

Reusable Anesthesia Breathing Circuits

Opportunity

Implementation of reusable anesthesia breathing circuits is a feasible way to reduce waste per case and permit a stable inventory of anesthesia breathing circuits in the event of supply chain issues that can occur with disposable varieties. The anesthesia breathing circuit tubing, reservoir bag, and Y-piece can be reused and reprocessed safely within the hospital. North York General Hospital has successfully maintained the reusable anesthesia breathing circuit system for almost 20 years.

Benefits

Reduce waste per case in disposal of anesthesia breathing circuit, reservoir bags, Y-pieces. The lifespan of the anesthesia breathing circuit is approximately 1 year that would eliminate ongoing costs of equivalent materials in disposable form. The reusable circuit system reduces institutional vulnerability to supply chain issues that can occur with single use/disposable systems.

Solution

- Acquire Smooth-Bor anesthesia respiratory tubing, neoprene reservoir bag, reusable plastic Y pieces, +/- facemask.
- Implement a robust system with MDRD/CPD, perioperative staff for cleaning/processing, reassembly, and daily rotations on anesthesia gas machine.
- The system at NYGH does require some ongoing disposables: HME filter, adult anesthesia face mask (pediatric face masks are reusable masks)

Process

- Anesthesia Circuits changed daily before OR start by anesthesia tech / anesthesia assistant prior to machine check
- Disposable anesthesia adult face mask and HME filter changed per case
- Average lifespan of tubing approximately 12 months
- “Dirty” Anesthesia circuits send to CPD for reprocessing – dismantled and sorted in specific washing apparatus and programmed wash/rinse sequence
- Circuit components separated and placed on washing apparatus in designated areas
- Breathing circuits pasteurized automatically in washer disinfectors at 160 deg. F under preset program
- Hang dry circuit pieces in designated anesthesia dryers by component parts

- Assemble circuits for anesthetic gas machines when dry



CPD System



Component specific washing apparatus





Programmed washer disinfector



Dryers for component parts



Assembled clean circuits

Circuit component	Image
<ul style="list-style-type: none"> • Smooth Bor Tubing 22mm cuff diameter, 60in and 40in lengths, <ul style="list-style-type: none"> ○ Canadian Hospital, Cat # SB-403-60 	
<ul style="list-style-type: none"> • Reusable Y-Connectors <ul style="list-style-type: none"> ○ Canadian Hospital, Cat # 60-11-400 	

- Teleflex 2L, 1L reusable neoprene pecan shaped reservoir bag with 22mm neck insert
 - Cat#22170AP / 22175AP



History of implementation

Institutional knowledge indicates reusable circuits were in use at NYGH since the early 2000s, originally intended to reduce storage volume requirements of disposable items in the OR core. In 2017-2018 organization implemented the CDS Modules (OR On time delivery of Custom packs ready made for case picking). In these modules single use Anesthesia Equipment (Breathing bags, Circuits and Masks) were introduced. With NYGH feedback and preference to continue with reusable materials, Medline removed single use breathing circuits from the modules except for the HME filter and disposable adult face mask.

Anticipated Challenges

- Initial purchase cost
- Acquisition of component specific washer, processing equipment, development of processing protocol in CPD
- Training of personnel to recognize equipment and component parts to avoid loss / accidental disposal

Resources

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