Maximum Surgical Blood Ordering Schedule (MSBOS)

Key Words: MSBOS, Maximum Surgical Blood Ordering Schedule, Inventory, Type and Screen

Expected Blood Management Deliverable

MSBOS Table of common elective surgeries, approved and implemented

Introduction

Both the MSBOS and the T&S protocol were originally developed to prevent needlessly tying units up in inventory for patients unlikely to need a transfusion. While blood is less scarce today, these protocols are still useful in ensuring laboratory testing and blood inventory are optimally utilized. The guidelines are not rigid and allow for a degree of flexibility.

Both protocols serve as entrée into blood management as they typically garner widespread support and allow committees, subcommittees, and work groups the opportunity to learn how to work together and develop a sense of camaraderie and a system-wide focus on patient safety. They can promote the proper internal hospital governance (committees, subcommittees, workgroups, planning tools, etc.) and relationships necessary for subsequent, more difficult, and complex projects.

Objectives of Module

1. **Discuss why a MSBOS is an important component of blood management**
2. **Describe how to develop a MSBOS**
3. **Discuss how implementation of MSBOS can create and enhance the institutional infrastructure and relationships needed to implement change including blood management projects.**
4. **Provide an example MSBOS document that can be utilized by hospitals to develop their own MSBOS protocols**

What is Known

The Maximum Surgical Blood Order Schedule (MSBOS) is a table of elective surgical procedures which lists the number of units of red cells routinely pre-operatively crossmatched and then transfused for each procedure. Like the type and screen, the goal of the MSBOS is to promote safe and effective use of blood by allowing more efficient use of blood inventories. It can simplify blood ordering practices by providing a standard order for most patients. As such, it is frequently a worthy first step to decreasing the crossmatch/transfusion ratio.

Best Practices, Guidelines, and Recommendations

The MSBOS along with a Type and Screen protocol provide improved transfusion service efficiency and improved patient care by reducing unnecessary laboratory testing and improving inventory management.

They are frequently non-contentious and widely endorsed so their establishment can serve as a platform for transfusion committees and process improvement initiatives to begin.

Discussion Points

MSBOS

A typical MSBOS consists of:

- A list of types of surgery correlated to the recommended number of donor units to be crossmatched for the elective surgery based on previous local practice and on broader standard of care data
- A system to promote communication between the blood bank and the physician to provide a documented rationale when ordering more blood than recommended

The likelihood of transfusion and probable blood use are derived by reviewing actual blood use over a suitable period of time (such as a year) for each surgical procedure. A proportion is established for each procedure as follows:

The institutional MSBOS for each procedure = the total # units transfused for the procedure per time period / the total # procedures for each procedure per time period

Steps to Implementation

- Identify and communicate need for MSBOS
- Create implementation plan
- Obtain authority to proceed
- Identify and recruit infrastructure and relationships needed to implement plan
- Implement plan, monitor impact
- Celebrate success
- Identify next project

Additional Resources

If you have questions, or if you need additional guidance, please contact your Blood System's team.

Several Optimum TX modules might interest the reader;

- Multidisciplinary teams
- Project Management
- How to implement change
- Type & Screen Protocol
- Example MSBOS (Presented below)

See Appendix: Sample MSBOS

References

British Committee for Standards in Haematology Blood Transfusion Task Force (1990) **Guidelines for implementation of a maximum surgical blood order schedule.** *Clinical and Laboratory Haematology* 12: 321-327.

Appendix

MSBOS Example

This is a list of the amount of blood that should routinely be ordered for each elective surgical procedures. The list may be modified based on specific patient situations. This allows an institution to minimize inventory, decrease outdates, and improve efficiency (decrease the C:T ratio). *The MSBOS should be approved by the transfusion review committee and involved medical staff*. Physicians that routinely exceed the MSBOS should be reviewed by the committee or peers to see if modification of the MSBOS or modification of physician practice is necessary. An example MSBOS, utilized by Rush University Forrest General Hospital, is presented on the next few pages.

CARDIOVASCULAR-THORACIC SURGERY	
AICD	TS
Aortic bifurcation graft (aneurysm or aortobifemoral graft)	2
Axillary femoral, axillary bifemoral bypass	TS
CABG	2
CABG redo	4
Carotid endarterectomy	TS
Closed pediatric heart surgery	1
Congenital heart surgery	3
Femoral popliteal bypass	TS
Mitral or aortic valve replacement	2
Mitral or aortic valve replacement redo	4
Pacemaker implantation	TS
Thoracic aortic aneurysm resection	4
Vein ligation	TS

ENT	
Arytenoidectomy	
Cleft lip or palate repair	TS
Excision, branchial cleft, or thyroglossal duct cyst	TS
Excision nasopharyngeal angiofibroma	TS
Exploration of laryngeal fracture	4
External ethmoidectomy	TS
Hemilaryngectomy or total laryngectomy	TS
Lateral rhinotomy	TS
Major temporomandibular arthrotomy	1
Maxillary or mandibular osteotomy, fracture repair or reconstruction	2
Neck dissection (all types)	2
Osteoplastic frontal sinusectomy	TS
Partial glossectomy	TS
Partial maxillectomy	2
Partial parotidectomy	1
Radical maxillectomy	TS
Submaxillary gland excision	2
Submucous resection, septoplasty	TS
Supraglottic laryngectomy and radical neck dissection	TS
Temporomandibular arthroscopy/arthrotomy	2
Thyroidectomy	TS
Thyrotomy (laryngofissure)	TS
Total laryngectomy and radical neck dissection	TS
Total parotidectomy	2
Tracheostomy	TS

