minimising changeover times? • Are protracted changeover times clinically justifiable due to complex anaesthetics being undertaken outside of the operating theatre?
Emergency Cases in Elective Sessions	• In the context of changeover times, this should be considered as the changeover time for emergency cases is generally longer than that for electives • Where demand for emergency surgery is frequently occupying elective sessions, a review of emergency session allocations may be necessary as part of a review of the master theatre template	• Is notification of emergency cases communicated to the Floor Coordinator in a timely manner? • Are emergency cases entered onto the emergency board immediately to ensure decision makers have up-to-date information to optimise theatre access and use? • What is the process for notifying of any specific equipment or resource requirements for emergency cases?

3.5.7 Finishing on Time

Finishing late (or early) can be the result of a range of factors including poor planning, unnecessary delays, inefficiencies on the day of surgery, cancellations on the day of surgery, surgical and anaesthetic complications and / or a misalignment between booking processes and actual operating time (e.g. overbooked or under-booked lists).

Late finishes not only increase the likelihood of cancellations on the day of surgery but are also costly (due to staff overtime) and contribute to staff dissatisfaction, particularly if occurring on a regular basis. Similarly, early finishes are also costly due to the potential for wasted time which has been staffed and resourced and could have been used to complete another case.

HHSs should adopt a balanced approach to managing overruns and underruns to ensure unnecessary cancellations and poor utilisation is minimised. The benefit of running overtime versus finishing early should be reasonably considered and a flexible approach adopted where either overruns and / or underruns are not occurring on a routine basis.

To support this, it is recommended that:

- HHSs implement a clear procedure for the escalation and approval of overruns and cancellations on the day of surgery. The focus should be on proactively identifying potential overruns or cancellations early to enable a timely, balanced and well-informed decision to be made
- When implementing an escalation procedure, the following factors should be considered when making decisions regarding overruns and cancellations:
  - Clinical urgency of the patient and / or whether the cancellation will result in a breach of clinically recommended waiting times
  - The patient's demographics and place of residence
  - Any previous hospital-initiated cancellations of the patient
  - Staff availability and willingness to work late and for how long
  - Budget constraints in terms of overtime expenditure
  - Other individual patient considerations
- HHSs should endeavour to routinely monitor overruns and underruns through a considered approach to the range of metrics described earlier in the guideline so that any root causes can be identified and managed
- HHS's have a process for early identification of training and education sessions (e.g. Registrar led lists) to ensure they are booked appropriately and run to schedule to minimise late finishes
- HHS's consider the use of standby patients for high-cancellation lists to enable last minute cancellations to be replaced to reduce early finishes (more information below)

3.5.8 Standby Lists / Patients

The purpose of standby lists and standby patients is to allow hospitals to fill vacancies on theatre lists at short notice as a result of last minute cancellations. This may be within 24 hours where appropriate.

Principles:

- Patients have agreed to be contacted at short notice and confirmed their availability
- Patients have agreed to the maximum timeframe within which they can be available at short notice (e.g. within 24 hours, 48 hours, 72 hours)
- Patients have undergone necessary pre-op assessment and are suitable to be standby patients
- Selected patients do not require any specific equipment or preparation that would preclude surgery being undertaken at short notice
- Depending on timeframe to surgery, typically only minor, day-case patients are suitable
- Where a patient declines an offer of surgery for a standby booking, it should not be counted as a cancellation / decline of an offer of surgery under the elective surgery implementation standard's 'two-strike' guideline
- Clear processes are in place to communicate last minute changes to theatre lists to all relevant stakeholders including surgeon, anaesthetist and theatre

Measure(s) of Success		
Measure	Use and Considerations	Qualitative Assessment
Finishing On Time – Overruns (Late Finishes)	• Overruns can be the result of a range of factors as below and thus this measure should be reviewed alongside other associated metrics: - Emergency cases treated in elective sessions - Late starts - Delays and prolonged changeover times - Lists not booked appropriately (overbooked) • If using this metric in the context of overtime, note that this also includes morning sessions which finish late • It is recommended that hospitals report on this measure by session type (morning, afternoon and all day sessions)	• What is the hospital's policy and escalation procedure for anticipated overruns? • Is sufficient time being allowed for cases / lists used for education and training? • How is notification of cases / lists requiring additional time for education and training communicated to bookings? • Are there any trends for lists running overtime – either related to specialty, staffing, session, theatre, day of week that could be further explored if the root cause is unknown? • Is sufficient time being allowed for changeovers?
Finishing On Time – Underruns (Early Finishes)	• Underruns should be reviewed alongside other associated metrics as they can be the result of a range of factors as below: - Lack of demand to fill sessions, including insufficient short cases for gap-fillers - Cancellations on the day of surgery / within 24 hours - Lists not booked appropriately (underbooked) - Early starts • Depending on the frequency, HHSs may elect to review early finishes alongside early starts to determine if session times are aligned to activity and rosters	• What is the hospital's process for standby patients to ensure last minute cancellations can be replaced? • Where demand is insufficient to fill an available session, what options are available to ensure this time is used? E.g. could another surgeon or specialty use this time? • Is the allowed changeover time between cases appropriate? • What is the hospital's policy and procedure for cancellations on the day of surgery and does it promote a reasonable approach to decision making regarding whether to overrun or cancel and underrun?

	• Dependent on case mix, HHSs may elect to monitor this metric against a different threshold (e.g. 30 minutes or 60 minutes) based on what is reasonable in terms of impacts on throughput e.g. an endoscopy list may elect to monitor against a 30 minute threshold as another case could be booked which is operationally meaningful.	

3.5.9 Minimising Delays

Delays can occur during each stage of the perioperative pathway and can be the result of patient and / or hospital related reasons. Delays contribute to poor utilisation by resulting in late starts, prolonged changeovers, late finishes, bottlenecks in patient flow and day of surgery cancellations.

