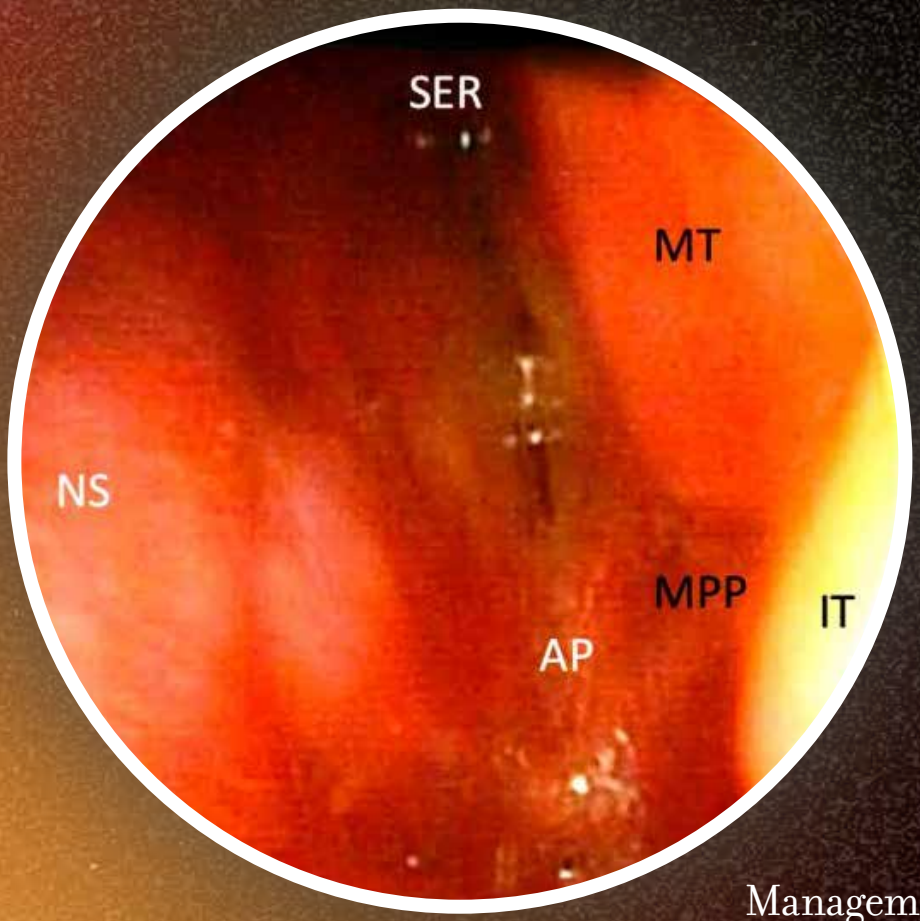
DECEMBER 2024 THE VOLUME 56 NO 12

THE SURGICAL TECHNOLOGIST

OFFICIAL JOURNAL OF THE ASSOCIATION OF SURGICAL TECHNOLOGISTS, INC.



Management of Choanal Atresia: National Recommendations With a Comprehensive Literature Review

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STATEMENT OF EDITORIAL PURPOSE The purpose of the *Journal* is to advance the quality of surgical patient care by providing a forum for the exchange of knowledge in surgical technology and by promoting a high standard of surgical technology performance.

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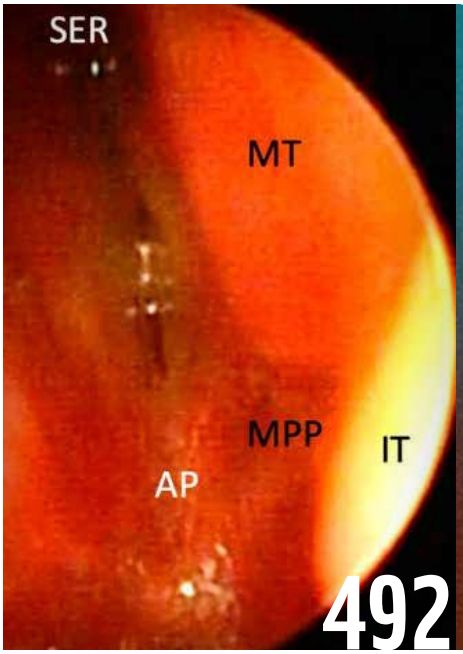


Management of Choanal Atresia: National Recommendations with a Comprehensive Literature Review

JURE URBANCIC, ET AL

Choanal atresia is the most common congenital anatomical abnormality of the nasal cavities, manifested with a clinical picture of neonatal respiratory distress. The treatment requires interdisciplinary management based mainly on tertiary referral center experiences.

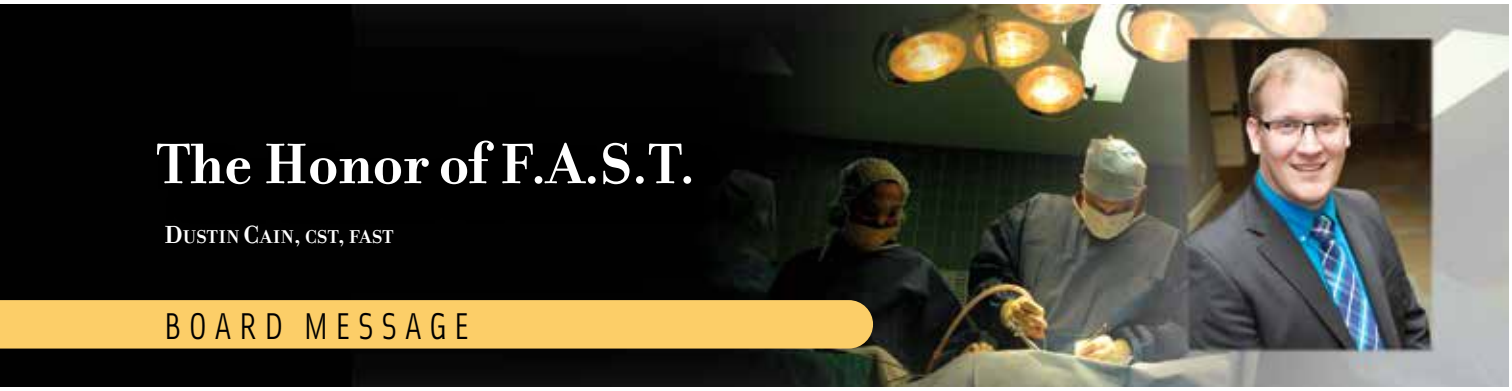
In This Issue

In Every Issue

The Honor of F.A.S.T.

Dustin Cain, CST, FAST

BOARD MESSAGE



In 2006, the FAST award was created to recognize surgical technologists who have achieved the highest professional standards, whose professional activities have been devoted to the practice of surgical technology, and to those who abide by the AST Code of Ethics and standards of practice. FAST recipients receive the gold pin that symbolizes the award as well as qualifying them to put FAST behind their credentials. I earned the prestigious award in 2019. To me, it was the highest honor I could receive as a surgical technologist. It means that I have devoted my career to our profession and will continue to uphold the highest standards as a CST. I wear my FAST pin and credential proudly.

April 15th of every year is the deadline to submit your FAST application. To qualify, a surgical technologist must meet the following criteria:

- Current active membership status of AST.
- Currently certified by the NBSTSA.
- No recorded violations of the AST Professional Code of Conduct.
- Applicant must make full disclosure of any felony conviction(s) in the application.
- No professional disciplinary actions recorded by the AST, the NBSTSA, state or provincial licensing or registration authority.
- Maintained AST active membership status for a minimum of six consecutive, uninterrupted years at the time the F.A.S.T. application is submitted.
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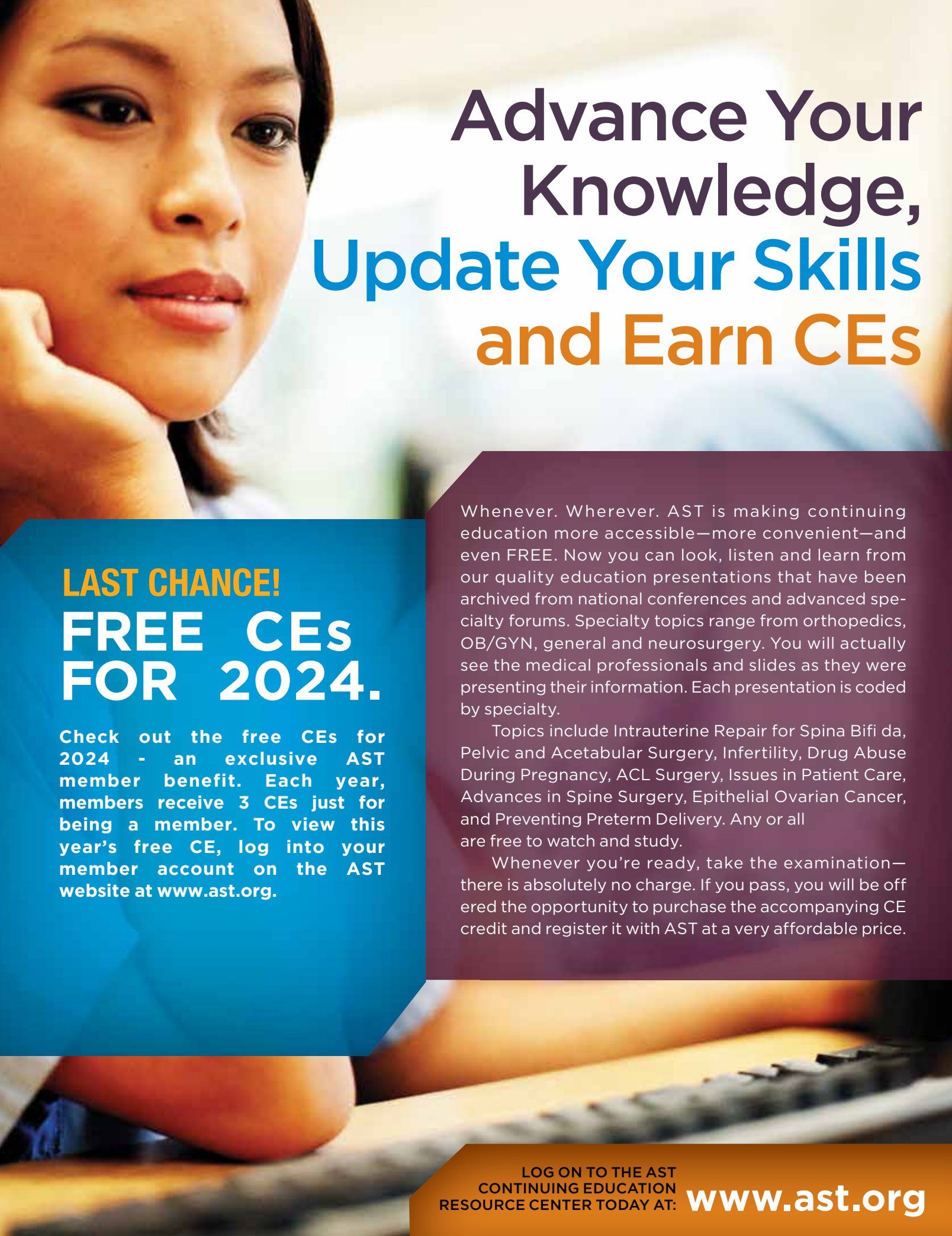
APPLY NOW

Apply for the FAST award by April 15. Applications can be found at the AST website - www.ast.org - Members - Fellows of AST

- Participation in activities in support of AST and the profession through state and national professional roles including but not limited to lecturer; researcher or author; spokesperson at the state legislative level or participation in mock surgery demonstrations for legislators; delegate to AST national conference; participation on state assembly and national committees and boards; and regular attendance to state assembly meetings and AST national conference. Additionally, participation in volunteer community activities that support the surgical technology profession and education, such as career fairs and community awareness projects.

Once you submit your application, it will be reviewed by the FAST Selection Panel. The panel will make their determination based on the applicant's submission and the recipients will be rewarded at that year's national conference. Applications are submitted through the member's portal on the AST website.



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Whenever. Wherever. AST is making continuing education more accessible—more convenient—and even FREE. Now you can look, listen and learn from our quality education presentations that have been archived from national conferences and advanced specialty forums. Specialty topics range from orthopedics, OB/GYN, general and neurosurgery. You will actually see the medical professionals and slides as they were presenting their information. Each presentation is coded by specialty.

Topics include Intrauterine Repair for Spina Bifi da, Pelvic and Acetabular Surgery, Infertility, Drug Abuse During Pregnancy, ACL Surgery, Issues in Patient Care, Advances in Spine Surgery, Epithelial Ovarian Cancer, and Preventing Preterm Delivery. Any or all are free to watch and study.

Whenever you're ready, take the examination—there is absolutely no charge. If you pass, you will be offered the opportunity to purchase the accompanying CE credit and register it with AST at a very affordable price.

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AST News

AT A GLANCE

Happy Holidays from the AST Board of Directors

Wishing you all a safe and healthy holiday season!

Front row: Director Jaime Lopez, CST, CSFA, RN, FAST; Director Rob Blackston, CST, CSFA, M.Ed, FAST; Director Lisa Day, CST, CSFA, BAS, FAST; President Joseph Charleman, CST, CSFA, DBA, FAST; Vice President Peggy Varnado, CST, CSFA, FAST; Director Nicole Van Vonderen, CST, FAST.

Back row: Treasurer Dustin Cain, CST, FAST; Secretary Nicol Bates, CST, FAST; Director David Blevins, CST, CSFA, MHA, FAST; Director Stephanie Austin, CST, EdD, FAST; Director Monica Thulon, CST, CSFA, FAST.

LAST CHANCE!

APPLY FOR A MEDICAL MISSION SCHOLARSHIP

Did you serve on a medical mission this year? If so, you may be eligible to apply for a medical mission scholarship.

Eligibility

To be eligible for a mission scholarship you must:

- Be an active AST member with currency.
- Complete and submit the Mission Medical Application and the Medical Mission Verification Form by December 31 of the year of your mission.
- Provide a description of your membership history—join date and any AST involvement.
- Upload official documentation of the mission program you have described.
- Upload official receipts documenting the costs incurred by the individual and all costs must be shown in dollars. All assistance is determined after the medical mission trip has occurred and the appropriate documentation has been provided. Upload supporting documents below.
- Upload two letters of recommendation, along with an article describing your experience for *The Surgical Technologist* journal and related photos.
- Write an article describing your experience for The Surgical Technologist and provide related photos before you will be reimbursed.

