

As part of our May story on preventing toxic anterior segment syndrome (TASS), we invited surgical facilities that host eye cases to share with us the one strategy that their facility relies on to prevent a TASS outbreak. Here are all 159 responses we received. As you'll see, there are as many ways to prevent TASS as there are suspected causes of it.

1. We do not use reusable tubing.
2. Vigorous flushing of phaco and I/A handpieces and cannulas with the QuickRinse System.
3. No detergent on cataract instruments
4. ultrasonic cleaning of instruments is done with distilled water only. no enzymatic solutions are used.
5. single use
6. Meticulous cleaning by CRCST trained technicians. Written policies and procedures for cleaning that are updated frequently. Utilize "flash pans" that are made specifically for "short cycle" sterilization. Cannulated instruments do not go in the ultrasonic bath...which contain detergent. We rinse and then rinse again....all instruments. We do use reusable cannulas but never visco cannulas. Disposable phaco tubing only. We blow out all cannulated instruments with pressurized air after thorough cleaning with distilled or sterile water. Shortcuts are never allowed in the cleaning/sterilizing department.
7. immaculate cleaning
8. We believe it takes more than one strategy. No use of detergents to avoid buildup in lumens. Enzymatic & all detergents labeled "NOT FOR OPHTHALMOLOGY USE". For intraocular use - only preservative free meds. Flushing all lumens w/ 120ml of sterile water followed by 60ml air. US cleaning in sterile water only. Ophth. dedicated US machine cleaned w/ alcohol & rinsed w/ sterile water after each 4 cases and at end of day & wiped dry. Use disposable cannulas only. Surgeons have been educated on avoiding use of pre-op topical anesthetic gels or jelly and post-op eye drops and ointments w/ preservatives that could seep into the wound.
9. Try to ensure that our instruments are cleaned and sterilized in appropriate fashion.
10. Strategic Infection Control techniques are mandatory for eye procedures. Staff training and education is the basis for TASS prevention. Starting from medication (eye drop) administration, prep techniques, instrument sterilization, to procedure techniques aid in TASS prevention.
11. No enzymatic cleaners on cannulated instruments
12. Use disposable cannulas
13. saline irrigation of phaco handpieces as soon as possible at conclusion of its utilization even as case proceeds and once again before sterilization. I/A handpiece irrigated immediately at conclusion of case and also once again.
14. prevention and thorough cleaning

15. use of quickrinse automated instrument rinse - remove the human element and provide a consistent process to eliminate possible causes.
16. Utilizing strict cleaning, sterilizing processes on all instrumentation and assuring staff, physicians and allied healthcare performing eye surgeries, are trained in processes to prevent TASS as well as provide any new data related to TASS, facility-wide.
17. We bought a flushing device that flushes the hand pieces with pressure. We used to manually flush and now use the machine, perhaps it helps take the build up off the hand pieces looking back, we had the same methodology for years without any issues. Then across the country, TASS started to pop up. It was sporadic and came in groups. Everyone was forced to changes processes, buy new equipment etc. and then TASS went away, kind of suddenly. My question remains: It appeared sporadically across the country, suddenly. Many places had been doing the same thing for years - what caused those processes to be faulty now. Was it indeed product related and which product, I don't know - but I do believe it was the result of some product.
18. Use of sterile water for high speed irrigation of any lumen containing instrument i.e. phacoemulsification handpiece, and strict use of disposable cannulas
19. Good sterilization techniques. Avoiding chemical sterilization.
20. Irrigating cannulas, I & A handpieces, Phaco handpieces with 20+ cc of sterile water after ultrasounding the instruments.
21. Flushing each lumen with sterile water after cleaning before sterilization
22. good cleaning and rinsing of instruments
23. Drains water from portable sterilizers after each day's use thus eliminating the endotoxins that may exist after sterilization of instruments.
24. single-use items, extremely thorough cleaning
25. Meticulous cleaning of lumenated items. Rinsing well with distilled water.
26. Strict adherence to cleaning, processing and sterilization of instruments.
27. Continuing education with all staff that perform these duties.
28. washing/rinsing instruments with distilled water only
29. Appropriate decontamination and rinsing of all substances from instrumentation (flush, flush, flush)
30. Disposable cannulated items, thorough decontamination, cleaning and sterilization of instruments.
31. Our Center had a severe outbreak about 15 months ago. We ended up sending 10 affected patient records to the University of Utah. We followed every one of their suggestions and the

