Consultation Paper

new RAH Central Sterile Services Department ("CSSD") Model
Surgical Directorate
Central Adelaide Local Health Network

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1. Introduction

The Central Adelaide Local Health Network ("Central Adelaide LHN") is one of five (5) Local Health Networks ("LHN’s") in South Australia. The population of Central Adelaide LHN is estimated to represent 27% of the total State’s population. According to the recent Department of Planning and Local Government projections, the population is likely to increase to approximately 471,000 by 2016, to 488,000 in 2021 and 503,000 in 2026.

Central Adelaide LHN brings together four (4) hospitals: Royal Adelaide Hospital ("RAH"), The Queen Elizabeth Hospital ("TQEH"), Hampstead Rehabilitation Centre and St Margaret’s Rehabilitation Hospital, and a significant number of Mental Health (including Glenside Campus) and Primary Health Care Services. Central Adelaide LHN also governs a number of state-wide services including SA Dental, BreastScreen SA, DonateLife SA and Prison Health Care Services.

Central Adelaide LHN is committed to delivering the highest quality health care possible and taking active steps to continuously review and improve its services.

Since the release of South Australia’s Health Care Plan 2007-2016 ("SA Health Care Plan"), it has been widely acknowledged by Central Adelaide LHN that we would need to change some key aspects of our day-to-day business and service delivery to ensure that we can continue to provide services to our community into the future. Increasing pressures that Central Adelaide LHN is faced with as part of the public health system include:

- an ageing population with growing health care needs;
- rises in chronic disease;
- pressure to ensure we have enough clinicians and support staff to deliver services effectively; and,
- delivering sustainable services with a limited health budget resource.

The Central Adelaide LHN is committed to achieving the Vision set out in the SA Health Care Plan and in particular ensuring that we provide the best services possible to patients and that we find innovative ways of achieving this. Given the pressures we are facing and the need to make sure we can continue to provide services to the community, we have no choice but to change.

To this end, and consistent with the vision articulated in the SA Health Care Plan, Central Adelaide LHN has embarked on a journey to change its approach to health care and the way it delivers health care services into the future.

2. Purpose

The purpose of this paper is to describe the workflow concepts and the associated design implications for the Central Sterile Services Department ("CSSD") in the new Royal Adelaide Hospital ("new RAH"). The CSSD model will provide a centralised and standardised reprocessing system, for the management of reusable medical devices ("RMDs"). The exception to this being the endoscope processing room which will function as a satellite service provided by CSSD. This is a change from the current decentralised model.

Following consultation on this paper and further review of the workforce requirements due to the introduction of new technology in the new RAH, further consultation may be needed once the workforce requirements are understood.
3. **Current Model**

Currently the majority of RMDs are processed through CSSD which is staffed over a 24 hours, 7 days a week period. CSSD is staffed by Health Ancillary personnel (“WHA”) who are supported by a manager and training staff.

Some specialised RMDs, such as flexible scopes, transoesophageal probes and ultrasound probes, are currently being reprocessed by nurses and ward attendants within the following clinical areas:

- Womens Health Centre;
- Urology;
- Speech Pathology;
- Radiology;
- Radiation Oncology;
- Thoracic Procedural Suite (S2);
- Operating Theatres;
- Cardio-thoracic Theatres;
- CVIU;
- ICU; and
- Emergency Department.

Some of these specialised RMDs are managed by a two part process; firstly being cleaned within a clinical area and then sent to CSSD for final packing and sterilisation.

3.1 **Current Workforce Model**

The Nursing Director - Operating Room Service, Central Adelaide LHN has management oversight and responsibility for CSSD and its performance and inter-relationship with the TQEH CSSD. This governance model will not change.

Direct Line management of CSSD is provided by a CSSD Manager, who reports directly to the Nursing Director, Operating Room Services, Central Adelaide LHN. The CSSD Manager is delegated financial, human resources and operational responsibilities to a level determined by the organisation.