CE Credit

In addition to the medical mission scholarship, you could earn as many as 10 hours of CE credit toward your CST recertification. You can earn CE credit for a medical mission once per certification cycle but are only eligible to receive one scholarship.

APPLY FOR FAST

APPLY FOR THE PROFESSION'S HIGHEST HONOR

This prestigious honor began in 2006 as an opportunity to recognize those individuals who have upheld the highest professional, ethical and moral standards and traditions of the surgical technology profession, and whose professional activity has been devoted to the advancement of the profession toward improving the quality of surgical patient care.

Applications are available online and all applications are due by April 15.

Make sure to thoroughly read the selection criteria and gather all documents and information that are needed to complete the application prior to starting. Please plan ahead and allow for enough time to complete the application. If you close out of your window or browser before hitting submit, you will lose any details you have entered. Once you click submit, it will be submitted to the FAST Selection Panel. All required information must be completed before you are allowed to submit.

To apply for FAST, visit www.ast.org – Members – Fellows of FAST. You will need to use your login information to sign into your AST account. Then look for FAST and click on the application.

SCHOLARSHIPS

START APPLYING FOR THE FOUNDATION'S STUDENT SCHOLARSHIPS

The Foundation for Surgical Technology is committed to helping surgical technology students pay for tuition or pay off their educational debt. If you have the desire and ability to pursue a career in the operating room and need financial assistance, you should apply for a scholarship.

Deadline

Scholarship applications are **due by March 1** annually. Applications for academic scholarships open online during the fall semester. Scholarship award amounts range from year to year.

Eligibility

To be eligible for the Foundation's academic scholarships, you must demonstrate superior academic ability, have a need for financial assistance and be enrolled in an accredited program, thus making you eligible to sit for the national certification exam through NBSTSA.

Additional Requirements

If you are awarded a scholarship, you must join your national professional organization, the Association of Surgical Technologists (AST). Students member rates are $45. Scholarships are announced in May.

MILESTONES

Happy Anniversary!

Congratulations to the following state assembly as it celebrates an anniversary this month! AST appreciates your hard work, dedication and all your years of service for making our state assemblies the backbone of this organization.

- Washington – 25 years

STATEMENT OF OWNERSHIP, MANAGEMENT, AND CIRCULATION

1. Publication title: **The Surgical Technologist**
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12. **The purpose, function and nonprofit status of this organization, and exempt status for federal income tax purposes, have not changed during the preceding 12 months.**
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14. Issue date for circulation data: **October 1, 2024**
15. Extent and nature of circulation: Average number of copies each issue during preceding 12 months: A. Total number of copies: **53,050**; B. Paid and/or requested circulation: (1) Paid/Requested Outside-County Mail Subscriptions (include advertiser's proof and exchange copies): **52,650**; (2) Paid In-County Subscriptions (include advertiser's proof and exchange copies): **0**; (3) Sales through Dealers and Carriers, Street Vendors, Counter Sales, and Other Non-USPS Paid Distribution: **0**; (4) Other Classes Mailed through the USPS: **0**; C. Total Paid and/or Requested Circulation **52,650**; D. Free Distribution by Mail (samples, complimentary, and other free): (1) Outside-County: **390**; (2) In-County: **0**; (3) Other Classes Mailed through the USPS: **0**; E. Free distribution outside the mail (carriers or other means): **53**; F. Total free distribution: **443**; G. Total distribution: **53,093**; H. Copies not distributed: **162**; I. Total: **53,255**. Percent paid and/or requested circulation: **99%**. Actual number of copies of a single issue published nearest to the filing date: A. Total number of copies: **53,596**; B. Paid and/or requested circulation: (1) Paid/Requested Outside-County Mail Subscriptions (include advertiser's proof and exchange copies): **53,189**; (2) Paid In-County Subscriptions (include advertiser's proof and exchange copies): **0**; (3) Sales through Dealers and Carriers, Street Vendors, Counter Sales, and Other Non-USPS Paid Distribution: **0**; (4) Other Classes Mailed through the USPS: **0**; C. Total Paid and/or Requested Circulation: **53,189**; D. Free Distribution by Mail (Samples, complimentary, and other free): (1) Outside-County: **404**; (2) In-County: **0**; (3) Other Classes Mailed through the USPS: **0**; E. Free distribution outside the mail (carriers or other means): **60**; F. Total free distribution: **464**; G. Total distribution: **53,653**; H. Copies not distributed: **200**; I. Total: **53,853**. Percent paid and/or requested circulation: **99%**.

I certify that the statements made by me above are correct and complete. Jodi Licalzi, editor/managing editor.

Results from National Surgical Technologists Week Legislative Emails

Josephine M. Colacci, Esq., AST DIRECTOR OF GOVERNMENT AFFAIRS

LEGISLATIVE NEWS

Thank you to all the members who participated in sending emails to their elected officials on the state and federal levels to educate them about who surgical technologists are and to celebrate Surgical Technologist Week. These are the results of the email:

I received a couple of questions as to why we did this email push. We did this to simply educate elected officials on who the surgical technologist profession is and why all of you are so important. We were not asking them to do anything except to celebrate all of you. It is my hope that by having these emails sent to elected officials' offices that their staff will remember who you are if we should ever meet with them in the future.

Thank you to all of you that participated in this campaign.

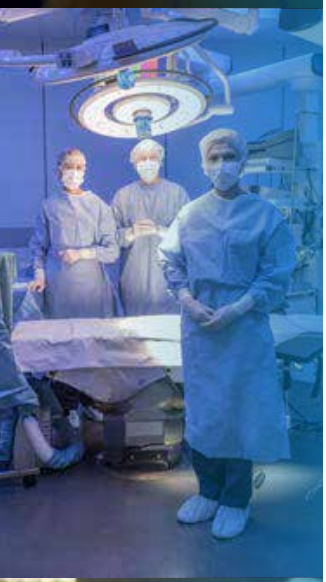
	Surg Tech Week 2024	Surg Tech Week 2022
Members Received Email	50,427	41,890
Members Opened Email	19,961 or 40%	1,116 or 2.6%
Members Clicked Through Email	2,704 or 5.5%	216 or 0.51%
Members Sent Email	2,661	132
Number of Elected Officials Reached	3,350	410
Number of Messages Sent	16,179	675

As you can see, we had A LOT more members participate in 2024 than we did in 2022. You will notice the dramatic increase in the number of messages that were sent to elected officials 16,179 compared to 675 in 2022 along with the number of elected officials that were reached 3,350 compared to 410 in 2022.

Application for the 2024 State Assembly Leadership Achievement Award

Eligibility Period: January 1 — December 31, 2024
Entry Deadline: January 31, 2025

Association of Surgical Technologists



Active state assemblies represent the future strength and success of the Association of Surgical Technologists. The Association acknowledges and honors those state assemblies that exemplify exceptional leadership within their respective states.

- To recognize excellence in leadership and member development, communication, education and community relations
- To encourage quality state management
- To recognize with distinction and visibility that efforts and results of meaningful activities that build a strong state
- To benchmark standards

Qualifications and Rules

- Held one annual business meeting per year
- Held at least two workshops per year
- Annual & midyear reports submitted by deadline
- Correct number of BOD and rotation
- Create marketing activity
- Media coverage
- Student involvement
- Instructor involvement
- Public education
- Up to five (5) awards will be awarded per year

Application online at:

https://ffst.formstack.com/forms/2024saleadershipachievementawardapplication

Selection

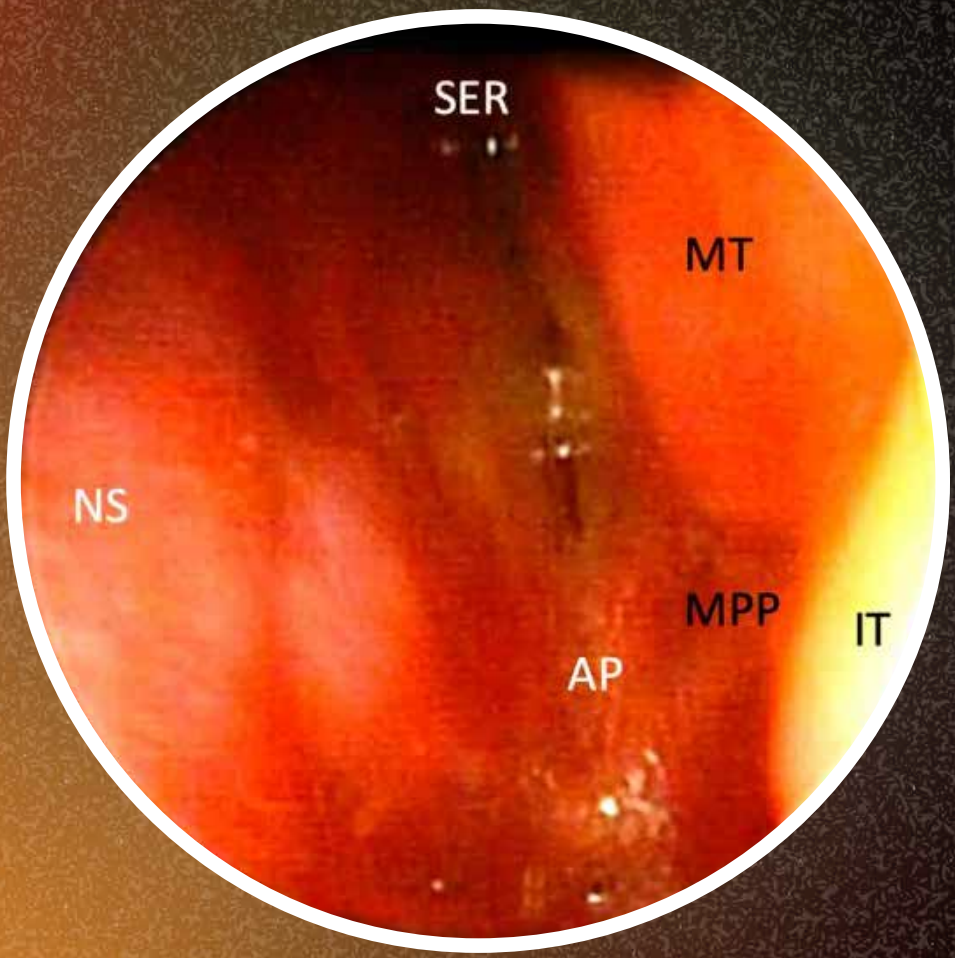
All applications received in the AST national office by January 31, 2025, will be eligible for one of the five National AST Leadership Awards. A maximum of 5 points can be awarded for each category 1-10, 50 points maximum. Each entry is judged independently by the State Assembly Leadership Committee. Winners of the Leadership Award are determined by the cumulative total of points earned.

Your State's Reward

1. Every state assembly awarded the Leadership Award will receive recognition at the AST National Conference Open Ceremony.
2. Each state official on the state board will receive a pin representing "Winner of the State Assembly Leadership Achievement Award."
3. Each state winner receives recognition in a feature article about their state in The Surgical Technologist.
4. Each state who wins a Leadership Award will receive a pennant that announces the state as a winner of this prestigious award to display at state meetings.

Eligibility and Entry Preparation

- Any AST approved state assembly may submit an entry.
- Eligibility Period: January 1–December 31, 2024, submitted by the state assembly president.
- Entry Deadline: January 31, 2025 to stateassembly@ast.org.
- Application: https://ffst.formstack.com/forms/2024saleadershipachievementawardapplication
- Strongly recommended to include supporting documentation with the application, as this can provide valuable content and strengthen the overall submission.
- A new application must be submitted each year.
- A state may receive this award once every four years from the date the award was received.
- All entries will become the property of AST and will not be returned.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Management of Choanal Atresia: National Recommendations with a Comprehensive Literature Review

Jure Urbančič [1,2], Domen Vozel [1,2,*], Saba Battelino [1,2], Imre Boršoš [1], Lev Bregant [3], Matic Glavan [4], Črtomir Iglič [1], Klemen Jenko [1,2], Boštjan Lanišnik [4,5] and Tanja Soklič Košak [1,2]

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Abstract: Choanal atresia is the most common congenital anatomical abnormality of the nasal cavities, manifested with a clinical picture of neonatal respiratory distress. The treatment requires interdisciplinary management based mainly on tertiary referral centre experiences. However, there is a lack of high-quality evidence in the available literature. Recommendations were prepared based on a systematic review of the supporting literature: on a website survey addressed to the participating authors consisting of 28 questions and on five live meetings. The initial response to the recommendations was determined at their presentation at the sectional meeting of the section for otorhinolaryngology of the Slovenian Medical Association. Then, reactions from the professional public were accepted until the recommendations were presented at the Expert Council for Otorhinolaryngology of the Slovenian Medical Association. A systematic literature review identified eight systematic reviews or meta-analyses and four randomized controlled clinical trials. Thirty-four recommendations for diagnosis, treatment and postoperative management were consolidated. The paper presents the proposal and first Slovenian recommendations for treating patients with choanal atresia. They are based on foreign medical institutions' published literature and our clinical experience. They represent the basic requirements of diagnostics and may represent an essential guide in treatment.

Keywords: nasopharynx; craniofacial abnormalities; infant; choanal atresia; charge syndrome

1. Causes of Nasal Obstruction in an Infant

Normal nasal patency is essential for the breathing of a baby, who, in the first months of life, breathes mainly through the nose [1]. However, in the early period of a child's life, breathing through the nose can be hindered due to congenital or acquired diseases of the nose or nasopharynx (Table 1). Congenital anatomical abnormalities of the nasal cavity (Table 1), including choanal atresia (CA), are rare causes of obstruction but often cause neonatal respiratory distress. In addition to congenital anatomical abnormalities, nasal obstruction can also be caused by congenital tumours, injuries, foreign bodies and inflammation. Inflammation of the nose and paranasal sinuses is the most common cause of nasal obstruction in infants but is mostly not directly life-threatening [2].

Table 1. Causes of nasal obstruction in infants.