TASS outbreak disappeared. Some of the suggestions we followed were to discontinue the use of the ultrasonic cleaner all together. We purchased a flush machine and started using only distilled water in instrument cleaning. We started using sterile water on the back table to immediately place our tips and cannulas in to prevent the viscoelastic from hardening. We also stopped using the epinephrine with the preservative and went preservative free. We use only disposable 30g cannulas now. The Dr. did use vancomycin intra-operatively for a short time but when it was d/c'd there was no change in the positive outcomes. We haven't had a TASS occur since the changes were made.

32. Strict observation and adherence to asepsis; proper instrument cleaning; monitoring
33. strict monitoring of sterilization/cleaning procedures
34. We use the Autorinse System that automatically irrigates the handpiece / cannula with 120 cc of distilled water. That way we know that the items have been irrigated with the volume of water recommended by the manufacturer of our handpieces.
35. Clean and rinse all ophthalmic instruments with distilled water. Do not use any detergents for cleaning intraocular instruments
36. CSD decons all instruments. We flush all instruments on the field before sending to CSD. Powder free gloves. Preservative-free meds. Use of filter needles.
37. Use high powered rinsing with sterile water
38. Use only single use cannulas and tubing.
39. follow protocols to the letter
40. No reusable cannulas
We DO NOT reuse phaco tips
All intraocular medications are preservative free.
41. Extreme care in cleaning and rinsing of lens injector; extreme care in flush of handpieces (I/A and Phaco) with mineral free, purified water; no reusable cannulas
42. meticulous cleaning and rinsing
Avoiding production pressure on instrument processing
43. No use of ultrasonic baths
44. Do not use any chemicals on the eye instruments.
45. Bought extra instruments to prevent flashing
46. ultrasonic, thorough rinsing and flushing of annulated instruments 47.
47. Strict adherence to proper cleaning and sterilization of instruments along with using single use disposable cannulas only for every case - no reusable cannulas.

48. We adhere to very strict decontamination and sterilization techniques through our policy and procedures. We leave no room for error as this is the core of our surgery center.
49. cleaning, flushing and ultrasounding of instruments immediately after the procedure (and not using enzyme detergents)
50. 3 fresh water instrument rinses, the last rinse, distilled water is used. Our sterilizer uses only distilled water.
51. Removed cleaning/disinfection of all ophthalmic instruments including phaco handpieces from OR and had CS perform.
52. Flushing cannulas per AORN guidelines, Use of mechanical distilled water/air irrigating system and changing distilled flush water every 4 cases.
53. Standardized decontamination that includes: manual cleaning followed by ultrasonic with irrigation, then 3 separate rinses with the last being distilled or sterile water. We use purified steam, and RO filtered water. We have no lint and use forced air to dry.
54. We discontinued using reusable 27 g cannulas
We also focus on rinsing the Phaco and I+A handpieces immediately after use, by the surgeon stepping on the pedal. We also flush it with deionized water using the Quick rinse to ensure adequate flushing.
55. We have switched to using disposable cannulas.
56. we no longer mix medications together. we also changed our cleaning, ultrasound & sterilization process.
57. Eye instruments hand processed by trained technicians
58. Instruments are thoroughly rinsed on the field after the case with sterile water.
59. Proper processing of all instrumentation used for eye surgeries.
60. Meticulous cleaning of all instruments, with special emphasis on cannulated instruments, at least 120 cc of sterile water flushed thru every hole.
61. Flush instruments with sterile water after case.
62. Following recommendations to the letter for cleaning even though it does take longer
63. Rinse Rinse Rinse
64. Meticulous rinsing of all instruments immediately after surgery on back table followed by thorough cleaning by hand and ultrasonically. We also never flash instruments they always go through a full Pre-Vac cycle.
65. We do not reuse cannulas

66. Sterilization and biological monitoring done every day. Try to use sterilized instruments rather than flashed for all procedures. Set duration time for leaving anything open on the field. Pre soak for all eye instruments, including cannulas with viscoelastic. We also changed products.