Reasons for delays in various stages of the perioperative pathway can include:

- Priority emergency cases
- Equipment failure
- Equipment / prosthetics / organ unavailable
- Inappropriate booking / failure to notify regarding special requirements
- Changes to list order on the day of surgery
- Staff unavailable (surgeon, anaesthetist, nursing, recovery, orderly, support services)
- Staff arriving late
- Awaiting pathology results
- Incomplete documentation (e.g. consent)
- Prior case ran over
- Patient arrived late
- Patient not ready for transport (to / from ward, trolley availability, lift delay)
- Patient's condition requires further preparation
- Radiology delays / unavailability
- Recovery full and unable to accept patients
- Staff training, resulting in extensive case time
- Set-up and sterilisation delays
- Disaster Plan activity e.g. Fire alarm activation

Recommendations described in previous sections of the guideline relating to theatre planning, starting on time, changeover time and finishing on time are all consistent with minimising delays.

However, one of the main challenges with managing delays is access to reliable data as a result of limited and inconsistent data entry. This is typically because staff working in theatre may be unaware that there has been a delay, are unsure of the root cause of the delay and / or are unaware of the need to record the delay reasons. Thus, it is recommended that HHSs:

- Educate theatre staff to ensure delay reasons for all delays (and not just late starts) are routinely recorded by entry into the operating room management system
- Monitor and audit delays to ensure the application of delay codes is consistent and accurate and the use of free-text reasons is minimised

Measure(s) of Success		
Measure	Use and Considerations	Qualitative Assessment
Elective Delay Minutes	• The effectiveness of this measure is dependent on consistent and accurate data entry when there are delays. Depending on system limitations, this may require staff to manually identify and record all delays where auto-prompts are not available • It is recommended that all delays be assigned a delay reason code rather than the use of free text to enable aggregate reporting • It is recommended that HHSs report on delays by delay reason, time of day and day of week to assist with identifying root causes	• How is the hospital ensuring delay reasons are routinely identified and recorded? • Are there any noticeable trends in time such as time of day and / or day of week that may reflect a wider issue? • Are delays primarily the result of late starts or protracted time between cases (changeover time)
Average Recovery Delay between Ready for Discharge to Discharge	• Patient flow indicator to ensure bed blocks in recovery are not delaying theatres • Hospitals should ensure appropriate recovery delay reason codes are entered to enable identification of root causes for delays	• Are bottlenecks in recovery causing delays for the next patient to access theatre? • What is the procedure for escalating and managing bed block in Recovery? • Is the rostering of orderly staff aligned to peak periods of activity?

3.5.10 Cancellations

Reducing cancellation rates on the day of surgery will assist with minimising lists that finish early and therefore reduce wasted time in the operating theatre. Cancellations can be the result of patient and / or hospital initiated reasons, a number of which may be avoided through good practice.

Understanding the reasons for cancellations is important as they can either be an indicator of inefficiencies or contribute to inefficiencies.

Reducing hospital-initiated cancellations is also vital for ensuring a positive patient experience as last-minute cancellations can be inconvenient, distressing and costly.

Common cancellation reasons and strategies for minimising cancellation rates include:

Patient Initiated Cancellation Reason	Preventative Strategies
Patient cancelled booking	• Confirmation processes including on the day before surgery
Unfit due to condition	• Relevant pre-admission education to optimise condition prior to surgery • Education regarding the need to contact the hospital if change in condition so that cancellations can be replaced • Appropriate pre-assessment and triage to ensure readiness and suitability for surgery
Unfit due to patient's preparation	• Confirmation process day before surgery reinforcing admission and fasting details • Education materials provided regarding pre-op preparation
Patient did not wait	• Staggered admission times • Regular communication to patients regarding expected waiting times on day of surgery
Failed to attend preadmission clinic	• Preadmission confirmation process
Failed to attend day of surgery	• Confirmation process day before surgery
No longer requires treatment	• Ensure early pre-assessment clinic • Ensure consent is complete prior to placement on waiting list • Regular audit of waiting lists
Patient requested to be removed	
Patient could not be located	• Regular audit of waiting lists • Ensure registration details are updated at time of referral to waiting list • Ensure patients are informed of the need to update details if relocating
Treated elsewhere	• Regular audit of waiting lists
Deceased prior to elective surgery	

Hospital Initiated Cancellation Reason	Preventative Strategies
Consultant cancelled booking	• Process where review of patients is undertaken prior to booking with another surgeon • Appropriate pre-assessment and triage to ensure readiness and suitability for surgery • Ensure early pre-assessment clinic • Regular audit of waiting lists
Surgeon elected not to perform case	
Consultant removed patient	
No beds available	• Agree and set bed booking quota • Review seasonal bed demands across the year to identify peak periods and adjust bed cap accordingly • Daily bed management meetings / communication with bed managers • Early identification of bed requirements (e.g. on booking form)
No ICU beds available	
No operating theatre time	• Escalation and approval process for cancellations day of surgery
Surgeon unavailable - on leave	• Business rules regarding leave planning and notification • Confirm staff rosters at theatre scheduling meetings
Anaesthetist unavailable – on leave	
Surgeon unavailable - insufficient staff	• Regular roster reviews to ensure sufficient staff to cover planned sessions • Rostering contingencies in place for locum and / or agency staff as required and at short notice • Review of staffing patterns including overtime, sick leave, fatigue leave etc.
Anaesthetist unavailable – insufficient staff	
Insufficient staff - Nursing	
Insufficient staff - Other	
Surgeon unavailable - urgent case	• Dedicated Emergency board coordinator and clear process for the referral and booking of emergency cases
Anaesthetist unavailable - urgent case	
Equipment failure/unavailable	• Processes in place for routine checks and maintenance
Priority elective	• Partially book lists 4 – 6 weeks ahead, allowing room for anticipated Category 1 or priority cases • Refer to figure 3: Elective Surgery Planning
Emergency case	• Dedicated floor coordinator roles across nursing, surgical and anaesthetic teams to enable collaborative planning of emergency surgery • Review emergency demand and the need for new / multiple dedicated emergency or trauma theatres as per the Queensland Health Emergency Surgery Access Guideline

Other Cancellation Reasons	
Removed due to audit/policy	• N/A – unlikely to be reasons for cancellation on the day of surgery and / or not preventable e.g. Natural Disaster
Case brought forward	
Transferred to other hospital	
Transferred to a non-QH facility	
Treated as Emergency	
Data Entry Error	
Natural Disaster	

