Establishing Nurse-Led Intraoperative Cell Salvage (ICS) Service in SGm Major Operating Theatre (MOT)



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BACKGROUND & AIMS

What is Intraoperative Cell Salvage (ICS)?

 ICS is the process where patient's blood is collected, washed and processed for reinfusion in surgeries



Number of Red Cell Transfusions Per Unique Non-Cardiac Patient With Surgeries Done in MOT With Blood Loss \geq 500 ml and % Uptake of ICS Service

1 50			2107
4.50	PDSA 1: Start of ICS service for	PDSA 2: Service expanded	24.070
	selected elective surgeries during	24/7 for all MOT surgeries with	
4.00	working hours		

• This is an important component of perioperative blood conservation to reduce allogeneic blood transfusion and its associated complications, in turn improving patient outcomes and optimising national health care resources with finance cost savings

Impetus for Change in SGH

NHCS PERFUSIONIST AND EXTERNAL VENDOR LED ICS (OLD PROCESS)



•ICS service can only be used for elective surgery, as pre-arrangement is required ICS service availability depends on perfusionist's and vendor's availabilities External •External vendor is not medically trained and is not under governance and regulation of the hospital

ANAESTHETIC UNIT (AU) NURSE-LED ICS (NEW PROCESS)



Job re-engineering for AU nurses



Figure 3: Reduction in number of red cell transfusions per unique non-cardiac patient with increased uptake of ICS Service

Between April 2023 to February 2024, the AU nurse-led ICS service supported a total of 163 cases, leading to an increase in ICS uptake from 1.5% to 11.1% for major surgeries



•ICS service is made available **24/7** to all elective and emergency major surgeries in SGH MOT

 Improved patient safety and care quality with formalised staff training, standardisation, protocols and audit

Figure 1: Comparison of the old and new process for ICS service

METHODOLOGY

- The following steps were done to standardize the process, increase availability and increase awareness on importance of blood conservation and promote use of ICS in major surgeries (blood loss \geq 500 ml)
- This is led by a multidisciplinary team of nurses, anaesthesiologists, surgeons and haematologists.



- Number of allogeneic red cell transfusion per patient reduced by 19%, from 3.09 units to 2.51 units during stay
- Half of surgeries that utilised ICS service did not require allogeneic blood transfusion
- There was no reported 30-day ICS-related complications
- With the transition from vendor-led service to AU nurse-led service, the cost of the ICS service reduced by SGD\$2,614 per case
- With approximately 1500 major surgeries done in SGH annually, the total estimated annual cost avoidance through job re-engineering is SGD\$435,231 at median ICS uptake of 11.1%

CONCLUSION

- ICS is an integral component of patient blood management in major surgeries
- The establishment of the AU nurse-led ICS service with standardized protocol and a multi-disciplinary team to drive implementation resulted in increase of ICS uptake per unique patient from 1.5% to 11.1%, and improved the number of red cell transfusions per unique patient by

19% from 3.09 units to 2.51 units

National Heart Centre Singapo

Centre Singapore

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National Dental

Centre Singapore

National Cancer

Centre Singapore

- With the shift in service model, the estimated annual cost avoidance is SGD\$435,231
- Change management strategies such as robust training programmes, effective communication channels and support systems are integral to the success of the project

Singapore National

Eve Centre

• Job-re-engineering can help improve work efficiency, patient safety and reduce cost

National

Neuroscience Institute



Singapore General Hospital



Children's and Children's Hospita

Children's Hospital

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SingHealth

Community Hospitals

Polyclinics

Figure 2: Summary of the processes in PDSA 1 and PDSA 2

Sengkang General Hospital

Changi General Hospital