67. We do not use enzymatic cleaners any longer.

We have had several clusters of TASS, always when new model of Alcon IOL introduced and used, especially the RESTOR. We have never had a TASS case with any IOL but Alcon's, the most infrequently used manufacturer of IOLs used in our facility (4000 annual cataract surgeries).

68. Following the American Society of Cataract & Refractive Surgeons, AAMI and AORN recommendations.

69. we do not use any enzyme cleaners on eye instruments. We use only sterile water.

70. Changed how we cleaned our diamond blades

Changed our surgical gloves

Took methylene blue out of the OR (can be confused with trypan blue)

Pressure wash all cannulas

71. We have enough instrument sets to properly clean and sterilize between patient use. We do not flash.

72. Utilization of Certified Instrument techs with wrapped sterilization

73. use disposable cannulas

74. Using no detergents to clean surgical instruments.

75. Fired employee

76. No reusable cannulas and maintaining cleaning/sterilization processes consistent with manufacturer guidelines.

77. Adequate careful cleaning & sterilization of all ophthalmic instruments esp meticulous cleaning & flushing of non-disp cannulas & channels

78. Single use of eye gtts. Each patient has his/her own.

Do not prepare the BSS solution until it is needed.

Service does their own prep.

79. Hand washes all eye instruments and uses distilled sterile water for rinsing of Eye instruments. No enzymatic cleaning agents used when cleaning instruments

80. We no longer use ultrasound and enzyme cleaners to decontaminate our surgical instruments in-between cases. We use the ultrasound with enzyme and milk bath instruments on a monthly basis when there is more time to do it correctly and when we are not in a hurry, so that the instruments are properly rinsed of any residual chemicals.

All BSS is allowed to warm up to room temperature before use in surgery.

We use a 50/50 dilution of betadine 10% drop in the eye before the eye prep, and post procedure.

81. Strict adherence to manufacturer's guidelines for sterilizing instruments

82. copious rinsing with deionized water
correct dilution of cleaning and disinfecting agents

83. We have had only one or two cases. We have been open for 12 plus years. Currently we do about 400-500 ophthalmologic cases per month: retina and cataracts in a 4-OR ASC.

84. Purchasing enough instrumentation to be able to have terminally sterilized sets for every eye case scheduled.

85. We have several surgery centers that our surgeons rotate between. Fortunately we have very few TASS episodes but when they occur, we search for any common causes between the cases. Is it a particular surgeon, IOL, phako unit or hand piece? Is it confined to a particular center on a particular date, if so what techs were working that date. On one occasion we tracked it down to a specific autoclave that upon inspection was found to be malfunctioning. Once it was repaired we had no more TASS issues.

86. Thorough cleaning of instrumentation

87. Having a Certified SPD Technician who thoroughly understands the importance of following a strict regime for cleaning and decontamination of instrumentation and the proper concentrations, dilution, flushing, and timing of the entire process.

88. meticulous cleaning of instruments, flushing hollow bore out

89. research of evidence-based practice and research national leaders and experts in the field

90. We have been blessed with no TASS outbreaks, so I can not answer these questions.

91. We changed how we processed our instruments. We purchased a ultrasonic cleaner, and it is only used on our eye instruments. in addition we changed to preservative-free BSS

92. We do not use reusable cannulas. We also switched to preservative-free solutions.

93. After decontamination all of our eye trays/instruments are wrapped and go through a full cycle of steam sterilization and we never have any flash sterilization of these inst.