Measure(s) of Success		
Measure	Use and Considerations	Qualitative Assessment
Elective Cancellations on Day of Surgery	• It is recommended that HHSs report on cancellations by cancellation reason code to review the proportion of hospital and preventable patient-initiated cancellations • Cancellations on day of surgery can be the result of a range of factors including: - Patient cancelled booking - Patient unfit due to condition or preparation - Patient did not wait - Patient failed to attend (FTA) day of surgery - Consultant cancelled booking - Surgeon elected not to perform case - No beds or ICU beds available - No operating theatre time due to list overruns - Staff unavailable - urgent leave - Staff unavailable - urgent case - Equipment failure/unavailable - Natural Disaster - Patient cancelled - priority elective - Patient cancelled – emergency case • It is also recommend that HHSs have a local escalation policy for approving cancellations on day of surgery.	• Does the hospital have a robust and effective auditing process to ensure patient details and waiting lists remain up-to-date? • Does the hospital enforce FTA, cancellation and Not Ready for Surgery (NRFS) policies as per the Elective Surgery Implementation Standard? • Is the hospital's admission times protocol appropriate and reasonable in terms of patient waiting times? • What is the hospital's process for confirming surgery to prevent last-minute cancellations and is it effective? • Does the hospital have a 'standby' waiting list to replace last minute cancellations? • How are lists reviewed and ordered to ensure availability of equipment/ prosthesis/ resources (including reps)? • Is the pre-op education material and information provided to patients adequate and appropriate? • What is the hospital's policy / procedure on elective surgery bed quotas? • Does the hospital have a cap on bed bookings which considers seasonal trends? • What is the escalation and management procedure for anticipated list overruns? • How are emergency cases requiring treatment in an elective list managed?

3.5.11 Comparative Elective Theatre Utilisation

The significance of understanding that there is no practical and easy to use single indicator that reliably summarises overall theatre efficiency is particularly relevant for Comparative Elective Theatre Utilisation, as well as traditional measures of reporting theatre utilisation. It is important to highlight that these measures are not a reflection of a HHSs efficiency or productivity.

To understand the rationale for revising the theatre utilisation metric, it is necessary to acknowledge that the historical measure of theatre utilisation (i.e. Sum of Wheels-in to Wheels-out as a percentage of available time) is fundamentally flawed as it does not enable transparency and comparability of a range of factors that vary between hospitals such as caseload, case mix and anaesthetic room availability. For example:

- It does not give consideration to the number of changeovers within a session, thus the more cases a theatre does, the lower a theatre's utilisation e.g. a morning list is 240 minutes. If 2 cases with a 20 minute changeover are completed the utilisation at best will be 92%. The next theatre is a highly efficient team who do 8 cases with 10 minute changeovers. Their utilisation at best is only 71%.
- It does not give consideration to case mix and sessions where more complex procedures are frequent and thus longer changeovers are required, resulting in lower utilisation.
- It discriminates between hospitals with anaesthetic rooms e.g. if an anaesthetic room and staff are available to permit the commencement of anaesthetic care of one patient before the completion of anaesthetic care of another patient for the same operating theatre, then the utilisation within the OR would be less than those hospitals where anaesthetic preparation is conducted In the OR.

Thus the revised comparative utilisation measure has been adopted to enable a better measure of utilisation as:

- It does not discriminate between case mix, and
- It enables better visibility of inefficiency without being distorted by different list lengths and compositions

However, similar to the limitations of other utilisation measures, this new metric still only represents the amount of time a planned operating theatre session is occupied by a patient with consideration given to the necessary changeover time required to turnaround all cases. This measure does not take into account effective rostering and allocation of staff which is crucial when considering efficiency, nor does it reflect the productivity of the time used.

For example: Team 1 may perform one Cholecystectomy in a session, taking the whole session to complete and incurring an overrun, yet reports high utilisation; however Team 2 performs three Cholecystectomies in the same session, finishes early yet reports lower utilisation due to the number of changeovers and an early finish, despite being more productive than Team 1.

Other considerations for the use of this measure include:

- Hospitals running all day lists without meal relief need to acknowledge that comparative utilisation will be unchanged but the time taken for meal breaks will be reflected by protracted average changeover times
- This measure only includes sessions that were open. Hence, if considering overall utilisation of available / planned sessions, the measure for unplanned session closures should be reviewed. For example: Five theatre sessions may be planned and available for use. However only one is actually used. The elective theatre utilisation for that one theatre could be 95% yet unplanned session closures are 80%, thus broadly inefficient
- It should be noted that the 15 minute nominal changeover time is the benchmark for hospitals that conduct the anaesthetic preparation in an anaesthetic room. Facilities without anaesthetic rooms may wish to adjust the nominal changeover time to better reflect the time between a patient exiting the operating room and the next patient entering

3.5.12 Cost per Weighted Activity Unit by Diagnosis Related Group

As referenced earlier in this document, in an Activity-Based Funding (ABF) environment, a better measure of technical efficiency for surgical services is the cost per Weighted Activity Unit (WAU) delivered by the service. However, limitations in how both costing and activity are able to be attributed solely to the operating theatres means that this measure is primarily useful for monitoring the efficiency of the whole of services, and the activity delivered across all Diagnosis Related Groups (DRGs). This is because the measure of WAU's includes costs associated with all aspects of care and is not exclusive to operating theatre expenses.

To provide a more practical use for this metric, it is recommended that HHS's limit reporting to a reasonable and manageable number of DRG's such as the top 20 highest cost variances to national average for that DRG for the HHS. HHS's may also elect to report on DRG's by Service Related Groups (SRG) to drill down to a specialty level, although it is noted that the mapping between Hospital Specialty Units and SRG's may not be 1:1. HHSs should look to compare any trends across high cost DRG's in accordance with the cost drivers outlined in section 3.6. This measure would not be applicable to HHSs that are block funded.

Furthermore, any measures based on WAU comparisons are influenced by a hospital's case mix, the degree of training the hospital is required to provide and the general speed of staff thus benchmarking should be undertaken with similar hospitals.