Direct supervision of staff is performed by Team Leaders, who are rostered so as to provide continuity throughout all shifts. Team Leaders liaise with clinical areas to address actual or anticipated service requirements, allocate duties to staff members and ensure efficient operation of their designated shifts.

**Staff Training and Rostering**

A training and mentorship system is in place which supports the division of workflows within CSSD into ward based flows and theatre flows. Staff are commenced on the lower complex activity (ward) and progressed to the more complex activity (theatre). Functionally, this system has created segregation, with staff choosing to work on one side or another, limiting the readiness and flexibility of the workforce.

Historical rostering practices have furthermore segregated staff into several different roster groups, who operate in combinations of fixed, rotational, 7-days or 5-days patterns, which does not match a pattern of activity or clinical need. This reduces the effectiveness of the CSSD to support the organisation’s goals, such as meeting Elective Surgery Strategy targets.
4. **Rationale for Change**

A fundamental rationale for changes to CSSD workflows is the new RAH functional design. The new CSSD is located on Level Five (5) directly above the Technical Suite, and will operate with the most modern of equipment and technologies, including:

> Automated transfer systems throughout the reprocessing zones;
> Facility-wide mechanised distribution and collection systems; and
> Computerised Instrument Tracking System.

All RMD reprocessing will be centralised to the Level Five (5) CSSD or Level Four (4) Scope Cleaning Room.

This design configuration has introduced new workflows and staffing impacts which need to be factored into roster and training plans.

The Computerised Instrument Tracking System (T-DOC) will impact on CSSD staff at all stages of reprocessing, requiring a training and computer skills development program.

5. **Future Model**

5.1 **Scope of the Future Model**

The new RAH CSSD model will incorporate automated and mechanised distribution, storage and collection services for a range of areas, reducing the dependency on manual handling and improving work health and safety practices.

The design of the new RAH CSSD has more clearly delineated the individual stages of RMD reprocessing, and the staffing needs attached to each stage of this activity. Each stage is segregated by the physical barriers of the fixed equipment, and therefore results in the decreased ability for staff to move between dirty and clean areas as we now have. This will support fixed staff levels to activity stages.

The following diagram demonstrates the flows in and out of the CSSD service.
5.2 **Description of Service**

The CSSD space has been designed to facilitate optimal workflows and efficiencies, as well as have air conditioning, ventilation, emergency power, steam supply, electric and gas supplies, that comply with the relevant Quality Standards.

CSSD is responsible for:

- collecting, decontaminating, assembling, packing, sterilising, storing and distributing a range of reusable medical devices to all patient areas;
- coordinating instrument repairs;
- fast tracking the decontamination and reprocessing of reusable medical devices (where necessary); and
- storing single use sterile items used in the Technical Suite.

All reprocessing of RMDs have been centralised under CSSD management, including flexible scopes, probes and ultrasound handpieces which are currently managed within dispersed clinical areas. Those items requiring sterilisation will be transported and reprocessed through Level Five (5) and those items requiring high level disinfection will be transported and reprocessed through the Level Four (4) Scope Cleaning Room.

A major change to current staff workflows by the new design is seen in the decrease of manual handling related to staff picking up products from clinical areas and physical transport of sterile items from CSSD to Theatres. The majority of goods for reprocessing will come from the Technical Suite rooms via Case Carts and AGVs and will be received by CSSD staff outside the decontamination section of CSSD. This will be managed in partnership with Spotless systems and personnel. Support for the collection from and delivery of RMDs to other clinical areas such as the Outpatient and Inpatient areas will be managed through special transport carts and utilise the Spotless Help Desk facility.

CSSD will use a closed container system for the transport of equipment to and from the Technical Suite area and other areas in the facility. This system will be fully integrated with the:

- washer disinfector units;
- sterilisers;
- storage; and
- automated transfer systems.

