

NYU Langone Quantitative Blood Loss Initiative

Introduction

The NYU neurosurgery team has developed a functional and accurate method to quantify blood loss intraoperatively. The surgeries conducted on this neurosurgical unit are particularly complicated, lengthy, and accrue high volumes of blood loss due to the nature of brain/spine surgery. Our process evolved from the workflow of weighing blood saturated surgical items in Labor & Delivery C-section procedures to then include the various surgical items to be weighed, multiple canisters where blood/irrigation is suctioned, tubing, Cell Saver Perfusion involvement, etc. After collecting anonymous estimated blood loss predictions from surgeons, surgical residents, anesthesiologists and nursing - it was clear that estimated blood loss (EBL) greatly varies between roles in the operating room.

Intraoperative QBL Process Development

Audit Process

An auditing process is utilized to determine outliers and remove discrepancies from our completed cases (Examples: suction failure, fluid spill, cell saver volume discrepancy, etc) Our primary audit tool uses the patients % drop in CBC hemoglobin from baseline pre-op to immediately post-op. We take into account the patients total body blood volume based on gender and age

CBC Hemoglobin Audit Formula:

Baseline Hgb – Immediate Post-Op Hgb = % drop in Hgb
% drop in Hgb x Patient Blood Vol (weight in Kg x mL amount related to age & gender) = QBL
We later added a hemodilution audit tool to increase accuracy further to include IV fluid/ intraoperative transfusion impact on patients intraoperative hemoglobin

The RN's manually attest to QBL accuracy in a comment box on the spreadsheet:

List miscellaneous items below and their QBL:	Do you feel this QBL is accurate?
	Enter comments below:

Further Streamlining

Formation of Real-time QBL Process:

We pre-determined "soaked" prep towel weight for specific cases in which the surgical area is draped with blood/irrigation soaked towels that cannot be weighed in real-time
We also measured the height of irrigation using the sterile ruler on the field in the fluid warmer so it can be included in the real-time calculation (2.2cm=500cc fluid)
Additions to Improve Accuracy:
Calculation of irrigation lost in all surgical tubing utilized
Process formed to determine blood loss with Cell Saver volumes during case

Results/Findings

Our method of calculating intraoperative quantitative blood loss is an accurate and consistent method of assessing blood loss in real time

Calculating QBL has become the permanent workflow of our OR nursing staff which has led to an increased awareness of surgical blood loss & the access to a reliable tool to make educated decisions on transfusion necessity

Our process of intraoperative QBL has given the perioperative nursing team an intimate role in proactive resuscitation management and formed a collaborative effort with anesthesia in the OR. This practice has ultimately improved patient outcomes by improving intraoperative resuscitation therefore decreasing ICU length of stay and need for post-operative resuscitation.

Early Stages

- All surgical items individually weighed to determine dry weight
- All sources of irrigation/suction fluid/ volume in tubing/aspirate on & off sterile field accounted for
- Inservice for RN's conducted and new information gathered daily to increase accuracy & streamline process

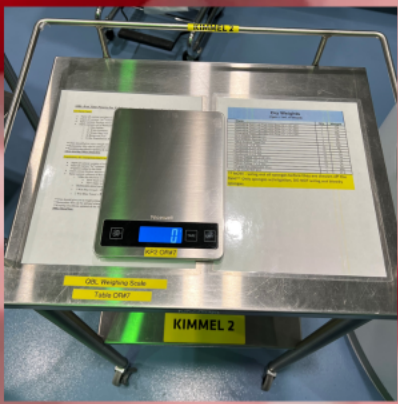
Intraoperative Transfusion/Verbal Call Outs

After approximately 9 months of regularly calculating QBL and comparing post-op resuscitation, it was determined a transfusion is likely necessary if the patients real-time QBL is 1000mL or greater

When calculating real time intraoperative QBL, the OR circulator will alert anesthesia and the surgical team at every 500mL blood loss interval in order to prepare for transfusion needs and to keep the entire surgical team informed & involved in resuscitation actions

Time when Team was Notification	QBL (Real Time)	Blood Given?
0:00		
0:00		
0:00		
0:00		
0:00		

QBL dedicated scales in OR:
Utilized as a weighing station for surgical items with real-time QBL instructions



QBL Method

Formation of an "all in & all out" method of computing QBL:

Weigh all used surgical items on a scale regardless of "bloodiness" and subtract the dry weight from weighed numbers

Then compute/track the starting amount of irrigation given to the field, add in the wet weight of surgical items, and quantify the volume of fluid left on the field to ultimately calculate the QBL

(All Out - All In = QBL)

Intraoperative QBL Calculator

Formation of a shared excel spreadsheet with embedded formulas to measure the fluid volumes & surgical items subtracting dry weights and ultimately calculate QBL

Individualized templates emailed to RN's daily to utilize as a working spreadsheet throughout surgery

Spreadsheet access given to all circulators involved in the procedures to continue the QBL calculations throughout relief and change of shift

Date: _____			
Surgeon: _____			
MRN: _____			
IN			
Starting Volume (in mL)			
Irrigation poured on back table	Sonopet	Cell Saver:	
Aquamantys	CUSA	Heparinized Saline	
Misonix	Shaver/ Microdebrider	Wash Solution	
Irrigating Bipolar	Stryker Drill		
Endoscope/Clarus	Pulse Evac	Total Starting (mL)	0
OUT			
Amount Suctioned (in mL)			
Top Canister	Bottom Canister		
Total Suctioned			0
Remaining Volume at End			
Irrigation left on back table	Sonopet (bag + canister)	Cell Saver:	
Aquamantys	CUSA (bag + canister)	Heparinized Saline	
Misonix	Shaver/ Microdebrider	Wash Solution	
Irrigating Bipolar	Stryker Drill	Waste Bag Volume	
Endoscope/Clarus	Pulse Evac	Reservoir Volume	
Tubing	Type misc. item here	Re-transfusion Bag	
Total Remaining (mL)			0
QBL of Surgical Items			
Item	Qty Weighed	Qty EZ Bags	Total Wet Weight
Total QBL Items			0
If CIP leak, add "200" mL here ->			0
TOTAL QBL			0
Time when Team was Notification			
0:00	QBL (Real Time)	Blood Given?	
0:00			
0:00			
0:00			
0:00			
List miscellaneous items below and their QBL:			
Do you feel this QBL is accurate?			
Enter comments below:			

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