Depending on the HHS's level of maturity in terms of costing and coding, this measure should only be used indicatively and as a general reference for overall surgical efficiency.

3.5.13 Elective Surgery Patients Treated within Clinically Recommended Time by Category

This measure has been referenced in the guideline as it is currently the primary Key Performance Indicator in HHS Service Agreements relating to elective surgery. It represents one of the core principles for improving theatre efficiency, to ensure patients have safe and timely access to elective surgery at all Queensland Public Hospitals.

3.6 Managing High Cost Drivers

Overall costs of an operating theatre include both fixed and variable costs as well as direct and indirect costs, with the key elements contributing to the total cost of operating theatres broadly represented below:

Fixed (Indirect) Costs that remain relatively constant irrespective of variations	Variable (Direct) Costs that vary relative to the volume of activity
For example: • Infrastructure • Capital equipment • Depreciation • Overheads • Licences and levies	**For example:** • Staff wages / salaries • Overtime and other non-standard wages • Consumables • Disposable equipment • Prosthetics • Stationery and other supplies • Communications expenses

Hospitals can control variable costs by managing the use of their theatres, effective purchasing and efficient rostering practices. It is through understanding the operating theatre's high cost drivers (i.e. any activity that can significantly impact total costs) that HHSs may be able to reduce such variable costs.

In order to monitor, review and act on cost drivers to reduce expenditure, it is equally important that complete and quality data is readily available. The role of a dedicated data manager should be considered to ensure measuring and reporting is accurate and reliable.

The following table, derived from the NSW Agency for Clinical Innovation as evidenced from the University of Wollongong Literature Review, outlines the common cost drivers for operating theatres:

Figure 7 OT Cost Drivers

Cost driver	Detail
Anaesthetic drugs	The type of anaesthetic used for the procedure will drive both the costs of anaesthetic staff and equipment
Blood products	The volume and type of blood products used during a procedure
Delays and cancellations	On the day of surgery can result in theatre downtime, unless other surgical cases can be scheduled at short notice
Diagnostic services	Pathology and imaging services that are provided during the procedure

Duration of procedure	Time is a key predictor of cost in operating theatres
Medical and surgical supplies	The range of reusable and disposable instruments, the surgical solution and the pick lists required by surgeons have a significant bearing on the procedure cost. Although some expensive consumables may be associated with a reduction in length of stay, the increased OT cost may result in an overall decrease in the episode cost
Models of care	Undertaking minimally invasive procedures that do not require the infrastructure of an OT in a specialised procedure suite or other non- surgical spaces such as intensive care or clinics will result in different costs
Prostheses	The type of prosthesis used significantly influences some procedure costs. The negotiation of contracts with suppliers may also be of interest
Staffing intensity	One of the most significant cost drivers in the OT is the number, seniority and skill mix of the staff in attendance. The complexity of the procedure and/or the patient morbidities will drive the required staffing intensity
Surgical technique	One of the biggest influences on duration is surgical technique and behaviour
Technology/Equipment	Less invasive surgical procedures using newly available technologies are the most costly in the operating theatre but are associated with a reduction in length of stay and potentially increasing OT costs but decreasing total episode costs
Turnover time	The time taken to set up between a finished case and the next case will influence the throughput and therefore the cost per minute
Wastage	The amount of wastage of drugs and clinical supplies will also influence the costs

Source: NSW Agency for Clinical Innovation (2014)

4. Aboriginal and Torres Strait Islander Considerations

Queensland public hospital services and staff recognise and commit to the respect, understanding and application of Aboriginal and Torres Strait Islander cultural values, principles, differences and needs when caring for Aboriginal or Torres Strait Islander patients.

Each individual HHS is responsible for achieving successful provision of culturally appropriate surgical services to and with Aboriginal and Torres Strait Islander individuals and their communities within the respective HHS catchment.

Equally, the respect and acknowledgement extended to Aboriginal and Torres Strait Islander people will be extended to all participants, irrespective of ethnic background or membership of community group.

5. Abbreviations

ABF	Activity Based Funding
BMI	Body Mass Index
DRG	Diagnosis Related Group
FTA	Failed to Attend
FY	Financial Year
HHS	Hospital and Health Service
ICU	Intensive Care Unit
KPI	Key Performance Indicator
NRFS	Not Ready for Surgery
NESUCG	National Elective Surgery Urgency Categorisation Guideline
OR	Operating Room
QAO	Queensland Audit Office
SRG	Service Related Group
TPOT	The Productive Operating Theatre
WAU	Weighted Activity Unit

6. References

Supporting Documents

- Elective Surgery Implementation Standard – Queensland Health
- Emergency Surgery Access Guideline – Queensland Health
- Queensland Audit Office – Queensland public hospital operating theatre efficiency: Volume one, Report 2015-16
- Queensland Health Clinical Services Capability Framework v3.2, 2014
- Queensland Health – Guide to Informed Decision-making in Healthcare
- State of Queensland (Queensland Health) - My health, Queensland's future: Advancing health 2026
- The Australian Institute of Health and Welfare (AIHW) – Australian hospital peer groups

Related Documents

- Agency for Clinical Innovation 2014, Operating Theatre Efficiency Guidelines: A guide to the efficient management of operating theatres in New South Wales hospitals, Agency for Clinical Innovation, Chatswood
- Audit Office of New South Wales, 2013, New South Wales Auditor-General's report performance audit: Managing operating theatre efficiency for elective surgery, Audit Office of New South Wales, Sydney

- Metro North Hospital and Health Service 2015, MNHHS operating theatre guideline – defining Metro North theatre performance, Metro North Hospital and Health Service, Herston
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- Pandit, J, Stubbs, D, Pandit, M 2009, 'Measuring the quantitative performance of surgical operating lists: theoretical modelling of 'productive potential' and 'efficiency'', Anaesthesia Journal of the Association of Anaesthetists of Great Britain and Ireland, vol. 64, PP 473 – 486
- Stapleton P., Henderson A., Creedy D.K. et al. (2007) Boosting morale and improving performance in the nursing setting. Journal of Nursing Management 15 (8), 811–816.