Congenital tumours	• Neoplasms: chordoma, teratoma, haemangioma, rhabdomyosarcoma, craniopharyngioma, hamartoma, histiocytoma, hemangiopericytoma, lipoma, vascular malformation, congenital squamous cell carcinoma, teratoid, lymphoma • Cysts: dacryocystocele, incisive canal cyst, dentigerous cyst, mucocele, Thornwaldt's cyst • Midline masses: nasal dermoid, glioma, meningoencephalocele, encephalocele
Congenital anatomical abnormalities	• Nasal agenesis or partial dysgenesis • Anterior nasal stenosis • Midline nasal stenosis • Pyriform aperture stenosis • Choanal atresia/stenosis • Craniofacial syndromes: CHARGE, Binder, Crouzon, Apert, Treacher-Collins, Pfeiffer, Kabuki
Traumatic	• Nasal tip depression • Iatrogenic stenosis • Nasal septum fracture/dislocation • Nasal septum haematoma/abscess • Foreign body
Inflammatory	• *Rhinitis medicamentosa*: mother's or infant's medications • Neonatal rhinitis: meconium, allergy, GER, nasal milk regurgitation, infections (*Staphylococcus aureus, Chlamydia trachomatis, Treponema pallidum,* RSV etc.)
Metabolic diseases	• Hypothyroidism

Table 1 adapted from Roehm et al. (2013) and Gnagi et al. (2013) [2,3]. CHARGE—a syndrome characterized by coloboma (C), congenital heart defect (H), choanal atresia (A), mental and growth retardation (R), genitourinary tract (G) and ear abnormalities (E); GER—gastroesophageal reflux; RSV–respiratory syncytial virus.

2. Epidemiology, Pathogenesis and Anatomical Characteristics of Choanal Atresia

Choanae are paired anatomical structures that are superiorly delimited by the inferior surface of the sphenoid body, medially by vomer, laterally by the medial plate of the pterygoid process and inferiorly by horizontal part of the palatine bone.

CA is the most common congenital anatomical abnormality of the nasal cavities [1]. It occurs in one in 5000–8000 neonates, twice as common in females, twice as often on the right and twice as often unilaterally (i.e., the rule of two) [4]. In 70%, CA is bony, and in 30%, it is bony-membranous since the atretic plate also consists of the membrane and the bone. Very rarely, CA is exclusively membranous [2]. The atretic plate may partially (i.e., stenosis) or completely (i.e., atresia) block the choana [4]. At least half of patients have syndromes associated with CA, most commonly CHARGE syndrome, characterized by coloboma (C), congenital heart defect (H), choanal atresia (A), mental retardation and growth disorder (R), developmental disorders of the genitals or urinary tract (G) and ear deformity (E) [5]. CA can occur as part of Treacher-Collins [2], Apert [2], fetal alcohol [2], Pfeiffer [2,6], Crouzon [4], Binder syndrome [2], ectrodactyly-ectodermal dysplasia clefting syndrome [7], hypoparathyroidism, deafness and renal dysplasia syndrome [8], mandibulofacial dysostosis [4], craniofacial clefts [9], etc.

CA results from disturbed embryogenesis in the fourth week of gestational age [2]. From the first description of the disease by the German physician Johann George Röderer in 1755 until today, the origin is explained with four theories: 1. persistence of the embryonic buccopharyngeal membrane, 2. persistence of the nasobuccal Hochstetter's membrane, 3. improper migration of neural crest cells and 4. irregular growth of the mesoderm [10]. Disrupted embryogenesis is accompanied by medialization and ossification of the lateral nasal wall, especially the medial plates of pterygoid processes [2]. In addition, CA can occur due to vitamin A deficiency or taking thyrostatics during pregnancy [4].

3. The Clinical Picture of Choanal Atresia

The clinical picture of a patient with CA depends on the side and degree of impairment, associated craniofacial anomalies and systemic disease.

3.1. Bilateral Choanal Atresia

The position of the epiglottis above the soft palate and the tongue's contact with the soft palate along its entire length a few months after birth prevents normal breathing through the mouth. The infant begins to learn to breathe through the mouth between the fourth and sixth week of age, allowing for normal feeding through the mouth [3]. At six months of age, mouth breathing is usually established [2]. As a result, bilateral CA due to nasal obstruction in the infant may occur as life-threatening respiratory distress immediately at birth, when the infant cannot breathe, or later as respiratory distress at first feeding.

The clinical picture of nasal obstruction consists of cyanosis during feeding and improvement of breathing during crying (i.e., cyclic cyanosis), episodes of apnea, snoring, nasal flutter, nasal congestion, nasal discharge, stertor, snoring, intercostal and jugulum retractions, hyponasal cry, aerophagia with abdominal tension, sleep disturbances and growth retardation [3]. In addition, in associated diseases of the head, neck or distant organs, when endotracheal intubation of the neonate is required immediately after birth, CA may first appear only after several failed extubation attempts [4].

Bilateral CA is associated in 34% with other upper respiratory tract abnormalities, which lead to respiratory distress. These include subglottic stenosis, laryngomalacia and tracheomalacia. In addition, in 21%, bilateral CA is accompanied by other congenital craniofacial abnormalities (Table 1) [5].

3.2. Unilateral Choanal Atresia

Unilateral CA rarely causes neonatal respiratory distress syndrome. It is most commonly expressed later than bilateral CA, with a clinical picture of chronic unilateral nasal discharge and unilateral obstruction, which may resemble chronic rhinosinusitis or a foreign body in the nasal cavity. As a result, unilateral CA is often diagnosed later in adulthood [4].

4. Materials and Methods

When preparing the recommendations, we followed the procedure of Rosenfeld et al. (2013) for the preparation of clinical guidelines and recommendations in otorhinolaryngology—head and neck surgery [11] and general instructions for the preparation of clinical guidelines [12].

Instead of conference calls, five live meetings were held. Recommendations were written (Table 2), which were coordinated with the participating authors and institutions based on the supporting literature searched according to the procedure described in Table 3 and a website survey addressed to the participating authors consisting of 28 questions following the example of Moreddu et al. (2019) [13]. In addition, eight systematic reviews or meta-analyses [14–21] and four randomized controlled clinical trials [22–25] were identified.

Table 2. Summary of Slovenian recommendations for the management of choanal atresia.

Nr	Recommendation	L	Gr	Strength
1,2	In the case of respiratory distress in a neonate, a saline test should be performed to confirm nasal obstruction, followed by a test with an aspiration catheter of size Fr 6–8 [13]	IIa	C	Recommended
3	The otorhinolaryngological examination should include examination of the nose and face, anterior rhinoscopy, toilet, anemization, epimucosal anaesthesia of the nose and examination with a flexible or rigid endoscope [13].	I	A	Strongly recommended

Table 2. *Cont.*

4	In the case of bilateral CA, CT of the facial structures, nose, paranasal cavities and skull base should be performed with a slice thickness of 2–5 mm [4,13]	I	A	Strongly recommended
5	Head ultrasound should be performed for bilateral CA [26]	I	C	Strongly recommended
9	In the case of unilateral CA, a CT of the facial structures, nose, paranasal cavities, and skull base should be performed with a slice thickness of 2–5 mm [13]	IIa	D	Recommended
6, 7	In the case of bilateral CA, congenital abnormalities should be ruled out, so a clinical geneticist and a cardiologist should be involved because of heart diseases that would put the child at risk during the procedure [13]	I	B	Strongly recommended
8, 10	In the case of unilateral or bilateral CA, an audiovestibulological evaluation should be performed to assess hearing and treatment by a phoniatrician in case of additional swallowing problems [13]	I	D	Strongly recommended
11	Bilateral CA should be surgically treated between the 10th and 13th day of the neonate's age, even in the case of prematurity (Murray et al. 2019; Marston et al. 2019) [16,27]	I	A	Strongly recommended
12	Transnasal endoscopic choanoplasty should be performed in all patients with bilateral CA in whom an endoscopic approach is possible [13]	I	A	Strongly recommended
13	If a stent is used, it should be removed within seven days [18]	IIa	A	Recommended
14	In case of associated craniofacial abnormalities, neuronavigation should be used [4,9]	IIa	C	Recommended
15	Transnasal perforation with stent insertion can be performed in patients with thin bony-membranous bilateral CA or stenosis and in patients in whom transnasal endoscopically assisted perforation is not possible due to insufficient nasal lumen [4]	IIb	D	Optional
16	Transnasal endoscopically assisted perforation with stent insertion can be performed when transnasal endoscopic choanoplasty of bilateral CA is not possible due to anatomical conditions [4,13]	IIb	C	Optional
17	Transpalatal resection should not be the primary method of treatment for unilateral or bilateral CA [4,13]	III	A	Recommended against
18	Surgical treatment of unilateral CA should be performed after the baby is six months old [13]	IIa	A	Recommended
19	Transnasal endoscopic choanoplasty should be performed in unilateral CA. The extent of the resection should be large enough so that it is not necessary to insert a stent [13]	I	A	Strongly recommended
20	In the case of bilateral CA, where stents were used for a nasal passage, they should be changed endoscopically several times a week in the first and second postoperative weeks *	IIa	D	Recommended
21	Discharge from the hospital should be planned for the second postoperative week or as soon as possible after surgical treatment of bilateral CA *	IIa	D	Recommended
22, 23	In the case of bilateral CA, stents can be changed on an outpatient basis in the second postoperative week. They can be changed twice in the third week and once from the fourth week onwards *	IIb	D	Optional

Table 2. *Cont.*

24	In the case of bilateral CA, the stent should be removed in the fourth postoperative week, and nasal patency should be reevaluated a week later *	I	D	Strongly recommended
25	Photo documentation of the lumen of the choana should be done for unilateral or bilateral CA *	IIa	D	Recommended
26	A child with bilateral CA should be monitored for at least two years after the procedure or until the end of growth *	I	C	Strongly recommended
27	In case of problems with nasal patency and more than 50% reduction of the choanal lumen, a revision transnasal endoscopic choanoplasty should be performed [13]	IIa	A	Recommended
28	A proton pump inhibitor should be used daily for the first two months after unilateral or bilateral CA surgery [25]	IIa	C	Recommended
29	During the postoperative treatment of the infant, drops of saline solution and nasal glucocorticoid with low systemic absorption should be used daily intranasally for the first two months [13,28]	I	C	Strongly recommended
30	Antibiotic intranasal drops should be used exceptionally in the first postoperative week or later when noticeable purulent discharge appears *	IIa	D	Recommended
31	The first postoperative examination with assessment of nasal breathing with the mouth closed and feeding by mouth without pauses for breathing should be performed on the first postoperative day of bilateral CA treatment *	IIa	D	Recommended
32	On the second postoperative day of treatment for bilateral CA, discharge from the hospital can be planned *	IIb	D	Optional
33	Endoscopy should be performed one week after surgery, two weeks after surgery, and then four weeks after surgery for bilateral CA *	IIa	D	Recommended
34	Discharge from the hospital can be planned on the first postoperative day of treatment for unilateral CA *	IIa	D	Recommended

Nr—number of recommendation; L—level of evidence; Gr–evidence grade; Strength—the strength of recommendation. An explanation of the levels of evidence, evidence grades and determination of the strength of the recommendations are found in Table 4. CA–choanal atresia *—based on own experience.

Table 3. Three-step process of reviewing the supporting literature in preparing Slovenian recommendations for the treatment of choanal atresia.

Step of Literature Review: Article Types	**Database, a *Search Query***
1. step: systematic reviews, meta-analyses, clinical guidelines, recommendations	Cochrane Library: *choan* AND atresia in Title Abstract Keyword–(Word variations have been searched)*
	Web of Science: *TI = (choan* AND atresia) AND (TI = ((systematic review) OR (meta*)) OR TS = ((systematic review) OR meta* OR recommend* OR guideline*))*
	Scopus: *(TITLE(choan* and atresia) AND TITLE-ABS-KEY((systematic AND review) OR (meta*) OR recommend* OR guideline*))*
	Pubmed: *(choan*[Title] AND atresia[Title]) AND ((systematic review)[Title/Abstract] OR meta*[Title/Abstract] OR recommend *[Title/Abstract] OR guideline*[Title/Abstract])*

Table 3. *Cont.*

2. step: randomized controlled clinical studies	Web of Science: *TI = (choan* AND atresia) AND TI = (randomi*)*
	Pubmed: *(choan*[Title] AND atresia[Title]) AND (randomi*[Title/Abstract])*
	Scopus: *(TITLE(choan* AND atresia) AND TITLE-ABS-KEY(randomi*))*
	Literature review from systematic reviews, meta-analyses, clinical guidelines and recommendations included after 1st step of the literature review
3. step: other types of clinical articles	Literature review from studies included after the 1st and 2nd steps of the literature review.

With the first two steps of the supporting literature review, eight systematic reviews or meta-analyses and four randomized controlled clinical trials were searched. * is an operator

Table 4. Determination of recommendations' strength.

Evidence Grade	Type of Studies	The Preponderance of Benefit or Harm	Balance of Benefit and Harm
A (high-quality)	the data are derived from consistent level 1 studies	Strongly recommended	Optional
B (moderate quality)	the data are derived from consistent level 2 or 3 studies or extrapolations from level 1 studies	Recommended or strongly recommended	Optional
C (low quality)	the data are derived from level 4 studies or extrapolations from level 2 or 3 studies	Recommended	Optional
D (very low quality)	the data are derived from level 5 evidence or troublingly inconsistent or inconclusive studies of any level	Optional	No recommendation

For each recommendation, we determined the level of evidence and the evidence grade using the OCEBM Levels of Evidence (Table 4) [29]. In addition, we examined the risks and benefits of adopting each recommendation. Finally, we determined four levels of strength of recommendations (i.e., four types of text usage) following the example of the recommendations of the American Academy of Otolaryngology-Head and Neck Surgery (Table 4): strongly recommended, recommended, optional and strongly recommended against [11]:

- Strongly recommended means that the physician should follow the recommendation unless there is a clear and compelling argument against the recommendation.
- Recommended means that the physician should follow the recommendation but pay attention to new information and patient peculiarities.
- Optional means that the physician must be flexible in making decisions and accepting the recommendation. He must consider the possibility of taking different measures and measures adapted to the patient [11].

First, the evidence grade was determined for the included studies according to OCEBM [29], and then, the determination of strength with the benefit–harm ratio assessment by Rosenfeld et al. (2013) [11].

The preliminary response to the recommendations was determined at their presentation at the sectional meeting of the section for otorhinolaryngology of the Slovenian Medical Association on 19th December 2020. We accepted responses from the professional public until the recommendations were presented at the Expert Council for Otorhinolaryngology of the Slovenian Medical Association. This is the umbrella regulatory body for the field of

otorhinolaryngology in Slovenia. It reviewed recommendations, suggested corrections and approved them on 10th May 2021.