The Facility will operate a policy of:

- 99% disposable linen (i.e. sterile towels, drapes and gowns);
- disposable instruments and procedure packs to clinical areas outside of the Technical Suite;
- where clinically safe and appropriate, disposable instrument / pack use within the Technical Suite; and,
- disposable 100% latex free anaesthetic equipment (with the exception of rubber face masks, laryngoscope blades and internal parts of the anaesthetic machines / ventilators).

Surgical list management will depend upon a new CSSD model which includes CSSD staff preparing Case Carts with supplies as identified within specialist ICT systems and revised clinical specialty information. Interfaces between ORMIS and instrument tracking systems are in development.

Some equipment used at the facility (such as specialised neurosurgery and orthopaedic equipment) shall be supplied on consignment from an external provider and will require
sterilising prior to and after use.

**Electronic Tracking of Goods System**

The CSSD has an ICT system ("T-DOC") for the electronic tracking of RMDs at each stage of the journey to, through and from the CSSD, including the identification of specific staff handling the instruments at collection, delivery and each processing stage. The system includes both single RMDs, and RMDs packed in trays.

T-DOC is integral to CSSD operations including receipt, decontamination, quality assurance, packing, sterilisation and storage. T-DOC also facilitates the distribution of hospital-sterilised RMDs from the CSSD Sterile Store on either an ad-hoc or pre-booked basis. Distribution to Technical Suite rooms is managed via T-DOC with the generation of picking lists from which case carts specific to individual procedures are stocked and dispatched.

Electronic tracking of RMDs in T-DOC also allows the creation of metadata to provide user alerts, automated process controls and supplementary information regarding the reprocessing requirements of the individual RMD. This is designed to control risks in a high-volume reprocessing environment which may otherwise result in adverse events during final use of the RMD. These include controls placed on completion of sets, RMD substitutions, acknowledgement of RMD specific maintenance and / or safety checks etc.

T-DOC is also intended to assist the CSSD in identifying and locating individual RMDs in the event of a process failure or a suspected cross-contamination incident. The use of serialised RMDs allows a patient history for each RMD to be determined and assists infection control in any risk assessment or investigation required.

The T-DOC system will also support the:

> Quality Assurance capability of plant and processes, i.e. sterilisers;
> Recall of RMDs related to process failures or patient related events;
> Prevention of human failures through alerts and controls;
> Instrument tracking i.e. an instrument used on a patient;
> Tracking of trays i.e. identifying where a tray is at any time; and,
> Special reprocessing requirements for individual RMDs.

CSSD will also use the Inventory Management System managed by Spotless.
5.3 **Physical design**

There are 2 (two) CSSD areas (as depicted in the following images):

> Level Four (4) Scope Cleaning Room; and
> Level Five (5) Central Sterile Services Department.

![Level 4 Scope Cleaning Room](image1.png)

*Level 4 Scope Cleaning Room* located within the Technical Suite Zone 5

![Level 5 Central Sterile Services Department](image2.png)

*Level 5 Central Sterile Services Department*
**Functional relationships**

The CSSD has direct access (<2 minutes) to and from the central scope cleaning area and all Technical Suite rooms on Level Four (4).

**Reception**

The CSSD reception area will receive the delivery of mail, courier deliveries and loan equipment. Items of equipment including scopes used in Outpatient Areas (e.g. Urology and ENT) will be receipted through the decontamination pathway.

**Decontamination area**

The decontamination area or dirty zone for the CSSD will accommodate the delivery, holding, pre-cleaning and high level disinfectant cleaning of dirty / soiled goods (see Appendix 1 for RMD’s Workflow). This includes the following processes:

- manual sorting;
- manual and / or automated pre-cleaning;
- ultrasonic cleaning;
- automated loading of the washing disinfectors (including a drying cycle);
- cart washers; and
- chemical high level disinfection via automated endoscopy processes.