7. Appendices

Appendix A: Theatre Efficiency Measures and Metrics

Appendix B: Definitions

Appendix C: Management Committee Membership

Appendix D: Operating Theatre Efficiency Performance Indicator Attribute Sheets

Appendix A: Theatre Efficiency Measures and Metrics

As described in Section 2 of the guideline, where measures and KPI's have been described, statewide targets will not be set for the first year of implementation. The approach to establishing targets and benchmarks will follow a progressive, evidence-based approach whereby collection for the first 12 months will focus on assessing relative performance to enable the Department to understand the level of variation. This will ensure appropriate targets are set in the future with the expectation that these will be applied as stepped improvement targets from Year 2 of the implementation plan.

The following outlines the range of measures and metrics as described in the Theatre Efficiency Guideline, listed in alphabetical order for ease of reference.

Alignment with National Elective Surgery Urgency Categorisation Guideline (NESUCG)	
Description	Percentage of patients whose assigned clinical urgency category aligns with that described in the National Elective Surgery Urgency Categorisation Guideline
Calculation	**Denominator**: The count of patients whose procedure code (ACHI code) maps to an ACHI code listed in the NESUCG **Numerator**: of those patients whose procedure code maps to an ACHI code listed in the NESUCG, the count of those patients whose assigned category is the same as that listed in the NESUCG **Formula**: (Numerator ÷ Denominator) x 100%
Inclusions	Procedures listed within the NESUCG Elective cases
Exclusions	Procedures excluded from the NESUCG Emergency cases
Goal	Year 1: Local target and assessment of relative performance Year 2 onwards: Stepped improvement targets to be established
Associated Indicators	• Elective Surgery Long Wait Patients • Elective Surgery Treated Within Clinically Recommended Time by Category

Average Changeover Time	
Description	Average time between all cases treated in elective sessions measured from previous case 'Out OR' to next case 'In OR'
Calculation	$\frac{\text{Sum of ['Out OR' - 'In OR'] for all cases treated in an elective session}}{\text{Number of patients treated – Number of sessions}}$
Inclusions	Elective and Emergency cases performed in elective sessions only Open sessions
Exclusions	Planned closures (A session closed on or after 48 hours prior to the session start time) Unplanned closures (A session closed within 48 hours of the session start time)
Goal	Year 1: Local target and assessment of relative performance Year 2 onwards: Stepped improvement targets to be established
Associated Indicators	• Comparative Elective Theatre Utilisation • Booked versus Actual Time • Elective Delays • Emergency Cases in Elective Sessions

Average Elective Pre-Procedure Anaesthetic Care Start Time	
Description	Average time from 'In Anaesthetic' to 'Procedure Start' for the first case of an elective morning or all day session.
Calculation	$\frac{\text{Sum ('In Anaesthetic' to 'Procedure Start') for 1st cases of an elective morning or all day session}}{\text{Number of 1st cases in elective sessions}}$
Inclusions	Elective cases in elective sessions 1st cases within morning only sessions 1st cases within all day sessions
Exclusions	1st cases within afternoon only sessions Sessions where the 1st case is an Emergency case
Goal	Year 1: Local target and assessment of relative performance Year 2 onwards: Stepped improvement targets to be established
Associated Indicators	• Booked versus Actual Time • Starting on Time • Average Late Start Minutes

Average Late Start Minutes	
Description	Of those lists starting late, the average time (minutes) by which they started late A late start is defined as any session where the first case In OR time is after the scheduled session start time
Calculation	$\frac{\text{Sum [In OR - Session Start] for sessions starting late}}{\text{Number of sessions starting late}}$
Inclusions	Elective and Emergency cases in elective sessions, including morning, afternoon and all-day sessions Open sessions
Exclusions	Planned closures (A session closed on or earlier than 48 hours prior to the session start time) Unplanned closures (A session closed within 48 hours of the session start time)
Goal	Year 1: Local target and assessment of relative performance Year 2 onwards: Stepped improvement targets to be established
Associated Indicators	• Starting on time • Average Elective Pre-Procedure Anaesthetic Care Time • Elective Delays

Average Recovery Delay Between Ready for Discharge to Discharge	
Description	Average time taken between when an elective patient is ready for discharge to when they are actually discharged
Calculation	$\frac{\text{Discharge time} - \text{Ready for Discharge time for each patient}}{\text{Number of Discharges}}$
Inclusions	Elective cases
Exclusions	Emergency cases Patients that bypass recovery
Goal	Year 1: Local target and assessment of relative performance Year 2 onwards: Stepped improvement targets to be established
Associated Indicators	• Finishing on Time – overruns • Elective Delays

Booked versus Actual Time	
Description	Comparison between booked total case time (how the session was planned to be used) and actual total case time (how the session was actually used) Includes late and early starts and finishes and changeover times
Calculation	$\frac{\text{[Last Case Out OR] – [First Case In OR]}}{\text{Total planned session minutes}} - \frac{\text{Total booked elective minutes}}{\text{Total planned session minutes}}$ **x 100%**
Inclusions	Open sessions Elective and Emergency cases performed in elective sessions only
Exclusions	Planned closures (A session closed on or earlier than 48 hours prior to the session start time) Unplanned closures (A session closed within 48 hours of the session start time)
Goal	Year 1: Local target and assessment of relative performance Year 2 onwards: Stepped improvement targets to be established
Associated Indicators	• Comparative Elective Theatre Utilisation • Finishing On Time – Overruns (Late Finishes) • Finishing On Time – Underruns (Early Finishes)