5. Results

Thirty-four recommendations were written (Table 2) and coordinated based on the website survey and review of the literature (Table 3), which identified eight systematic reviews or meta-analyses [14–21] and four randomized controlled clinical trials [22–25].

5.1. Diagnosis of Choanal Atresia

5.1.1. Bilateral Choanal Atresia

At birth or in the early postpartum period, the clinical picture of respiratory obstruction should be checked for nasal patency to rule out bilateral CA [30] and other causes of nasal obstruction (Table 1).

Recommendation 1: *In the case of respiratory distress in a neonate, we recommend that the physician perform a test with a saline solution to confirm or rule out nasal obstruction—level of Evidence IIa, evidence grade C (Table 2) (Figure 1).*

A few drops of saline solution are instilled into both nostrils. If the saline solution pours forward from the nostrils, the test is positive on the side (or both) where the spill is observed. This makes CA likely. If the saline solution passes into the throat, the test is negative. Therefore, CA is not possible, but respiratory distress can be caused by other causes of nasal obstruction (Table 1).

Recommendation 2: *We recommend a positive saline test followed by a Fr 6-8 aspiration catheter test—level of Evidence IIa, evidence grade C (Table 2) (Figure 1).*

An aspiration catheter is used to assess the patency of the nasal cavities and the nasopharynx and, in some cases, eliminates the reversible cause of nasal obstruction (e.g., meconium plug, lanugo, vernix). If it is not possible to insert the aspiration catheter 1–2 cm beyond the nostril, the obstruction is most likely due to deviation of the nasal septum or thickening of the inferior nasal turbinate, and in the case of the obstruction 3–3.5 cm deep, it is most likely CA or choanal stenosis. In addition to the test with an aspiration catheter, there is also a test with the instillation of methylene blue in the nostril with the examination of the pharynx, a test with a cotton swab or a mirror to observe the airflow through the nostrils [4] and the use of a stethoscope with the funnel removed to listen to the airflow through the nostrils [31].

After establishing a free airway and the initial clinical examination, an extended diagnostic workup is required in the early postpartum period, which depends on the clinical presentation and risk factors for associated abnormalities.

Recommendation 3: *We strongly recommend that the otorhinolaryngological examination include examining the nose and face to rule out associated abnormalities (Table 1). This should be followed by anterior rhinoscopy and toilet, anemization, and epimucosal anaesthesia of the nasal cavities with the selected anaesthetic. An examination should then be performed with a flexible or rigid endoscope—level of evidence I, evidence grade A (Figure 2) (Table 2) [13].*

Recommendation 4: *Although CA is a clinical diagnosis, we strongly recommend that a 2–5 mm slice thickness CT scan of the facial structures, nose, paranasal sinuses and skull base be performed in every patient to confirm the diagnosis and plan treatment—level of evidence I, evidence grade A (Table 2) [4,13].*

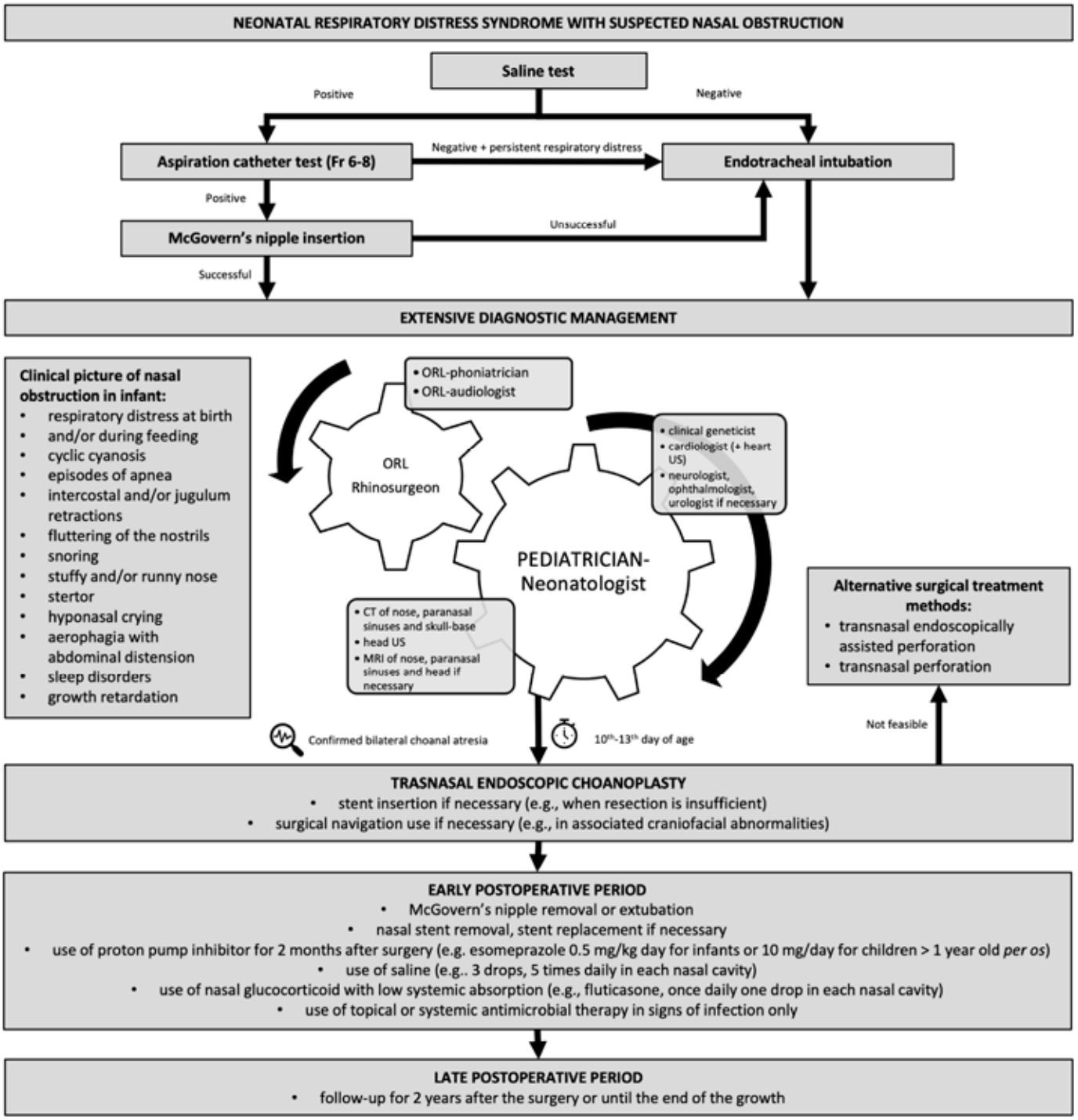

Figure 1. Algorithm for neonatal respiratory distress syndrome due to nasal obstruction caused by bilateral choanal atresia. The paediatrician and otorhinolaryngologist play a leading role in extensive diagnostic management. In cooperation with the otorhinolaryngologist, the paediatrician also takes care of coordination in treating the child by other specialists and for imaging and diagnostic evaluation. The otorhinolaryngologist primarily provides management by other subspecialist otorhinolaryngologists. A positive saline and aspiration catheter test means that the saline or catheter does not pass through the nasal cavity into the pharynx.

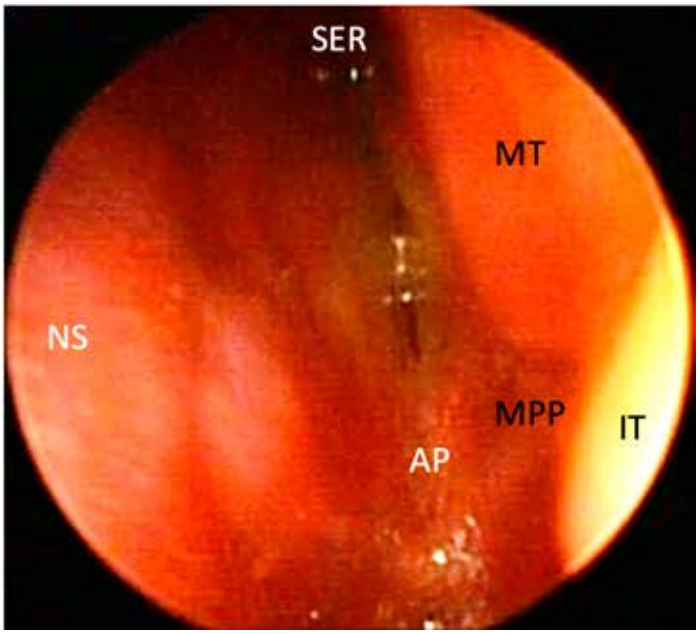

Figure 2. Endoscopic photograph of the left nasal cavity in a three-day-old neonate with bilateral bony choanal atresia. SER—sphenoethmoid recess; NP—nasal septum; MT—middle turbinate; IT—inferior turbinate; MPP—medial pterygoid plate; AP—atretic plate.

A CT can also identify other causes of nasal obstruction (Table 1) [4]. Before CT imaging, it is necessary to aspirate both nostrils, as mucus can be interpreted as soft tissue abnormalities, for example, encephalocele [32]. On CT, bony thickening of the medial plates of the pterygoid processes and thickening of the posterior part of the vomer is usually visible, narrowing or filling the lumen of the choana (Figure 3) [4]. At the same time, the same examination can also evaluate associated anatomical abnormalities, especially otological [13]. If the semicircular canal abnormalities are found simultaneously, CHARGE syndrome is very likely.

Recommendation 5: *We strongly recommend that a head ultrasound be performed to rule out central nervous system involvement, which is common, especially in preterm newborns—level of Evidence I, evidence grade C (Table 2) [26].*

An MRI of the head should only be performed in CA in selected cases [33].

Recommendation 6: *Bilateral CA often occurs in the context of other congenital syndromes, so clinical geneticist consultation is strongly recommended—level of Evidence I, evidence grade B (Table 2).*

Recommendation 7: *From the point of view of the need for surgical care of a child with bilateral CA, we strongly recommend excluding congenital abnormalities that would put the child at risk during the procedure, especially heart disease, so we recommend an evaluation by a cardiologist—level of Evidence I, evidence grade B (Table 2).*

Recommendation 8: *Even within otorhinolaryngology and in the postoperative period, we strongly recommend an audiovestibulological examination for a hearing evaluation and evaluation by a phoniatrician for additional swallowing problems—level of evidence I, evidence grade D (Table 2) [2,4,5,7–9].*

A neurologist, urologist or ophthalmologist is included in the treatment if necessary (Figure 1) [13].

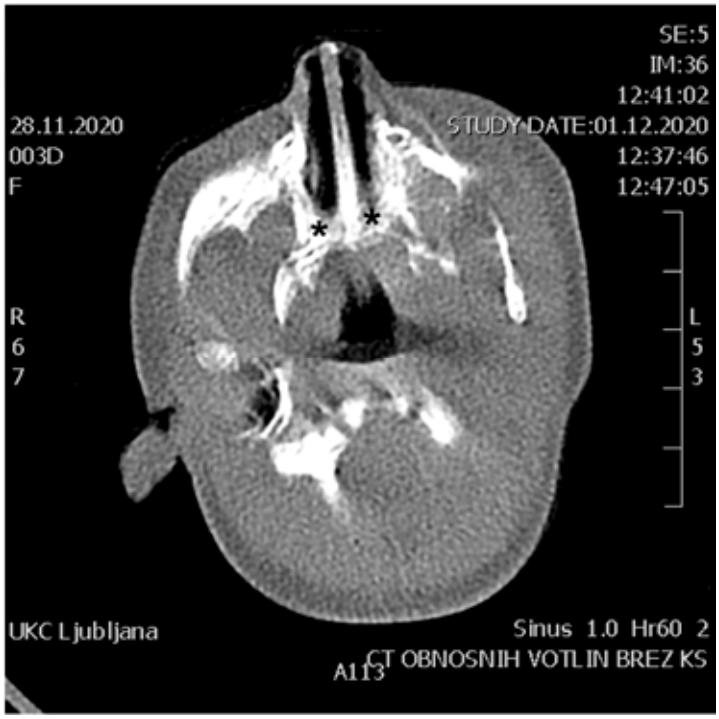

Figure 3. CT of the nose and paranasal sinuses in the axial plane. Bilateral bony choanal atresia is seen in a three-day-old neonate. * indicates atretic plate.

5.1.2. Unilateral Choanal Atresia

In the case of unilateral CA, the diagnosis is usually established later, as the clinical picture of unilateral CA is rarely manifested as respiratory distress. Therefore, diagnostics can be performed on an outpatient basis. The otorhinolaryngologist determines the patency of the nose using an aspiration catheter (appropriate size for the patient's age), anterior rhinoscopy and nasal endoscopy. Despite everything, he must also pay special attention to possible associated diseases and refer the patient for further treatment.

Recommendation 9: *In the case of unilateral CA, we recommend a CT of the facial structures, nose, paranasal cavities and skull base be performed. With an unmistakable clinical picture and endoscopic status, this is indicated only before surgical treatment to avoid the unnecessary exposure of the child to ionizing radiation—level of Evidence IIa, evidence grade D (Table 2).*

Recommendation 10: *In all cases of unilateral CA, we strongly recommend audiovestibulological evaluation, and for additional swallowing problems, treatment by a phoniatrician—level of evidence I, evidence grade D (Table 2).*

5.2. Treatment

5.2.1. Bilateral Choanal Atresia

Airway Management

Before a thorough diagnosis and therapy, it is necessary to immediately ensure a free airway through the mouth by inserting a McGovern nipple in case of bilateral CA (Figure 1). Then, a nasogastric or feeding tube is inserted next to or through the nipple. An endotracheal intubation is required if a free airway cannot be established with a nipple [4]. In any case, the definitive treatment of the airway in a child who breathes on his own is to ensure the patency of the nose as soon as possible. Tracheotomy is considered only if long-term mechanical ventilation is expected in the infant, for example, with associated cardiac, pulmonary, neurological disease or multilevel respiratory obstruction. More specifically, the indications for tracheotomy were described by Walsh et al. (2018) [34]. If possible, tracheotomy is not recommended in cases where successful surgical treatment

of CA can be performed. This paper does not provide an opinion or recommendations about tracheostomy.