The decontamination area will have:

- a conveyor belt system for loading / unloading;
- a rinsing area;
- bench space;
- storage for cart inserts;
- a bench top including compressed air hoses and handpieces;
- flexible washing hoses;
- roll-in cart washers;
- a separate scope decontamination area for scopes used in Outpatient Areas (e.g., urology and ENT); and
- T-DOC scanning points will be available at each decontamination station.

This area will feed into the inspection and packing and sterilisation (as per the manufacturers’ instructions) without contamination of the area.

**Washer Disinfector Units**

CSSD will have seven (7) washer disinfectors which will have a drying cycle and a central chemical dosing system.

**Inspection, packing and sterilizing area**

The inspection, packing and sterilizing area will:

- not be accessed from the dirty zone;
- accommodate the holding, inspection (including microscopic), sorting and packing of goods for sterilisation, including the following processes:
  - automatic unloading of goods from the clean side of the washer disinfectors;
  - storage of goods prior to inspection and sorting; and
  - loading of goods onto carts or transfer carriages for automated loading into the
sterilisers;
> have one (1) area with automated offloading of washer disinfectors that cannot be accessed from the dirty zone;
> have hydraulic inspection and packing tables, computers and communications systems, insulation testing machines (to be confirmed), automatic laminate sealers, plastic heat seals, stereo microscopes, trolley parking;
> have seven (7) steam sterilisers;
> have three (3) low temperature sterilisers and associated parking;
> have a distribution and packing area;
> have pick up / drop off docks, lifts and access routes to support the mechanised distribution system; and
> have reverse osmosis quality water for supplying steam generators that feed sterilizers (as required by sterilizer manufacturer specifications).

**Storage Area (Sterile Items)**
The storage area (sterile items) for the CSSD will:
> accommodate the unloading of the sterilisers (from release side door) directly into the sterile goods storage area;
> be located within the CSSD “clean zone” to ensure that contamination does not occur and should be separate from the storage area for goods that have not been processed through CSSD;
> have appropriate space for trolleys and storage areas that are large enough to satisfy the demand for sterile goods for use in Technical Suite via the Case Cart delivery model;
> have a separate area for unloading trolleys from sterilisers using automated transfer systems;
> have a cooling area for sterile loads;
> have cooling trolleys;
> have scope storage area for scopes used in Technical Suite rooms (e.g., Urology and ENT), and if required the Outpatient areas;
> have a packing and dispatch area for Case Carts; and
> have direct access to the pickup / drop off area.

**Storage Area (Non-Sterile Items)**
The storage area (non-sterile items) for CSSD will have:
> a separate storage area for non-sterile goods and goods not processed in CSSD;
> have ergonomic lifting devices;
> have appropriate space for trolleys and storage; and
> pick up/drop off docks, lifts and access routes to support the automated distribution system.

**Automated Transfer Systems**
The automated transfer systems for CSSD will:
> allow for the collection of dirty goods from the Technical Suite and other areas in the facility for processing within CSSD; and
> facilitate minimal manual handling of the goods within CSSD;
> accept and manage racked goods coming from pre-wash and ultrasonic cleaning for movement into:
>   > combined washer / disinfection/dryers; and
>   > racked goods that have been packed into sterilisation units;
> > allow automatic and manual programming;
> > be able to automatically:
>   > select, load and program available washers;
>   > unload washers (on the clean zone side of the washers);
>   > transfer the cleaned goods to a storage station in the inspection and packaging zone prior to sterilisation;
>   > load available sterilisers; and
>   > unload sterilisers (on the sterile goods storage side of the sterilisers);
> > allow for the delivery of clean / sterile goods to the Technical Suite and other clinical areas within the new RAH.

**Scope Cleaning Facilities**

An Endoscope Cleaning Room for the high level disinfection of scopes and probes will be located on Level Four (4) immediately adjacent to the Procedural Technical Suite rooms. Staffing responsibility will move from the Gastrointestinal Department’s management, realigning two (2) WHA staff to the CSSD roster, but retaining some nursing input for microbiological testing requirements.