Comparative Elective Theatre Utilisation		
Description	A comparative measure of overall theatre utilisation that considers the total time the operating theatre is actually occupied by a patient in the OR, and the necessary time for changeover (by applying a nominal changeover time) as a percentage of the planned time for elective sessions. The occupied 'In OR time' is measured according to the fundamental 'Wheels in, Wheels Out' measure.	
Calculation	$\frac{\{[\text{Sum (In OR to Out OR) for all cases}] + [(\text{Number cases} - 1) \times \text{nominal changeover time}]\}}{\text{Sum of Planned Elective Session Time}} \times 100\%$ ➢ If the first case In OR time is prior to session start time, then the session start time is to be used as the In OR time ➢ If the last case out OR time is after the sessions end time, then the session end time is to be used as the out OR time	
Inclusions	Elective and Emergency cases performed in elective sessions Open sessions Late starts Early finishes	
Exclusions	Emergency and Trauma Sessions Planned closures (A session closed on or earlier than 48 hours prior to the session start time) Unplanned closures (A session closed within 48 hours of the session start time)	
Goal	Year 1: Local target and assessment of relative performance Year 2 onwards: Stepped improvement targets to be established	
Associated Indicators	• Elective session utilisation • Booked versus Actual Time • Starting on Time & Average Late Start Minutes • Finishing on Time – Late Finishes & Early Finishes	• Average Changeover Time • Elective Delays • Elective Cancellations on Day of Surgery • Emergency cases in elective sessions

Cost per Weighted Activity Unit (QWAU)	
Description	Cost per Weighted Activity Unit (QWAU) by surgical diagnosis related groups (DRG)
Calculation	For each patient separation with theatre utilisation: $\frac{\text{Sum of the total cost (excluding depreciation and patient travel)}}{\text{Sum of those same separation's Queensland Weighted Activity Unit}}$
Inclusions	In accordance with the National Hospital Costing Standards, all costs associated with the patient treatment are to be attributed to the episodes of care, derived by clinical and administrative information systems, based on each departmental review of relative value units for the hospital identified intermediate products
Exclusions	Depreciation and patient travel costs are to be excluded from the numerator sum of total costs
Goal	HHS's should utilise the National Benchmarking Portal available through System Performance Reporting (SPR) to compare their Cost per WAU by DRG nationally and identify variances to inform targeted improvements
Associated Indicators	All

Elective Cancellations on Day of Surgery	
Description	Percentage of all elective patients cancelled on the day of surgery for both hospital and patient initiated reasons by cancellation reason code. It is recommended that hospitals report separately on hospital initiated and preventable patient initiated cancellations from all other cancellation reasons
Calculation	Total number of patients cancelled day of surgery **x 100%** Total number of patients booked to be treated on day Day of surgery = any patient cancelled after 00:00 hours on the day of surgery
Inclusions	Elective cases
Exclusions	Emergency cases
Goal	Year 1: Local target and assessment of relative performance Year 2 onwards: Stepped improvement targets to be established **NB**: Refer to Operating Theatre Efficiency Proposed Performance Indicator Attribute sheet – Preventable Day of Surgery Cancellations
Associated Indicators	• Comparative Elective Theatre Utilisation • Starting on Time • Average Late Start Minutes • Finishing on Time – Overruns • Elective Delays • Emergency Cases in Elective Sessions

Elective Delay Minutes	
Description	Total delays (in minutes) resulting from late starts (patients entering the OR after the scheduled session start time) and prolonged changeover times (change over time >15 minutes).
Calculation	[Sum of all reported Late Starts] + [Sum of all reported extended Changeovers] Late Start: [In OR Time – Session Start Time] where In OR time > Scheduled Session start Time Extended changeover time: [In OR - Out OR for previous case within the same session] if greater than 15 minutes
Inclusions	Elective and Emergency cases performed in elective sessions only Open sessions
Exclusions	Planned closures (A session closed on or earlier than 48 hours prior to the session start time) Unplanned closures (A session closed within 48 hours of the session start time)
Goal	Year 1: Local target and assessment of relative performance Year 2 onwards: Stepped improvement targets to be established
Associated Indicators	• Starting on Time • Average Late Start Minutes • Finishing on Time – Overruns • Emergency Cases in Elective Sessions

Elective Surgery Long Wait Patients	
Description	The percentage of patients waiting longer than the clinically recommended time for their Category 1, 2 or 3 Elective surgery
Calculation	**Denominator:** The number of patients waiting for treatment for elective surgery by category **Numerator**: The number of patients who are waiting for treatment for elective surgery who have been waiting greater than 30 days (≤ 30 days) if a category 1, greater than 90 days (≤ 90 days) if a category 2, or greater than 365 days (≤ 365 days) if a category 3. **Formula**: (Numerator ÷ Denominator) x 100%
Inclusions	Elective cases Category 1, 2 and 3 Ready for Surgery and Not Ready for Surgery
Exclusions	Category 4, 5, 6 and 9 Emergency cases Outsourced patients
Goal	≤ 2% category 1 and ≤ 5% for category 2 and 3
Associated Indicators	• Elective Surgery Treated Within Clinically Recommended Time by Category • Net Additions to Waiting List

Elective Surgery Treated Within Clinically Recommended Time by Category	
Description	The percentage of patients who received elective surgery and were treated within the clinically recommended time for their urgency category Elective surgery patients treated are those who were registered on a surgical waiting list as a category 1, 2 or 3, with a surgical specialty, and were removed because they received their surgery as an elective or emergency patient. The waiting time is calculated as the difference between the date the patient was placed on the waiting list and the date the patient was removed from the waiting list, excluding any periods the patient was not ready for surgery and any periods that the patient was waiting at a less urgent category than their category at removal
Calculation	**Numerator**: The number of patients who received elective surgery who were treated within 30 days (≤ 30 days) if a category 1, within 90 days (≤ 90 days) if a category 2, or within 365 days (≤ 365 days) if a category 3. **Denominator**: The number of patients who received elective surgery for each respective category **Formula**: (Numerator ÷ Denominator) x 100%
Inclusions	Elective cases with a status of 'Treated' at the reporting hospital Elective cases with a removal status of 'Treated as Emergency' Category 1, 2 and 3
Exclusions	Category 4, 5, 6 and 9 Outsourced patients
Goal	≥ 98% category 1 and ≥ 95% for category 2 and 3
Associated Indicators	• Elective Surgery Long Wait Patients • Net Additions to Waiting List

Emergency Cases in Elective Sessions	
Description	Percentage of planned elective session time occupied by emergency cases
Calculation	Sum of emergency case minutes performed within an elective session **x 100%** Sum of planned elective session minutes ➢ If the first case In OR time is prior to session start time, then the session start time is to be used as the In OR time ➢ If the last case out OR time is after the sessions end time, then the session end time is to be used as the out OR time
Inclusions	Emergency cases performed in elective sessions only
Exclusions	
Goal	Year 1: Local target and assessment of relative performance Year 2 onwards: Stepped improvement targets to be established
Associated Indicators	• Emergency Theatre Utilisation • Out of Hours Emergency Cases