94. We do up to 27 cases a day so it is very important to inspect the injectors for residual viscoelastic that might be present on the plunger. If we see any, we open a new one.

95. We try to do everything "by the book". Do not wash instruments with any detergent, change water in ultrasonic, irrigate cannulas like crazy, etc. But honestly, I have heard of other centers doing the same who have had a TASS outbreak so I consider us very blessed indeed! I do read everything that comes along about TASS and what they are finding and try to match our practices to what the experts (Mamalis, et al) are saying.

96. Use of detergent in ultrasonic washer to clean instruments with copious amounts of rinsing.
97. Prophylactic use of topical antibiotics 2 days prior and 9 days post operative.
98. Non enzymatic detergent to clean eye instruments
99. Cleaning and sterilization procedures in accordance with manufacturer and AORN, AAMI guidelines
100. We strive to acquire continuous and up to date research in our infection control program and using the latest recommendations and guidelines for our specialty (ophthalmology). Also, all of our intraocular medications and anesthetic medications used for eye "blocks" are preservative free. We have also incorporated the specialty recommended practices of manually cleaning our instruments with deionized water and designating a sink that is only for cleaning ophthalmology instruments. Additionally, we choose not to risk residue of enzymatic cleaner by eliminating its use in the cleaning process all together. There is evidence that endotoxins are formed if enzymatic detergent is not properly rinsed from the instruments which in turn, causes TASS. The rinsing process is not an exact science and the detergent can burrow itself into a crevice in the stainless steel of the instrument, this is not visible to the naked eye, therefore knowing that an instrument is properly rinsed is a variable that we are not willing to risk.
101. Purchased larger ultrasonic machine, use disposable irrigation tips and implemented a double rinse with sterile water after cleaning.
102. Following occurrence of several cases of TASS identified at one facility that occurred on the same day we worked with consultants from ALCON and Intermountain Ocular Research Center, Salt Lake City, UT and developed a TASS best practices clinical pathway for ophthalmology surgery that we shared with all of our ambulatory surgery centers. RCA identified several possible contributory causes to include (1) staff education on sterilization processes (2) instrumentation sterilized in a new flash pak that staff were trialing, lack of familiarity with new equipment (3) Reuse of single use medication ampules between cases (4) use of enzymatic detergent in cleaning and decontamination (5) re-sterilization of plastic sleeves that are designed for single use (6) Concern that water studies conducted after event showed high copper levels present and heavy metals are known to cause TASS
103. The proper cleaning and sterilization of the instruments and hand pieces.
104. Wipe each instrument with an instrument wipe and sterile water after each use during the case.
105. Washing all instruments by hand with hydrogen peroxide and drying them thoroughly. Blowing out all cannulated instruments. Terminally sterilizing all instruments for each case and supplying adequate staff to turn over instruments after each case.
106. automatic irrigator for handpieces
disp cannulas
107. Using IFU from the instrument company. Rinsing all cleaning solutions with sterile water. Using disposable tubing where possible. Disposing of cleaning solution from ultrasonic cleaners

when used. Having key, select, trained dedicated Central Service Workers to process eye instruments.

108. Rigorous decontamination of instruments with lots or rinsing

109. Multiple instrument rinse baths using distilled water and multiple irrigation of PHACO handpieces with QuickRinse device using distilled water.

110. Maintaining pristine flushing and cleaning of the instruments and paying attention to the detail with these items

111. Surgeons who brought their own instruments would wash them in the OR and then flash them for the next procedure. Now, we insist the instruments are taken to decontam and thoroughly washed. We then rinse everything with sterile water. In the past, we rinsed with tap water.

112. Following manufacturer's recommendations for flushing instruments with cannulas, and changing to only water. Nothing else.