Scope reprocessing facilities will also be provided within the Level Five (5) CSSD design and those flexible scopes which can be sterilised will be managed through this pathway (see Appendix 2 for Scope Cleaning Workflows).

**Automated Guided Vehicles (“AGVs”)**

AGVs are an integral part of new technologies at the new RAH. AGVs will distribute, deliver and collect a wide range of items across the hospital including meals, linen, waste, pharmacy, CSSD, imprest and stores (including mail). In CSSD, Spotless will only be responsible for the decanting of trolleys post use from the Technical Suite Room and general management of AGVs.

The AGVs have their own dedicated corridors and lifts. They travel at walking pace and have in built sensors, so they will always stop if they sense any obstruction. AGVs emit an audible beep when they are manoeuvring to remind anyone in the vicinity of their presence.

**Case Cart Lobby**

Sterile instruments and consumables will be packed and dispatched in a Case Cart to a Dispatch / Trolley hold area, directly outside the CSSD. AGVs will be notified of the need for collection and transport of a Case Cart by a building interface (laser detection triggers automated response).

AGVs will deliver requirements for a procedure to the Case Cart lobby on Level Four (4), ready for pickup and delivery to the required Technical Suite room. This will also include the provision of loan sets (sourced by CSSD) as ordered for particular cases.

Patient Services Support Assistants (Spotless staff) will transport the Case Carts to individual Case Cart Bays (which is outside each Technical Suite room).

**Emergency Case Carts**

Emergency Case Carts will be prepared and stored on Level Four (4). This will ensure that immediate emergency surgical procedures are not delayed awaiting the supply of
goods from Level Five (5) CSSD.

T-DOC will be able to record when emergency case carts are opened and used. It also creates a flag to CSSD for the immediate resupply of a specialist cart.

**Facility Management - Spotless**

Spotless Facility Management has a major support presence on the CSSD, throughout the building monitoring alarms and service requirements; specialised chemical supply management, imprest delivery and waste management and requires an increase in interaction between the two parties.

Building communication systems, phones and AGV scheduling systems also will be managed by Spotless Facility Management but results in additional steps within the reprocessing pathway.

5.4 **Future Workforce Model**

Historical rostering practices with staff in combinations of fixed, rotational, 7-days or 5-days patterns have limited flexibility to provide a responsive service. It is proposed that all WHA staff move to a 7 days rotational roster to ensure all staff can be allocated to any activity role in the reprocessing pathway, and to support service delivery requirements.

The CSSD Model will also introduce new workflows that will support the operational processes within CSSD and in support of the Technical Suite and clinical areas of the new RAH, aligning functions and competencies. This is particularly important where specialist knowledge is crucial to achieving clinical outcomes and compliance with Standards and Legislation.

The proposed workforce model for CSSD has identified new (additional) roles, a T-DOC Administrator and Laser Engraving role. Electronic tracking of RMDs in T-DOC requires the creation of metadata to provide user alerts, automated process controls and supplementary information regarding the reprocessing requirements of the individual RMDs, which would be undertaken by the T-DOC Administrator. A plan has been created which identified that it will take up to two (2) years to laser engrave every single RMD – both instrument or flexible scope tagging. A role, which senior staff can rotate through, would support this requirement, but also the maintenance of the laser engraving status on each RMD.

As described within the current model, some specialised RMDs, such as flexible scopes, transoesophageal probes and ultrasound probes are currently being reprocessed by nurses and ward attendants within clinical areas. In the new RAH, scope cleaning and high level disinfection will be undertaken on Level Four (4) Scope Cleaning Room which requires staffing support over an 11 hours period as well as ad-hoc support after hours. It is proposed to transfer WHA Ward Attendants currently employed by the Gastrointestinal Unit, who undertake this activity to the CSSD staff establishment.