Emergency Theatre Occupancy	
Description	A measure of 'In Operating Room' use that reflects how much time the operating theatre is occupied by a patient as a percentage of the planned time for emergency surgery sessions. This is measured according to the fundamental 'Wheels in, Wheels Out' measure
Calculation	Sum (In OR to Out OR) for all cases within an emergency session **X 100%** Sum of Planned emergency Session Time • Changeover times are not included as occupied 'In OR' time • If the first case In OR time is prior to session start time, then the session start time is to be used as the In OR time (not applicable to 24 hr theatres) • If the last case out OR time is after the sessions end time, then the session end time is to be used as the out OR time (not applicable to 24 hr theatres)
Inclusions	Elective and Emergency cases performed in emergency and trauma sessions Open sessions Late starts Early finishes
Exclusions	Planned closures (A session closed on or earlier than 48 hours prior to the session start time) Unplanned closures (A session closed within 48 hours of the session start time)
Goal	Year 1: Local target and assessment of relative performance Year 2 onwards: Stepped improvement targets to be established
Associated Indicators	• Emergency Cases in Elective Sessions • Out of Hours Emergency Cases

Finishing On Time – Overruns (Late Finishes)	
Description	Percentage of elective sessions where the last case exits the Operating Room 30 minutes or more ***after*** the scheduled session end time A late finish is defined as any session where the last case exits the OR greater than 30 minutes after the scheduled session end time.
Calculation	Number of Elective sessions where the last case exits the OR > 30 minutes after the scheduled session end time **x 100%** Total number of planned elective sessions
Inclusions	Elective and Emergency cases in elective sessions, including morning, afternoon and all-day sessions Open sessions
Exclusions	Planned closures (A session closed on or earlier than 48 hours prior to the session start time) Unplanned closures (A session closed within 48 hours of the session start time)
Goal	Year 1: Local target and assessment of relative performance Year 2 onwards: Stepped improvement targets to be established
Associated Indicators	• Starting On Time • Average Late Start Minutes • Elective Delays • Booked versus Actual Time • Emergency Cases in Elective Sessions

Finishing On Time – Underruns (Early Finishes)	
Description	Percentage of elective sessions where the last case exits the Operating Room 45 minutes or more ***before*** the scheduled session end time An early finish is defined as any session where the last case exits the OR greater than 45 minutes before the scheduled session end time.
Calculation	Number of Elective sessions where the last case exits the OR > 45 minutes before the scheduled session end time **x 100%** Total number of planned elective sessions
Inclusions	Elective and Emergency cases in elective sessions, including morning, afternoon and all-day sessions Open sessions
Exclusions	Planned closures (A session closed on or earlier than 48 hours prior to the session start time) Unplanned closures (A session closed within 48 hours of the session start time)
Goal	Year 1: Local target and assessment of relative performance Year 2 onwards: Stepped improvement targets to be established
Associated Indicators	• Booked versus Actual Time • Elective Cancellations on Day of Surgery

Net Additions to Waiting List	
Description	The difference between the number of patients added to the elective surgery waiting list and the number of patients removed (either treated or removed)
Calculation	[No. patients added to waiting list] – [No. patients treated from the waiting list] – [No. patients removed from the waiting list]
Inclusions	Elective cases All Categories
Exclusions	Emergency cases
Goal	Year 1: Local target and assessment of relative performance Year 2 onwards: Stepped improvement targets to be established
Associated Indicators	• Elective Surgery Treated Within Clinically Recommended Time by Category • Elective Surgery Long Wait Patients • Comparative Elective Theatre Utilisation

Out of Session Emergency Case Time	
Description	Number of emergency case minutes performed out of session (i.e. not within a planned session) as a percentage of the total emergency minutes used by category
Calculation	Sum of emergency case minutes performed out of session x 100% Total number of emergency case minutes used
Inclusions	Emergency cases performed outside a planned elective or emergency session
Exclusions	
Goal	Year 1: Local target and assessment of relative performance Year 2 onwards: Stepped improvement targets to be established
Associated Indicators	• Emergency Theatre Utilisation • Emergency Cases in Elective Sessions

Starting On Time	
Description	Percentage of elective sessions where the first case In OR time is ***on*** or ***before*** the scheduled session start time A late start is defined as any session where the first case In OR time is after the scheduled session start time
Calculation	Number of Elective sessions where the first case In OR time is on or before the scheduled session start time / Total number of planned elective sessions **x 100%**
Inclusions	Elective and Emergency cases in elective sessions, including morning, afternoon and all-day sessions Open sessions
Exclusions	Planned closures (A session closed on or earlier than 48 hours prior to the session start time) Unplanned closures (A session closed within 48 hours of the session start time)
Goal	Year 1: Local target and assessment of relative performance Year 2 onwards: Stepped improvement targets to be established **NB**: Refer to Operating Theatre Efficiency Proposed Performance Indicator Attribute sheet – Elective Operating Session On-time Starts
Associated Indicators	• Average Elective Pre-Procedure Anaesthetic Care Time • Average Late Start minutes • Finishing On Time – Overruns (Late Finishes) • Elective Delays

Total Patients Treated	
Description	Total number of patients treated by operation type (Elective or Emergency)
Calculation	Count of Elective patients treated Count of Emergency patients treated
Inclusions	Treated cases (treated at the reporting hospital)
Exclusions	Cancelled cases Patients treated at another facility via outsourcing arrangements
Goal	Year 1: Local target and assessment of relative performance Year 2 onwards: Stepped improvement targets to be established
Associated Indicators	All indicators

Treat In Turn	
Description	The percentage of Category 2 and 3 Elective Surgery patients treated in turn
Calculation	As per Treat in turn calculation fact sheet located at: http://qheps.health.qld.gov.au/caru/nest/docs/fs-treat-in-turn.pdf
Inclusions	Refer to above factsheet
Exclusions	Refer to above factsheet
Goal	≥ 60%
Associated Indicators	• Elective Surgery Treated Within Clinically Recommended Time by Category • Elective Surgery Long Wait Patients • Net Additions to Waiting List