Surgical Treatment

Recommendation 11: *We strongly recommend that bilateral CA be surgically treated between the 10th and 13th day of the neonate's age, even in the case of prematurity—level of evidence I, evidence grade A (Table 2) [16,27].*

Before surgical treatment, it is first necessary to carry out urgent diagnostic procedures to determine associated diseases and risk factors, especially cardiological treatment (Figure 1) [13]. Then, if the procedure under general anaesthesia is safe, the otorhinolaryngologist rhinosurgeon, will decide on the timing of the surgical treatment.

Even though the first description of surgical treatment of CA dates back to the mid-19th century, there is still no clear consensus on surgical techniques to date [4]. There are not enough systematic reviews and meta-analyses; only one systematic literature review was published in the Cochrane Library, in which it was found that out of 46 reviewed studies with descriptions of surgical techniques, none were suitable for the final analysis [14].

Surgical treatment can be divided into transnasal perforation, transpalatal resection, transnasal endoscopically assisted perforation and transnasal endoscopic choanoplasty (Figure 4). A stent can also be inserted regardless of the method to maintain choanal patency [4]. All surgical techniques are illustrated in Figures 5 and 6.

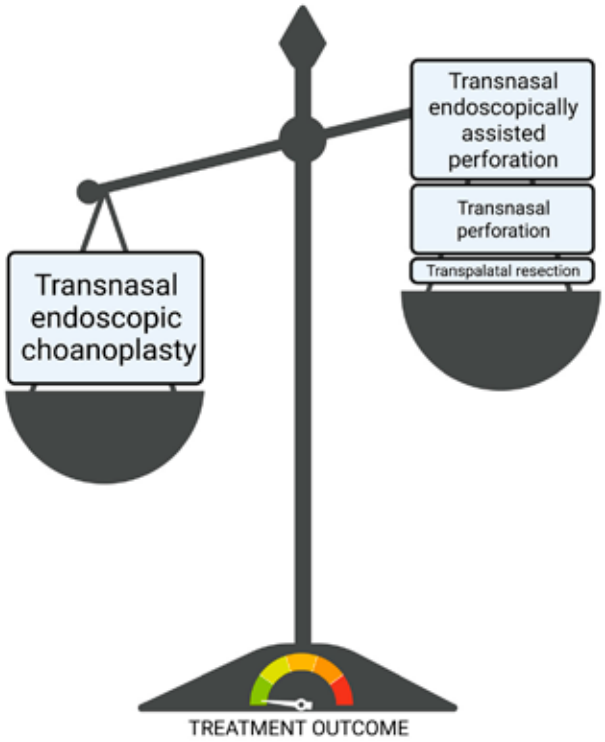

Figure 4. Types of surgical treatment methods of choanal atresia. Transnasal endoscopic choanoplasty is the gold standard with the best treatment outcome and lowest restenosis rate. Other surgical techniques present an alternative, e.g., transnasal endoscopically controlled perforation in cases where the manipulation with instruments is impossible due to the size of the nasal cavities, for example, in preterm infants. Transnasal perforation and transpalatinal resection represent the hierarchical bottom of surgical techniques and should not be performed.

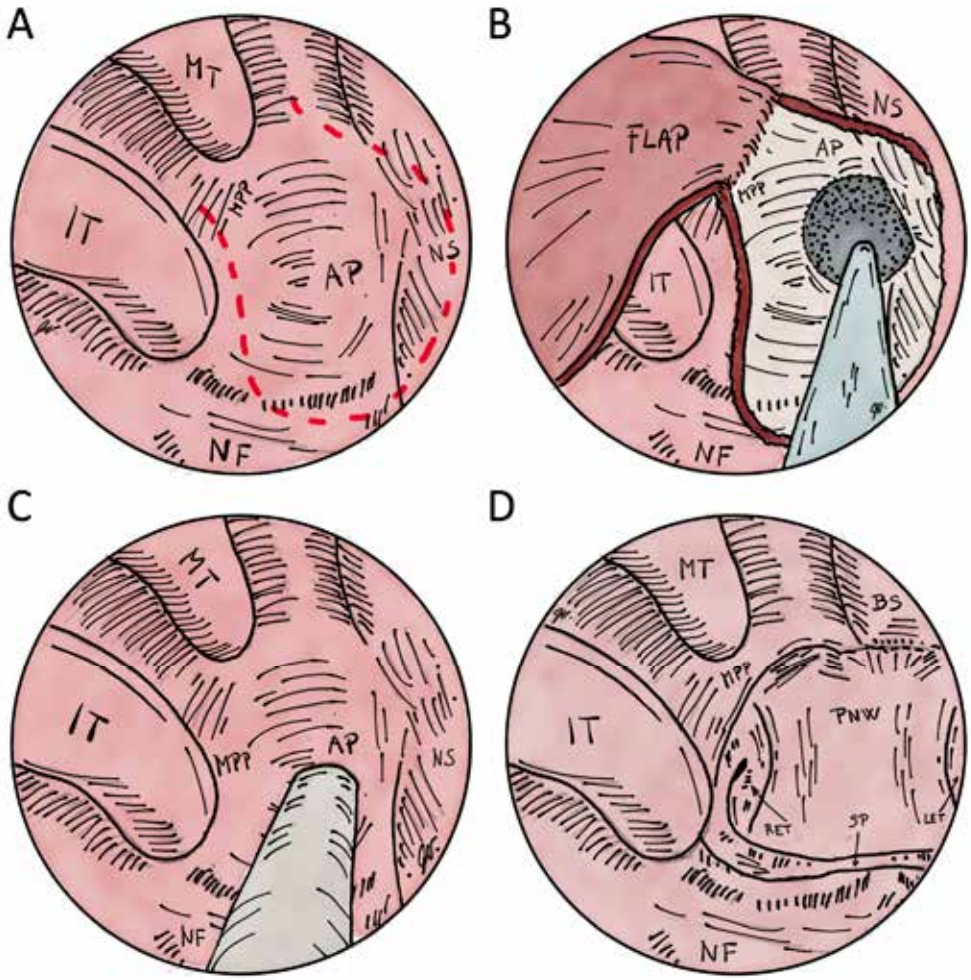

Figure 5. Illustrations of transnasal endoscopic choanoplasty and perforation for the treatment of choanal atresia. (**A**)–red dashed line shows flap margins before resection of atretic plate in right nasal cavity. (**B**)–flap is elevated to drill the exposed bone of the atretic plate and posterior nasal septum resection. After the resection, the flap is layed on the exposed bone of medial pterygoid plate and base of the sphenoid. (**C**)–transnasal perforation technique is shown with or without the assistance of endoscope. There is no mucosal flap elevation. (**D**) after posterior nasal septum resection and drilling of atretic plate to the level of medial pterygoid plate, an unichoana is created. MT–middle turbinate; IT–inferior turbinate; AP–atretic plate; NS–nasal septum; NF–nasal floor; MPP–medial pterygoid plate; BS–base of the sphenoid sinus; RET–right Eustachian tube; LET–left Eustachian tube; PNW–posterior nasopharyngeal wall; SP–soft palate.

Transnasal Endoscopic Choanoplasty

Transnasal endoscopic choanoplasty is considered the surgical technique of choice for the treatment of CA by most otorhinolaryngologists [4]. It is based on the endoscopic removal of the atretic area and the posterior part of the nasal septum, thereby creating a single choana (i.e., unichoana) (Figure 5A,B,D). Instruments for cold steel bone resection are primarily used, and, in the case of medialized medial pterygoid plates, a diamond drill is used [13] (Figure 7). The successful use of the CO_2 laser [13,35] and balloon dilators [13,36] has also been described. Suppose it is impossible to manipulate the instrument through the same nostril; the endoscope is inserted in the contralateral nasal cavity. In that case, it is advised to first puncture the posterior part of the nasal septum under the control of the endoscope and then continue resectioning the atretic plate with the endoscope inserted in the contralateral nasal cavity. The mucosa must be preserved in the form of flaps, which are placed on the exposed bony walls of the neochoana at the end of the

procedure, thereby preventing restenosis [4,20]. The success rate of transnasal endoscopic choanoplasty, determined by the occurrence of restenosis or the need for revision, is 65% according to a meta-analysis by Strychowsky et al. (2015) [18]. The possible risk factors for restenosis are associated congenital abnormalities, reflux of gastric contents in the nasopharynx and the age of the neonate <10 days since a lower age determines more unfavourable anatomical conditions that limit the visualization and extent of resection [4].

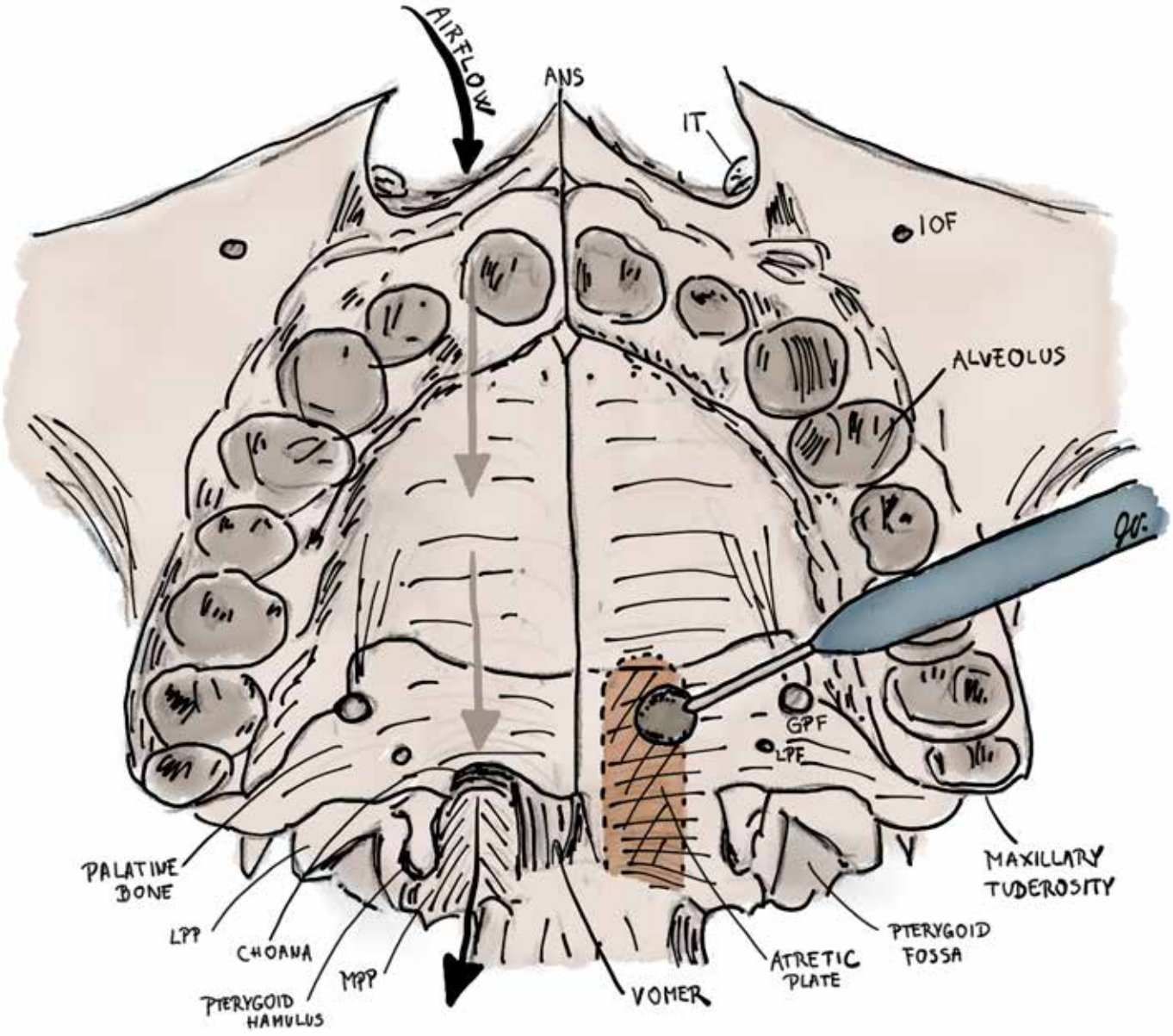

Figure 6. Illustration of transpalatal resection for the treatment of left-sided choanal atresia. Right nasal cavity has a normal patency. First the palatal flap pedicled posteriorly on both greater palatine arteries is elevated to expose the bone of hard palate. Then, the atretic plate, which is located between vomer and medial pterygoid plate, is burred (coloured brown) up to the height to the base of sphenoid sinus, medially to the vomer and laterally to the level of medial pterygoid plate. ANS–anterior nasal spine; IT–inferior turbinate; IOF–infraorbital foramen; LPP–lateral pterygoid plate; MPP–medial pterygoid plate; GPF–greater palatine foramen; LPF–lesser palatine foramen.