GENERAL SURGERY	
Abdominal lipectomy	TS
Abdominoperineal resection	3
Adrenalectomy	2
Appendectomy	TS
Augmentation mammoplasty	-
Axillary or groin dissection	TS
Cadaver renal transplant	TS
Cholecystectomy with/without CD exploration	TS
Colostomy or colostomy closure	TS
Colon resection	2
Common duct revision or reconstruction	2
Construction of ileal pouch/ileoanal reconstruction	3
Cutaneous or myocutaneous flap	TS
Esophageal diverticulectomy	TS
Excision, branchial cleft, or thyroglossal duct cyst	TS
Excision retroperitoneal mass	2
Exploratory laparotomy, emergency	2
Gastric resection	2
Hemorrhoidectomy	TS
Hepatic resection	4
Hernia repair	-
Live donor nephrectomy	TS
Liver transplant	20
Major pancreatic resection	4
Mastectomy	TS
Muscle group excision	2
Neck dissection (all types)	TS
Operations for GE reflux	TS
Pancreatic drainage procedure	2
Parathyroidectomy	TS
Partial glossectomy	2
Partial parotidectomy	TS
Pelvic node dissection	2
Polypectomy (open), benign tumor	TS
Rectal procedures	-
Reduction mammoplasty, mastoplexy, or breast reconstruction	TS
Skin graft	TS
Small bowel resection	TS
Sphincteroplasty	2
Splenectomy	TS
Submaxillary gland excision	TS

Total parotidectomy	TS
Throidectomy	TS
Vagotomy and drainage	TS
Wide excision of skin and soft tissue	TS

NEUROSURGERY	
Adult craniotomy (tumor/aneurysm/AVM/seizure/abscess)	4
Aneurysm and arteriovenous malformation repair	2
Anterior cervical fusion/excision of lumbar disc	TS
Any major craniotomy or laminextomy in a child <5 years	4
Burr holes for subdural hematoma	2
Cranioplasty or craniosynostosis repair	4
Craniotomy for subdural hematoma	2
Depressive lumbar/cervical larninectomy	2
Excision of brain or spinal cord tumor, primary or metastatic	2
Peripheral nerve repair	TS
Transphenoidal hypophysectomy	2
Temporal bone resection	3
Ventriculoperitoneal shunt (shunt placement) (child)	TS

OBSTETRICS/GYNECOLOGY	
Cervical conization	-
Cesarean section (uncomplicated)	TS
Cystectomy - ovarian	TS
D & C	-
Exploration for ovarian cancer	2
Exploratory laparotomy - emergency	2
Laparoscopy diagnostic	TS
Laparoscopy operative	TS
Local perineal procedures	TS
Pelvic exoneration	4
Radical hysterectomy	2
Stress urinary incontinence repair	TS
TAH with/without BSO	TS
Tubal ligation	-
Uterine myomectomy	TS
Vaginal hysterectomy	TS
Vulvectomy	2

OPHTHALMOLOGY	

ORTHOPEDICS	
All foot surgery	TS
All hand surgery	TS
Amputation above or below elbow	TS
Amputation, disarticulation or forequarter	4
Arthroscopy or arthroscopic surgery	-
Ender nail-up or femur	TS
Forearm operations	2
Hindquarter amputations	4
Humerus, open reduction or excision of a bony lesion or bone graft	2
Intravertebral disc excision	2
Knee ligament reconstruction	TS
Lower extremity amputations	TS
Open reduction, ankle or tibia	TS
Open reduction, femur or intertrochanteric fracture	2
Replacement, femoral head or total hip	2
Revision total hip arthroplasty	4
Shoulder reconstruction	2
Spinal arthrodesis with instrumentation for scoliosis	4
Spinal fusion, lumbar	2
Total knee replacement	2

PLASTIC SURGERY	
Abdominal lipectomy	TS
Augmentation mammoplasty	-
Cleft lip or palate repair	TS
Cutaneous or myocutaneous flap	TS
Debridement and closure of pressure (muscle group excision)	2
Facelift	TS
Free flap	2
Major craniofacial reconstruction or fracture repair	4
Reduction mammoplasty, mastoplexy, or breast reconstruction	TS
Rhinoplasty	TS
Skin graft	TS

Orbital exoneration	-	Wide excision of skin and soft tissue	TS
		UROLOGY	
		Cystectomy	2
		Excision scrotum (complete or partial)	TS
		Nephrectomy	2
		Orchiectomy	TS
Source: Rush University Forrest General		Prostatectomy (open)	2
		Transurethral resection, prostate or bladder	TS
# units crossmatched, TS= type and screen, "-"= no TS or crossmatch		Urethroplasty	TS
		Urinary diversion	2