113. Preservative free medications and no enzymatic cleaners used.

114. Disposable cannulas

115. minimal to no flashing of instruments

116. Proper cleaning and sterilization of instrumentation

117. Continuous education of staff on proper instrument cleaning and sterilization procedures.

118. Rinsing and irrigating instruments with distilled water and use of BSS plus

119. Emptying of sterilizer nightly. Instruments are terminally cleaned immediately after each case.

120. use of disposable blades

121. Thorough cleaning in sonic of any residual viscoelastic

122. We use a consistent process for cleaning and decontamination of eye instruments and use disposables when possible.

123. Stopped using reusable cannulas, at end of each case started using fresh pH neutral Enzyme detergent w/triple distilled H₂O rinse and alcohol rinse on all cannulated instruments w/triple rinse distilled H₂O ie: I&A handpiece, tips

124. Continue to process the instruments in the same manner we always do using a standardized process. We also use the same reliable vendors for supply purchases. TASS, I believe is caused through some kind of change in the supply chain combined with surgeon technique. When an outbreak occurs, why do to some surgeons have no TASS at all while others have multiple episodes on different surgical days. Thank goodness this issue does not present itself very often.

125. Instances of TASS have been rare and isolated. Thus I concluded it could be related to our instrument processing. We frequently evaluate our processes.

126. We use an automated pump to irrigate our cannulas, in addition we use distilled water for the final rinse.

127. Eye instruments are decontaminated in an ultrasonic (only used for eye instrum.), no detergent is used.

128. Copious flushing and suctioning the cannula dry

129. Proper cleaning of equipment and instruments in between cases

130. Very strict sterilization techniques along with strict aseptic technique

131. We do not use detergent on our instruments

132. Blow out cannulas with air
Special attention to cleaning any cannulas

133. Dedicated sonic washer with solution change after each use. Eye instruments are washed only with other eye instruments.

134. Proper flushing of surgical instrument lumens with properly trained staff to and include this process as part of their annual skills check off. Use of automated eye surgical instrument washers.

135. We do not use detergent on the instruments in order to prevent foreign agents left on the instruments and then sterilized. We also use an ultrasonic machine to clean instruments thoroughly.

136. Great surgeons, superior technique & sterilization quality.

137. Following instrument manufacturer's cleaning and sterilization guidelines.

138. We clean our instruments throughout the day as they are being used and then at the very end of the day, we do a more intense cleaning before autoclaving

139. this survey caused me to look up what TASS is, and I have not finished reading the literature that I have found to learn from (in the OutPt Surgery magazine archives. I am new at supervising in an outpt facility that does eye surgeries to I have no other experience or input at this time.

140. We purchased Quik-rinse which we think definitely helps to clean out tubings and cannulas. We no longer put detergent in ultrasound baths.

141. disposable I/A tips

142. As recommended, we flush each port of the handpiece and I&A handpiece with 120 cc of distilled water after the procedure and blow them out with compressed air.
143. Make sure everything is sterile
144. Strict adherence to decontamination process
145. We now have a dedicated cleaning person who uses plumbed deionized water.
146. Education of staff.
147. 4-step cleaning process before sterilization
148. Rinsing all cannulas, I/A handpieces and Phaco handpieces with Quick rinse between each case. At the time of our outbreak we had recently changed our sterile gloves manufacturer. Once we changed back, TASS was no longer a problem.
149. Dedication to the cleaning and sterilizing process, pay extreme attention to those cleaning details.
150. water filtration system that reduces the amount of impurities in incoming water supply.
151. use of disposable cannulas as much as possible
152. We do not flash sterile any instrumentation
153. New phaco tip each case, no reuse of disposable items unless they are sent to an FDA approved reprocessor
154. Standardized flushing of the IA tips after the case, and the cleaning of the instruments with US cleaner. In addition, began to quality test the US cleaner with TOSI tests to be able to document the functionality of the machine.
155. Thorough rinsing and cleaning of the instrumentation prior to the sterilization process
156. after items go through washer/sterilizer they are rinsed with sterile water which contains no endotoxins. We also went to disposable cannulas.
157. Disposable cannulas; all single-use phaco tips
158. The quality of cleaning the instruments
159. proper sterilization of instruments and preparation of patient.