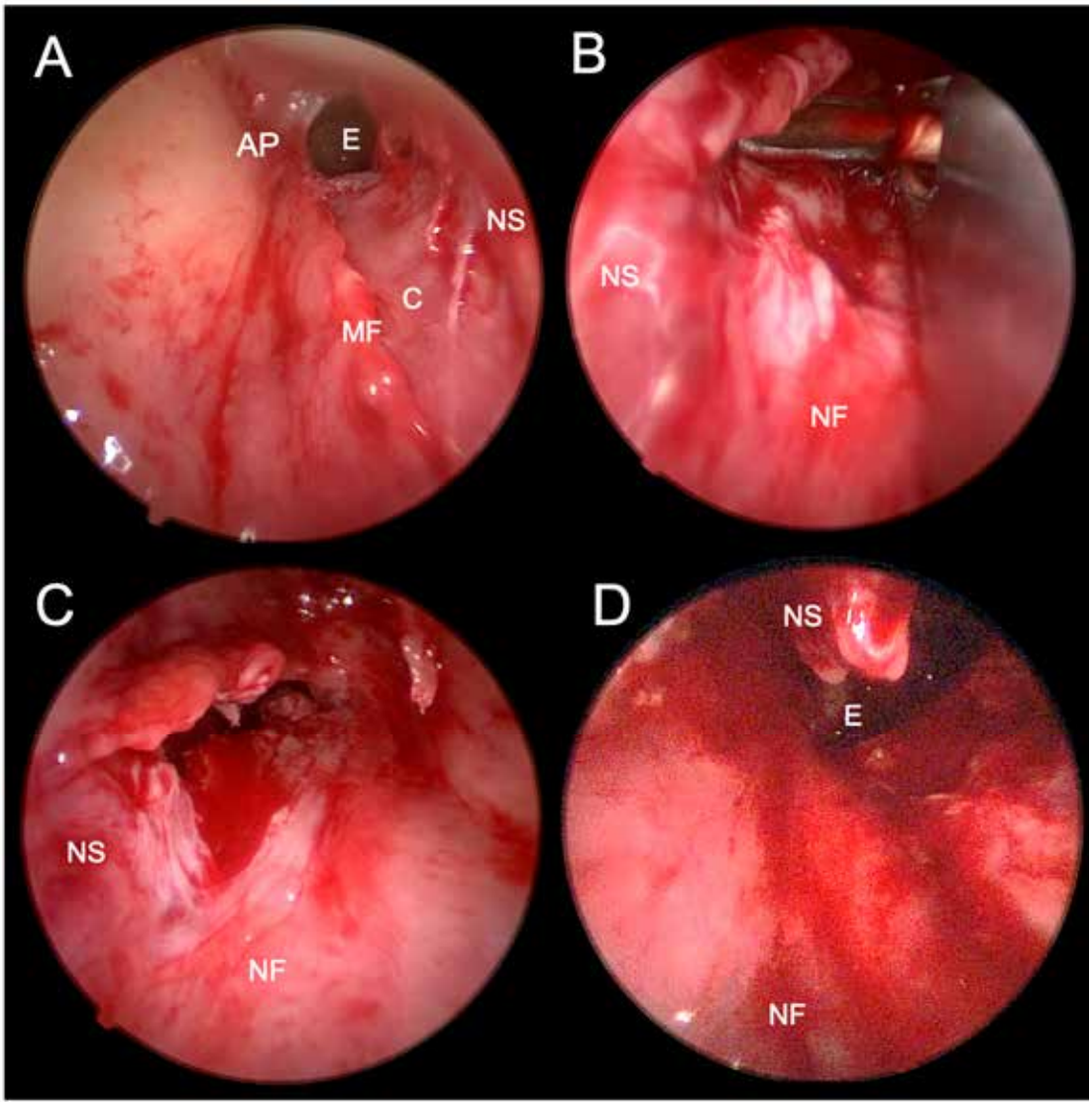

Figure 7. Endoscopic photographs of transnasal endoscopic choanoplasty of bilateral choanal atresia. (**A**)–after perforation of the atretic plate of the right nasal cavity and elevation of the mucoperichondrial flap of the nasal septum and atretic plate. (**B**)–resection of the posterior nasal septum with forceps through the left nasal cavity. (**C**)–after partial resection of the posterior nasal septum visible through the left nasal cavity. (**D**)–after a partially surgically formed unichoana, which connects both nasal cavities in the posterior nasal septum resection area. AP–atretic plate; E–epipharynx; C–cartilage; MF–mucosal flap; NS–nasal septum; NF–nasal floor.

Recommendation 12: *Transnasal endoscopic choanoplasty is strongly recommended in all patients with bilateral CA in whom an endoscopic approach is possible—level of evidence I, evidence grade A (Figure 1) (Table 2) [13].*

The insertion of stents, taking into account the advantages and disadvantages, can neither be recommended nor advised against since the success rate, regardless of stent insertion, is only 65% [18]. The advantages of using stents are a lower incidence of restenosis and satisfactory patency in the initial postoperative period. At the same time, the disadvantages are the need for more frequent treatment due to stent changes, irritation, erosion or ulceration of the nasal cavity, which can lead to the formation of adhesions and restenosis [4,21].

Recommendation 13: *If a stent is used, we recommend its removal within seven days to reduce the risk of complications [18] —level of Evidence IIa, evidence grade A (Table 2).*

Recommendation 14: *In case of associated craniofacial abnormalities, we recommend using navigation, which can be CT and/or MR-guided—level of evidence IIa, evidence grade C (Table 2).*

Navigation enables easier recognition of altered anatomical conditions and safer intervention in CA [4,9].

Transnasal Perforation

Transnasal perforation is an older surgical technique primarily performed blindly with a probe or dilator through the nostrils. Later, they started to simultaneously use a 120° endoscope or a mirror to examine the area of atresia. However, especially with the blind technique, there is a significant risk of complications arising from damage to the nasal septum, lateral nasal wall, nasal vault or clivus [4]. In addition, a high risk of restenosis has also been described [10].

Recommendation 15: *Transnasal perforation with stent insertion is allowed as an option in patients with thin bony-membranous CA or stenosis and in patients in whom transnasal endoscopic perforation is not possible due to small nasal lumen—level of evidence IIb, evidence grade C (Figure 1) (Table 2) [4].*

A stent can be a shortened endotracheal tube, an aspiration catheter or a similar medical device [25]. All should be changed regularly postoperatively (described below). In addition, the effective use of corticosteroid-eluting stents has also been described [37].

The use of mitomycin has been described in the prevention of restenosis. Still, it is not recommended due to its potential carcinogenicity and the lack of clinical efficacy data so far [13].

Transnasal Endoscopically Assisted Perforation

Recommendation 16: *Transnasal endoscopically assisted perforation with stent insertion is allowed as an option when transnasal endoscopic choanoplasty is not possible due to anatomical conditions—level of evidence IIb, evidence grade C (Table 2) [4,13].*

The procedure is identical to the described blind perforation with additional endoscopic control. This reduces the possibility of unwanted damage to adjacent tissues (Figures 1 and 5C).

In the case of prematurity, endoscopic transparency and the use of endoscopic instruments are limited, so transnasal endoscopic choanoplasty is often not possible. Then, transnasal endoscopically assisted perforation is the method of choice for treating bilateral CA. This procedure will most likely require a later (so-called revision) transnasal endoscopic choanoplasty when the child has grown, and the anatomical conditions allow this surgical treatment method.

There is no mucosal flap elevation and posterior nasal septum resection in transnasal perforation techniques (endoscopically assisted or unassisted).

Transpalatal Resection

In transpalatal resection, the mucous membrane of the hard palate is raised in a local flap, and the entire thickness of the bone in the area of bony atresia is drilled away (Figure 6). Despite the low incidence of restenosis, the complications of this operation are significant. These are malocclusion, palate necrosis, oronasal fistula, soft palate muscle dysfunction and velopharyngeal insufficiency. Therefore, this method is not recommended for children under six.

Recommendation 17: *In the primary treatment of CA, we recommend against transpalatal resection of CA—level of evidence III, evidence grade A (Table 2) [4,13].*

5.2.2. Unilateral Choanal Atresia

The age at which unilateral CA is treated depends on the patient's age at the time of the unequivocal diagnosis, which is based on the results of a systematic review by Murray et al. (2019).

Recommendation 18: *Surgical treatment of unilateral CA is recommended after the infant is six months old—level of evidence IIa, evidence grade A (Figure 1) (Table 2) [13].*

Even with the start of treatment after the third year of age, we expect the same results as before [13].

Recommendation 19: *Transnasal endoscopic choanoplasty is strongly recommended for unilateral CA due to the mostly good endoscopic visualization in older patients with unilateral CA. The extent of the resection should be large enough so that it is not necessary to use a stent—level of evidence I, evidence grade A (Table 2) [13].*

5.3. Postoperative Management

Postoperative management depends on the CA's location, the patient's general health and the patient's setting (i.e., outpatient or inpatient).

5.3.1. Bilateral Choanal Atresia

Postoperative treatment after surgical treatment of bilateral CA depends mainly on associated diseases, the gestational age of the neonate and the related need for treatment of other conditions. Children with CHARGE syndrome have a higher risk of postoperative complications and prolonged hospitalization [27]. The same is to be expected in premature infants. The intubated patient has an additional chance of complications due to extended postoperative mechanical ventilation and prolonged hospitalization [38].

Stented

Recommendation 20: *In the case of bilateral CA where a stent was used to ensure nasal patency, it is recommended that the stent be changed several times a week endoscopically during the first and second postoperative week—level of evidence IIa, evidence grade D (Figure 1) (Table 2).*

During this period, it is reasonable to increase the outer diameter of the stent so that the lumen of the neochoana increases significantly, such as twice the outer diameter of the endotracheal tube, as long as the anatomical conditions allow this increase (we did not reach the maximum possible dimensions). This is especially necessary after transnasal endoscopically guided perforation and transnasal perforation. After transnasal endoscopic choanoplasty, the insertion of stents is often not needed.

Recommendation 21: *We recommend that discharge from the hospital be planned for the second postoperative week or as soon as possible when the general state of health allows it and the patency of the stents is satisfactory with appropriate care—level of Evidence IIa, evidence grade D (Table 2).*

We monitor the child's breathing patterns until discharge. In addition to normal breathing, the main goal of treatment for bilateral CA is independent feeding without breaks as soon as possible after surgical treatment.

Recommendation 22: *Stent replacement on an outpatient basis in the second week is optional—level of evidence IIb, evidence grade D (Table 2).*

Recommendation 23: *In the third week, it is optional to replace the stent twice, and from the fourth week onwards, only once more—level of evidence IIb, evidence grade D (Table 2).*

Recommendation 24: *We strongly recommend removing the stent in the coming weeks and rechecking the patency the week after—level of Evidence I, evidence grade D (Table 2).*

The replacement of stents in the postoperative period can be postponed as long as their patency is satisfactory. Instead of changing stents, we can perform regular dilations, especially after transnasal endoscopically controlled perforation and transnasal perforation, for example, with a balloon dilator, which has already been used in the treatment of bilateral CA [36].

Recommendation 25: *Photo documentation of the lumen is recommended—level of evidence IIa, evidence grade D (Table 2).*

The intervals between check-ups are gradually being prolonged. Otherwise, restenosis after one year is rare [13].

Recommendation 26: *Follow-up is strongly recommended for at least two years after the procedure or until the end of growth to detect restenosis—level of evidence I, evidence grade C (Figures 1 and 8) (Table 2).*

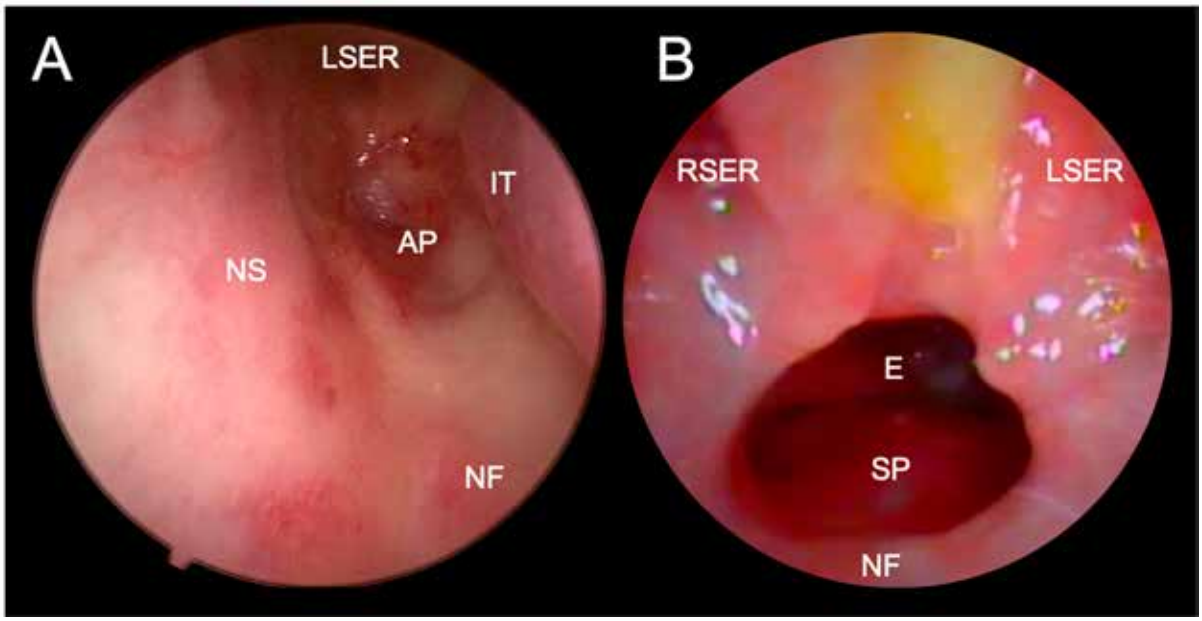

Figure 8. Endoscopic visualization of complete restenosis after transnasal perforation (**A**) and good patency of unichoana four weeks after transnasal endoscopic choanoplasty (**B**) of bilateral choanal atresia. A trace of milk and mucus is visible between the two sphenoethmoid recesses in Figure B, suggesting a significant influence of gastric contents reflux on the operative wound healing. LSER - left sphenoethmoid recess; RSER–right sphenoethmoid recess; IT–inferior turbinate; AP–atretic plate; NS–nasal septum; NF–nasal floor; E–epipharynx; SP–soft palate.

Upon discharge from the hospital, it is necessary to include the child's parents in the treatment process. They should be taught how to clean the nose effectively and reinsert the stent, and clear instructions should be given in the event of the infant's respiratory distress. In the case of breathing problems, poor nasal patency or discharge, a repeat examination by an otorhinolaryngologist is necessary to assess choanal patency accurately. In the postoperative period, we plan as few examinations as possible in the hospital.

Recommendation 27: *Revision transnasal endoscopic surgery is recommended in case of breathing problems, poor nasal patency or discharge and more than 50% reduction of the choanal lumen—level of evidence IIa, evidence grade A (Table 2).*

CT or other radiological examinations are not routinely indicated in postoperative management, even in restenosis [13].

Recommendation 28: *During the postoperative treatment of the infant, the daily use of proton pump inhibitors is recommended for the first two months (e.g., per os esomeprazole 0.5 mg/kg day*

for infants or 10 mg/day for children over one year of age)—level of evidence IIa, evidence grade C [25].

Recommendation 29: *During the postoperative management of the infant, the instillation of saline solution (e.g., 3 drops, 5 times a day in each nostril) and nasal glucocorticoid drops with low systemic absorption (e.g., fluticasone, one time a day, one drop in each nostril) are strongly recommended for the first two months—level of evidence I, evidence grade C [13,28].*

The drops should be instilled next to the stent and not into it.

Recommendation 30: *During the first two months of postoperative treatment of the infant, antibiotic drops are recommended exceptionally in the first postoperative week or later when noticeable purulent discharge appears—level of Evidence IIa, evidence grade D (Table 2).*

In the case of systemic signs of infection, identification of the source of infection and systemic treatment are indicated.