Unplanned Session Closures	
Description	Measure of how many planned elective sessions are closed at late notice (within 48 hours of the planned session time) over the total number of planned elective sessions.
Calculation	$\frac{\text{Total count of unplanned elective session closures}}{\text{Total count of planned elective sessions (including unplanned session closures)}}$ **x 100%** A session is defined as either a morning, afternoon or all-day session
Inclusions	Elective and Emergency cases performed in elective sessions only Open sessions Unplanned closures (A session closed within 48 hours of the session start time)
Exclusions	Planned closures (A session closed on or earlier than 48 hours prior to the session start time)
Goal	Year 1: Local target and assessment of relative performance Year 2 onwards: Stepped improvement targets to be established
Associated Indicators	• Comparative Elective Theatre Utilisation • Total Patients Treated

Appendix B: Definitions

Scheduling Definitions	
Master Theatre Template	A theatre template is built on funded sessions and is the blueprint of recurring sessions applied to a specific week and to a specific theatre. The template must contain session start and finish times. The template is not changed on a daily basis
Planned Session	Often referred to as a funded session. A session where all required resources have been financially apportioned within the current Surgical Services budget
Planned Closure	A session closed on or after 48 hours prior to the session start time This includes Public holidays
Unplanned Closure	A session closed within 48 hours prior to the session start time
Session	The normal period of time available to be allocated to a physician / surgeon / service for surgery. Sessions, for example, can be morning only, afternoon only or all-day sessions. The actual period may vary from one facility to another but is typically 3.5 to 4 hours for a morning or afternoon session and 7 to 8.5 hours for an all-day session
Session Start	Time session is scheduled to commence. This should be the time the first case is planned to enter the OR
Session End	Time session is scheduled to be completed. This should be the time the last patient is planned to exit the OR
Elective Session	A session allocated for elective cases including all patients on a category 1 – 9 waiting list
Emergency Session	A session allocated for emergency cases. I.e.: Category A – E patients
Trauma Session	A session allocated for emergency cases which are primarily trauma-related I.e. Category D – E patients
Changeover Time	Time (mins) between the completion of a case recorded by Out OR time to the commencement of the next case, recorded by In OR time in a continuous session. Also referred to as Turnaround time
Late start	Any session where the first case In OR time is after the session start time
Early start	Any session where the first case In OR time is prior to the session start time

Overrun (Late Finish)	Any session where the last case exits the OR either on or greater than 30 minutes after the session end time
Underrun (Early finish)	Any session where the last case exits the OR either on or greater than 45 minutes before the session end time
After Hours Emergency	Referred to as any emergency surgery performed between the hours of 22:00 – 08:00 as described as outside standard emergency hours in the Emergency Surgery Access Guideline

Operating Room Time Stamps	
In Suite Time	Time the patient arrives in the operating suite or procedure room.
In Anaesthetic Time	Time when an anaesthetist begins preparing the patient for an anaesthetic, (eg. IV cannulation, eye blocks). This may occur inside or outside of the operating room. **NB**: Hospitals that commence anaesthetic outside the OR must ensure robust processes are in place to communicate and record the accurate 'In Anaesthetic' time as this may not be visible to the staff in the OR responsible for the data entry.
In OR Time	Strictly interpreted as the time the patient enters the operating room. Often referred to as "Wheels in" to OR.
Procedure Start Time	The earlier time of either the specific positioning of the patient for surgery or commencement of the skin preparation.
Procedure Finish Time	Time when all the instruments and sponge counts are completed and verified as correct; all postoperative radiological studies to be done in the operating Theatre or procedure room are completed; all dressings and drains are secured; and the surgeon(s)/physician(s) has completed all procedure related activities on the patient. Whilst not a data qualifier for procedure finish time, it is still mandatory that the surgical safety checklist is completed for all patients undergoing surgery.
Out OR Time	Time at which the patient leaves the operating room or procedure room. Often referred to as "Wheels Out" OR
Arrival in Recovery	Time of patient arrival in Recovery
Ready for Transfer (Recovery)	Time when patient is ready to move from Stage 1 to Stage 2 Recovery
Transfer from Recovery	Time the patient is transported out of the Recovery

NB: The above key terms are non-system specific thus the time stamp descriptions have been defined to represent the process occurring at each point of the patient journey regardless of individual system's naming conventions

Appendix C: Management Committee Membership

Membership of the Theatre Management teams will depend on the size and structure of each hospital and may or may not require the existence of sub-groups responsible for operational and other issues. The table below outlines possible membership and co-opted members as required:

Membership	Theatre Management Committee	Theatre Scheduling Committee
Chair	Head of Operating Theatre	Head of Operating Theatre
Core	• General Manager / Operational Manager (where applicable) • Heads of Operating Theatre - Nursing - Medical – Surgery - Medical – Anaesthetics • Floor Coordinators - Nursing - Medical – Surgery - Medical – Anaesthetics • Clinical Directors • Nurse/Unit Managers for: - Theatre, - Day Surgery - Surgical Ward • Admissions Manager • Waiting List Manager • Pre Admission Manager • Data Manager • Finance Manager	• Heads of Operating Theatre - Nursing - Medical – Surgery - Medical – Anaesthetics • Floor Coordinators - Nursing - Medical – Surgery - Medical – Anaesthetics • Delegate/representative from each relevant specialty (e.g.: Orthopaedics, Gynaecology) • Admissions Manager • Waiting List Manager • Pre Admission Manager • Data Manager

Optional	• Support Service Managers (Eg: Orderlies, supply, medical imaging, pharmacy) • Case Manager • Infection Control Manager • Information Manager • Security and Porterage Manager • Sterilisation Department Representative • Nurse Educator • HR Manager • OH&S Manager • Patient Liaison / Consumer Advisory Representatives • Emergency Department Manager • Bed Manager / After Hours Manager

Policy Custodian:

Executive Director, Healthcare Improvement Unit, Clinical Excellence Division

Version Control

Version	Date	Comments
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