Level Five (5) CSSD will also be undertaking scope reprocessing activity for scopes which can be sterilised. This work is also being transferred from clinical areas, such as Outpatients and the Technical Suite. Currently, clinical areas may clean their equipment prior to sending to CSSD to complete the reprocessing and sterilisation processes, but at the new RAH the scopes will be sent directly to CSSD after they are grossly decontaminated at point of use.

5.5 **Benefits of the future model**

The proposed future model will ensure:

- Improved quality assurance programs, providing electronic data which will improve reporting processes;
- Electronic storage, decreasing hard copy storage requirement and ‘human error’
factors in data collection;
> Ability to report against KPI’s and critical incidents;
> Provide evidence of complying with standards and accreditation requirements;
> Provision of a safe working environment through the increased use of automated systems, ergonomic design and the elimination of frequent manual transport of RMDs to Technical Suite; and
> Efficiencies with increased capacity to provide service.

5.6 **Implementation of the future model**

Organisational Wide Instructions (“OWI”) will be developed to ensure standard governance and guide practice delivery. These OWIs will have a Central Adelaide LHN wide consideration that will reflect the changes and will be utilised during State Operation Commissioning (“SOC”) scenarios and clinical scenario testing.

All staff will undertake basic or advanced training programs commensurate with their role, to ensure a standardised way of working with the new processes and systems.

In relation to the introduction of T-DOC, all staff will be surveyed to identify their computer skills, and training programs will be developed to upskill staff, prior to them undertaking T-DOC focussed training.

5.7 **Related change processes**

**Extension of T-DOC**

Currently T-DOC is only scoped for the Level Five (5) CSSD area, but the procurement of additional modules to extend to the Level Four (4) Scope Cleaning Room and Technical Suite rooms is currently underway.

This will allow for single instrument traceability which impacts on the CSSD workflows and staffing requirements by increasing the number of computerised steps to produce a product.

Some clinical and research facilities will not be located at the new RAH and transport processes need to be identified to support the collection of used items and the return of sterile items to these areas.

5.8 **Implications for not undertaking the change**

There is no choice but to undertake changes as we must adapt workflows and practices given the design of the new RAH.

Failure to do so will result in a fragmented working environment with inconsistent standards of practice.

6. **Feedback**

This proposal provides more detail in relation to the workflow for CSSD. There are still details that need to be determined and your feedback, suggestions and questions will assist in further refining this in preparation for the move to the new RAH.

Feedback can be provided via survey monkey [https://www.surveymonkey.com/r/centralsterileservicedepartment](https://www.surveymonkey.com/r/centralsterileservicedepartment) or in writing to Workforce Workstream, new RAH Program, Level 8, Emergency Block, Royal Adelaide Hospital, Adelaide, SA 5000.

Feedback is due by 17 October 2016.

In particular we are seeking responses to the following questions:
1. Do you have any feedback in relation to the new RAH CSSD Model?

2. Do you have any specific feedback in relation to the Computerised Instrument Tracking System (T-DOC) as described?

3. Do you have any specific feedback about the proposed changes to rosters for CSSD Attendants and new roles of T-DOC Administrator and Laser Engraver?

4. What else would you like to know about the CCSD model at the new RAH?

7. References

Australian Health Facility Guidelines
AS/NZ 4187 2014, Reprocessing of Reusable Medical Devices in Health Service Organisations
South Australia’s Health Care Plan 2007 – 2016

8. Appendix

Appendix 1 – CSSD – RMD Journey (high level)
Appendix 2 – CSSD - Scope Journey (high level)
APPENDIX 1 – CSSD – RMD Journey (high level)
APPENDIX 2 – CSSD - Scope Journey (high level)

**SCR — Scope Journey**

[Diagram showing the scope journey with steps such as Demand, Supply, Clean Dispatch, Dirty Dispatch, Process, Sterile Store, etc.]