Non-Stented

In the postoperative treatment of patients after transnasal endoscopic choanoplasty of bilateral CA without inserted stents, the infant can already start eating food by mouth on the first day, as soon as the effects of general anaesthesia (anaesthetics and narcotics) wear off after a few hours. We monitor the child's breathing patterns, which must be appropriate in all life circumstances (sleeping and feeding). Otherwise, it is necessary to determine the cause of breathing problems, which may be local or an associated, unrecognized pathology.

Recommendation 31: *The first postoperative examination with the assessment of nasal breathing with the mouth closed and feeding by mouth without pauses for breathing is recommended the day after surgery (first postoperative day)—level of evidence Iia, evidence grade D.*

Recommendation 32: *We allow the possibility of discharge from the hospital on the second postoperative day—level of evidence Iib, evidence grade D.*

Recommendation 33: *We recommend nasal endoscopy one week after surgery, two weeks after surgery and four weeks after surgery—level of evidence IIa, evidence grade D (Figure 1) (Table 2).*

Photo documentation enables comparison between inspections. Instructions to parents and recommendations regarding the use of drops and revision surgery are the same as for patients with inserted stents [13].

5.3.2. Unilateral Choanal Atresia

Recommendation 34: *With unilateral CA, the risk of respiratory distress is very low, so we recommend discharge on the first postoperative day—level of evidence IIa, evidence grade D (Table 2).*

We perform the first examination on this day, especially the nasal cavity toilet. We are planning the subsequent outpatient check-up in one week. In the following weeks, the otorhinolaryngologist decides on the frequency of check-ups. Parental instructions and recommendations regarding the use of drops, follow-up and revision surgery are the same as for patients with stents.

6. Conclusions

The paper presents the first Slovenian recommendations for treating patients with choanal atresia. They are based on foreign medical institutions' published literature and our clinical experience. They represent the basic requirements of diagnostics and are a possible essential guide in treatment, which, however, must be adapted according to the current situation. Therefore, a thorough review of each recommendation is necessary before implementation.

However, these recommendations focus on the otorhinolaryngological management of choanal atresia, which should be considered. Moreover, only a small number of systematic reviews and meta-analyses are included in this study.

In further decades of experience and technology development, recommendations can be expected to improve due to changes in treatment, especially transnasal endoscopic surgical techniques, the use of stents and other methods of preventing restenosis. Therefore, it makes sense to create a register of patients with choanal atresia and other congenital anomalies of the craniofacial area, upper respiratory tract and gastrointestinal tract for prospective data collection.

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Management of Choanal Atresia: National Recommendations With a Comprehensive Literature Review

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1. Which of the following statements is true regarding the rule of two?

A. Twice as common in females, twice as often on left side, twice as often unilaterally

B. Twice as common in females, twice as often on right side, twice as often unilaterally

C. Twice as common in males, twice as often on right side, twice as often bilaterally

D. Twice as common in males, twice as often on left side, twice as often bilaterally

2. Choanal atresia can occur because of a deficiency in vitamin _____ during pregnancy.

A. K

B. E

C. D

D. A

3. What is the reason for unilateral choanal atresia being diagnosed later in life?

A. Does not develop until adulthood

B. Not associated with other congenital pathologies

C. Does not cause neonatal respiratory distress syndrome

D. Does not cause cardiovascular anomalies to occur

4. If the aspiration catheter can be inserted _____ centimeters deep a choanal atresia diagnosis is most likely.

A. 2 – 2.5

B. 3 – 3.5

C. 4 – 4.5

D. 5 – 5.5

5. Which of the following procedures is considered the standard surgical treatment?

A. Transnasal endoscopic choanoplasty

B. Transnasal perforation

C. Transnasal endoscopic-assisted perforation

D. Transpalatal resection

6. When a transpalatal resection is performed the mucous membrane of the _____ is elevated to create a flap.

A. soft palate

B. atretic plate

C. hard palate

D. nasal septum

7. Which laser has been successfully used when performing a transnasal endoscopic choanoplasty?

A. CO2

B. Nd:YAG

C. Argon

D. Erbrium

8. When the endoscope must be inserted in the contralateral nostril during a transnasal endoscopic choanoplasty procedure, the _____ portion of the nasal septum must first be punctured.

A. posterior

B. lateral

C. anterior

D. medial

9. It is recommended that surgery for bilateral choanal atresia be performed between the _____ and _____ day of age.

A. 6th, 9th

B. 10th, 13th

C. 14th, 17th

D. 18th, 21st

10. For medialized medial pterygoid plates, what should the CST have ready for the surgeon to use during a transnasal endoscopic choanoplasty?

A. Kerrison rongeur

B. Lambotte osteotome

C. Oscillating saw

D. Diamond drill

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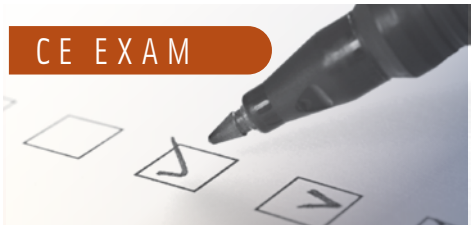

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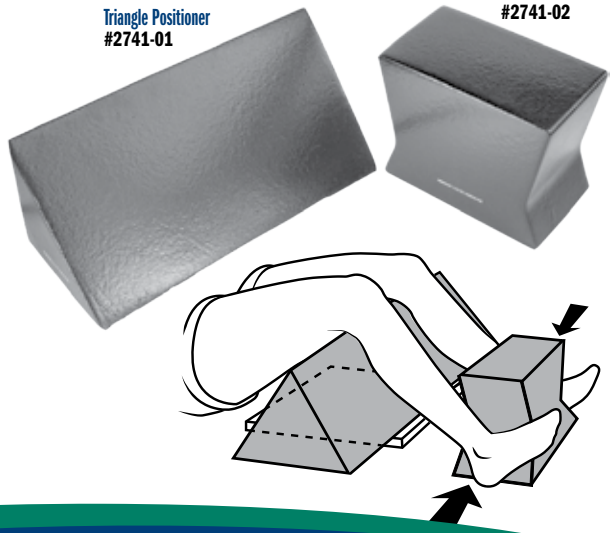

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The Foundation for Surgical Technology funds various awards during the year, but it is best known for the academic scholarships that assist students entering the field. In 2024, a total of more than $40,000 was awarded. Over the next couple months, we will be introducing you to this year's scholars and allowing them to describe what this award means to them.

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MARIA ELENA BELTRAN ALCANTAR

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I've always been drawn to the medical field, but I wanted to find a role where I could be hands-on and directly involved in helping others. Surgical technologist stood out to me because it's a career that blends precision, teamwork, and the opportunity to make a real difference in people's lives. What excites me most about this field is the ability to play a crucial role in the operating room. The idea that I can help ensure surgeries run smoothly assisting surgeons, managing vital equipment, and maintaining a safe, sterile environment is deeply motivating. It's a fast-paced and challenging setting, but that's exactly what I love about it. I enjoy working in environments where quick thinking and attention to detail are key, and I know I can bring those skills to the OR. Beyond the technical aspects, I'm passionate about the impact this career has on patient care. Being part of a team that helps people through some of their most critical moments is something I'm truly committed to. Surgical technologist offers me not just a job, but a meaningful way to contribute to healthcare and help improve outcomes for patients. This career feels like the perfect fit for me, and I'm eager to bring my dedication and skills to this important role.

HAILEY C BOAL

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I want to start off with how grateful I am to receive this award. It means a lot to be recognized for my hard work. Thank you! I chose a career in surgical technology because I loved the idea of being able to participate and learn so many different surgeries, helping patients, and honestly, the never-ending opportunities to learn from the doctors and each case that I was a part of. I enjoy a lot of things about surgical technology, but my favorite things are getting to be a part of the team that helps the patient with whatever is ailing them and getting to directly help them get better by knowing what the surgeon needs for the case. I love how fast-paced and hands on it is. I've also really enjoyed getting to learn and participate in robotic surgeries.

As for right now, my plans are to work at a hospital and become a well-rounded tech! I learned a lot during my clinical rotation, but I am looking forward to expanding my knowledge even further as a surgical technologist and work on areas and skills that I know I need to improve on. In the future, I'd like to find a specialty that I enjoy and take the proper steps and training to become a part of their team! I'd also love to go back to school to become a first assist.

Again, thank you for choosing me as one of the recipients for this reward. It means a lot to me. I appreciate it greatly!

PAYTON E LAUTZ
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Choosing surgical technology as a career wasn't just about finding a profession – it was about finding a purpose. I wanted to be part of something where every moment mattered, where every action, no matter how small, could impact someone's life in a profound way. I am forever grateful.

My plan is to continue flourishing in the classroom and in clinicals, retaining my 4.0 GPA, and expanding my knowledge in this ever-changing field. In the future, I plan to specialize, perhaps in neuro/spine. I can't wait to do what I love while helping provide for my family.

I am a second-year student, due to graduate in May 2025. My favorite part of surgical technology is truly being a part of the surgical team. Assisting in surgeries that diminish people's pain, relieve the patients/their families medical stressors, and give people their life back, is a gift beyond comparison.

After graduation, I am most excited to get my hands dirty (figuratively!) and really dive into the profession. I look forward to continuing my education eventually, possibly in PA school. Most importantly, I imagine the day my daughter sees me in my scrubs, knowing that her mom is part of something bigger: helping to save lives, being part of a team that makes a difference. I want her to be proud, to know that all the sacrifices were for this moment, for this chance to show her that strength doesn't come from never falling, but from always getting back up. Nothing makes me more excited than the thought of that.

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$1,000
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I am incredibly grateful for the opportunity that this scholarship provides for allowing me to pursue my passion for surgical technology. My journey has been one of resilience and transformation, and I firmly believe that my experiences have uniquely prepared me for a career in this field. I chose surgical technology because it aligns perfectly with my desire to make a tangible difference in the lives of others. Growing up in Belize, I witnessed the impact of limited healthcare resources, which ignited my passion for the field. My commitment to improving healthcare, especially in underserved communities, fuels my aspiration to become a skilled surgical technologist. I aim to contribute to high-quality patient care and address the systemic issues that plague healthcare systems, particularly in my hometown.

I am deeply engaged in my studies in the surgical technology program, where I am honing my skills and knowledge. My immediate goal is to graduate and become a proficient surgical technologist, ready to make a difference in the operating room. In the future, I aspire to become an educator in this field, sharing my knowledge and experiences with the next generation of healthcare professionals. I envision creating programs that empower students to excel in their careers while addressing critical issues in mental health and healthcare accessibility.

My time in clinical rotations has been nothing short of enlightening. The best part of my job is witnessing teamwork and camaraderie that defines the surgical environment. I enjoy the adrenaline rush of the operating room, where every second counts, and the satisfaction that comes from being part of a team dedicated to patient well-being. I find joy in the intricate details of surgical procedures, knowing that my contributions directly impact patient outcomes. This experience has solidified my belief that I am on the right path, especially when seeing how many of the disciplines of the OR can directly translate into my everyday life.

As graduation approaches, I look forward to stepping into the professional world with a sense of purpose and determination. I am excited to apply what I have learned and to continue growing as a surgical technologist. My aspirations extend beyond personal success; I want to be an advocate for patients and a mentor to those who may follow a similar path. This scholarship will empower me to focus on my education without the burden of financial strain, allowing me to fully commit to my goals.

In summary, this scholarship represents more than just financial support; it is an investment in my future and a testament to the resilience and strength I have developed through my journey. I am dedicated to using my experiences to inspire change in healthcare, and I am eager to embrace the opportunities that lie ahead. Thank you for believing in my potential and for supporting my dreams.

ROSIBEL ZEPEDA TOPETE, CST

CONTRA COSTA MEDICAL CAREER COLLEGE

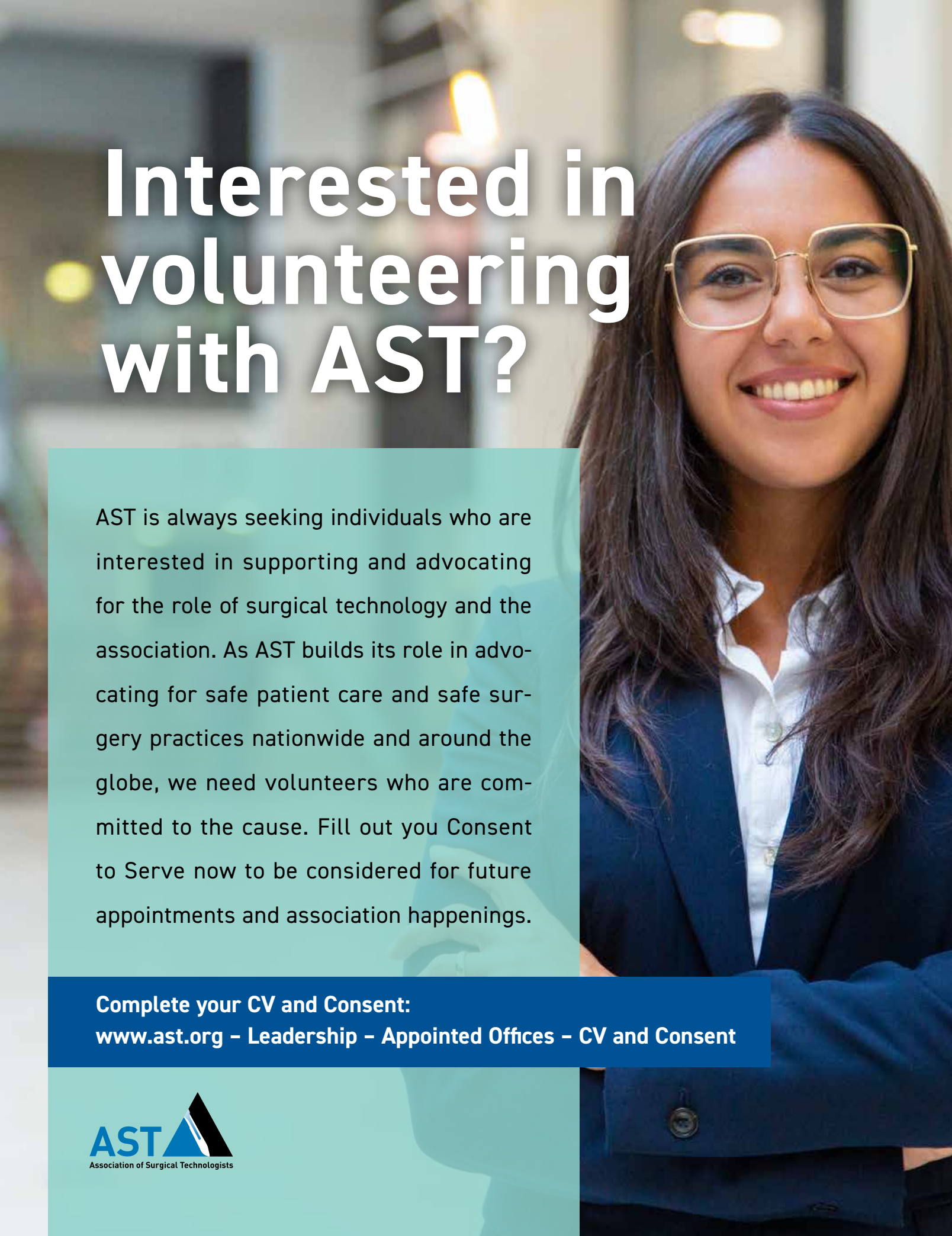
$1,000

SPONSORED BY THE FOUNDATION FOR SURGICAL TECHNOLOGY

I chose to become a surgical technologist because it offers the chance to make a direct impact on patient care by ensuring surgeries run smoothly, from preparing the operating room to assisting surgeons, which improves patient outcomes. The fast-paced, hands-on nature of the job keeps me engaged, as no two days are the same, and I thrive under pressure. Working in a team with surgeons and nurses fosters collaboration in a high-stakes environment. With the growing demand for healthcare, surgical technology provides job stability and opportunities for advancement, while the satisfaction of knowing my work helps save lives gives me a deep sense of purpose and fulfillment.

My plans are to be versatile in all surgical services at Children's Hospital, where I am now employed, to reflect a strong commitment to expanding my skills and making a broad impact. By gaining expertise across various surgical specialties, I'll enhance my ability to support diverse teams and procedures, while positioning myself as a key contributor in pediatric healthcare. This versatility can also open doors for growth and leadership opportunities in the future.

Being part of a team in a surgical environment is incredibly rewarding. The sense of unity and collaboration is crucial, especially when every member plays a vital role in ensuring the best possible outcome for the patient. Working closely with skilled professionals in high-pressure situations fosters trust and a shared commitment to success, which can make each surgery feel like a powerful team effort. The aspect I enjoy most about working in surgery is the fast-paced environment. Every day brings a new challenge, and the ability to stay focused and think on your feet keeps the job exciting. The teamwork involved in surgery is also highly fulfilling; collaborating with skilled surgeons, nurses, and anesthesiologists creates a sense of camaraderie and trust, knowing that we're all working toward the same goal of patient safety and recovery.



Interested in volunteering with AST?

AST is always seeking individuals who are interested in supporting and advocating for the role of surgical technology and the association. As AST builds its role in advocating for safe patient care and safe surgery practices nationwide and around the globe, we need volunteers who are committed to the cause. Fill out you Consent to Serve now to be considered for future appointments and association happenings.

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www.ast.org – Leadership – Appointed Offices – CV and Consent

AST
Association of Surgical Technologists

Meet AST's Education and Professional Standards Committee

Felicia McGhee, CST, EdD-C, FAST, CHAIR

Felicia (Fe) McGhee has been honored to serve on the Education and Professional Standards Committee since 2021. Felicia was recently appointed as the committee's chair for the 2024-2025 calendar year. She celebrates over 10 years as a Certified Surgical Technologist. She is a native of Baton Rouge, Louisiana, but graduated from Cambridge College in Aurora, Colorado, in 2004. She began working for Denver Health Medical Center after her graduation until moving back to Louisiana in 2009.

In 2013, she began working for South Louisiana Community College, Lafayette, Louisiana. In 2015, she transferred to the sister campus Baton Rouge, Baton Rouge Community College as the Clinical Coordinator at both programs. She became the program director in 2024. Her passion is to reach every learner and give them the fundamental skills to build their careers. She believes that if a learner enjoys her lectures, they are absorbing the material.

Fe has served on the Louisiana State Assembly Board from 2014 to 2023 and has held the positions of president and board of directors. She has been a member of AST for many years and was awarded the Fellow of the Association of Surgical Technologists (FAST) designation in 2024. She also completed a Bachelor of Arts in Sociology, 2012, with a concentration in Child and Family Studies. She obtained a Master of Science in Education with a concentration in Instructional Design and Technology in 2018. She is currently all but dissertation, Doctoral Candidate, with a degree in Education Technology. She also works part time in the operating room.

When she is not in class or the OR, she spends time shopping or traveling, hanging with her Mardi Gras Krewe (Krewe of Athena) or doing community service with her OES chapter (POA164). Fe has four children. One son, 27, and three daughters, 21, 19, and 10. The last one keeps her on her toes.

Shea Coleman, CST, B.S., FAST

Shea Coleman is proud to serve on the Education Professional Committee. With over 13 years of experience as a Certified Surgical Technologist, Shea graduated from Hinds Community College and began her career in the field of surgical technology. She joined Holmes Community College in 2014 as an instructor and advanced to become the Program Director, a role she has held for 2 years. Her passion lies in surgical technology and teaching, ensuring her students receive the best education and hands-on training.

Shea has been an active member of the Mississippi State Assembly Board since 2011, holding positions such as Board of Director, President, Vice President, and currently serving as Treasurer. She has been a member of the Association of Surgical Technologists for many years and was honored with the Fellow of the Association of Surgical Technologists designation

in 2022. She also holds a Bachelor of Science degree in Clinical Exercise Physiology from Mississippi State University.

When she isn't teaching, Shea enjoys spending time with her family as well as engaging in hobbies like kayaking and traveling. Shea values quality time with loved ones and is excited to continue her work in shaping the future of surgical technology.

Stacie Chaney, CST, BSHA, FAST

Stacie Chaney is a seasoned professional in surgical technology with a strong background in both clinical practice and academic leadership. She has expertise in maintaining compliance with accreditation standards from agencies such as CAAHEP, ACCSC, ABHES, and COE. Her experience spans multiple surgical specialties, including orthopedics, ophthalmology, pediatrics, vascular, and more.

As the Program Director at American Career College, Stacie oversees curriculum development, faculty mentoring, and program management. Her leadership has driven significant improvements, including increasing entrance test scores and achieving program pass rates that meet accreditation benchmarks. Stacie has been an AST member since 2011 and earned her FAST designation in 2019.

Kristie Cole, CST, M.Ed, FAST

Kristie has been a member of the Association of Surgical Technologists (AST) since 2006. With over 18 years of experience in the surgical technology field, she currently serves as the Director of the Surgical Technology and Sterile Processing Program at South Plains College, where she has been a faculty member since 2010 and received tenure in 2019. Kristie is also an Assistant Professor, focusing on curriculum development, student advisement, and clinical instruction.

Kristie holds a Master of Education in Human Resources from Wayland Baptist University and a Bachelor of Applied Science with a specialization in Surgical Services. She is pursuing her Doctorate in Organizational Leadership from Abilene Christian University, with her dissertation focusing on "Surgical Technology Orientation in Healthcare Organizations and its Impact on Patient Safety," and is projected to graduate in 2026. In 2024, Kristie earned the prestigious Fellow of the Association of Surgical Technologists (F.A.S.T.) designation in recognition of her outstanding contributions to the profession and her commitment to education and leadership.

Kristie currently serves as the AST Texas State Assembly Secretary, following her term as a Board of Director, which began in 2020. She has presented at various national and state-level AST conferences, where she speaks on precepting, self-leadership, communication, and time management. In addition to her academic and professional achievements, Kristie is deeply committed to serving her community through roles in her local church, including teaching Sunday School and Kids' Church, serving on the Budget and Financial Committee, and participating on the Vacation Bible School Committee.

Kristie is honored to serve on the AST Education and Professional Standards Committee (EPSC) since 2022, where she contributes to the development of educational strategies and standards for surgical technologists.

Meloney McRoberts, CST, AAS, FAST

Meloney McRoberts is an Associate Professor with 23 years of experience working at Southern West Virginia Community & Technical College. Meloney is a West Virginia native and a 2001 Southern West Virginia Community & Technical College Alumnus. Meloney specializes in surgical technology and coordinates clinical education; provides academic oversight, including curriculum planning and development of student clinical experience; and ensures documentation of the evaluation and progression of clinical performance leading to clinical competence. Meloney is a powerful force in the classroom. She uses her positive attitude and

tireless energy to encourage students to work hard and succeed. Meloney values learning from others and making genuine connections with her students. In 2019, Meloney received the Savas-Kostas Award for Excellence. This award is presented to those who exhibit outstanding and distinguished service to the college.

During the last six years, Meloney has been involved in the West Virginia AST State Assembly, where she has held positions on the board of directors and as vice president. Currently, she serves as the president of WVAST. Meloney has a passion for her career and loves to speak about it with those who have no idea what a surgical technologist is or does. In July of 2021, she received the Fellow of the Association of Surgical Technologists (FAST) designation at AST's national conference in Las Vegas, Nevada. Meloney is honored with her appointment to the national AST Education & Professional Standards Committee (EPSC). This committee is responsible for developing strategies that enhance entry-level surgical technology education, reviewing the production of educational material, and developing strategies to ensure the adequacy of the Core Curriculum for Surgical Technology.

Meloney's husband of 28 years, Greg, and their three children inspire Meloney daily. In her free time, she likes to travel, especially to Las Vegas, spend time with her family, enjoy being a Mimi, and make memories with her five amazing grandchildren.

Maureen Murphy, CST, FAST

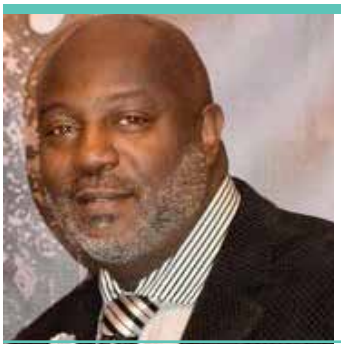
Maureen has been a surgical technologist for 11 years, graduating from GateWay Community College in Phoenix, AZ with her Associates of Applied Science in Surgical Technology. She has been an AST member since 2012. Shortly after graduation, she started working as a CST at Banner Ironwood Medical Center in Queen Creek, AZ. She has continued to work there as a CST part time, while branching out to work PRN at Surgery Centers in the Phoenix area. While in school, her director encouraged her to return to teach the future CSTs when she had been out in the field for 5 years. In 2018, she returned to the halls of GateWay Community College again, this time as an adjunct faculty and helped out in several of the Surgical Technology lab classes. In August of 2021, Maureen took a full-time faculty position at GateWay Community College and teaches the Surgical Technology and Hospital Central students about sterilization and instruments and the first year Surgical Technology students about their beginning instrument handling and procedures.

Maureen has been part of the Arizona State Assembly since 2013 and has served as president, vice president, secretary and several terms as a director. She currently is finishing her first term as AZSA treasurer. As an instructor and an AZSA board member, she believes that we need to encourage our new CSTs to become "involved at the state level on the state assembly because they are the future of our profession."

Maureen is in her second term on the Education and Professional Standards Committee. She joined the committee in July of 2022 and has been loving planning the Educator's Conference and the student track at the AST national conference. As part of the committee she has been involved with the CE approval process, reviewing questions for study guides for the CST exam, and reviewing the AST standards.

Maureen has recently decided to go back to school to get her RN license. She is currently enrolled in the CNA program at GateWay Community College so that she can continue in the nursing program. She would love to continue in the Operating Room as a circulator with the ability to still scrub and maybe even obtain her RNFA.

In her free time, she enjoys reading, playing videos games and board games with family and friends. She loves to binge watch the medical shows like Grey's Anatomy and ER and pick out all the medical inaccuracies.



Tyronne Johnson, CST, CRCST, CHL, EMBA

Tyronne is serving his first term as an EPSC member for AST. He started his surgical technology career in the US Army in 1990. Since attaining certification as a surgical technologist in 1995, Tyronne has been a stalwart presence in the operating room, lending his expertise to countless surgical procedures for over two decades.

Currently serving as the Chair of the Allied Health Mental Health and Human Services department at Kingsborough Community College, Tyronne plays a pivotal role in shaping the next generation of healthcare professionals. Tyronne has also served as a program director for Surgical Technology and as a former Sterile Processing Manager at Flushing Hospital for over 13 years. In these various roles, he has leveraged his extensive experience to develop and refine curriculums that meet the highest standards of excellence.

Tyronne's academic journey is a testament to his commitment to personal and professional growth. He earned his Bachelor of Arts in Business Administration from Ashford University in 2013, laying the foundation for his understanding of healthcare management and administration. Building on this foundation, he pursued and earned his Executive MBA in Healthcare Administration from Baruch College in 2020, further solidifying his expertise in the field.

John Hadley, CST, FAST

John is the Program Director for Surgical Technology at Des Moines Area Community College in Des Moines, Iowa. He graduated from the Surgical Technology Program in Rochester, Minnesota in 1988 and spent 30 years working at the Mayo Clinic. John primarily worked in cardiac, vascular, and thoracic surgery. He was also a member of the heart and lung transplant team, and the liver transplant team.

In 2014, he became a faculty instructor for Des Moines Area Community College and has been the Program Director since 2017. He spent several years on the board of directors for the Iowa State Assembly and fulfilled two terms as president. John lives in Johnston, Iowa and enjoys remodeling homes, adventurous travel, and all things outdoors. He is interested in fostering the growth of future CSTs and empowering the profession as we drive into the future.

John chose to volunteer for the Education and Professional Standards Committee to learn more about education in our field on a national level. He is excited to work with a committee that deeply cares about the future of our profession.

His passion is "giving back" to the field of surgical technology and providing educational opportunity for new surgical technologists.

Stefanie Vaughn, CST, FAST

Stefanie Vaughn, CST, FAST, has been the Program Director of Surgical Technology at Angelina College in Lufkin, Texas, since 2016. She began her career in 2002 after earning an associate in applied science in surgical technology from Tyler Junior College. In August 2020, she completed a Bachelor of Applied Science in Surgical Services Management from Wayland Baptist University. Currently, Stefanie is pursuing a Master of Education in Applied Digital Learning and Leadership at Lamar University.

Stefanie is actively involved in professional organizations, serving on AST's Educational Programs and Standards Committee and previously holding various roles with the AST Texas State Assembly. She has contributed to the field through her written work, as a reviewer for "Surgical Instrumentation" by Nancy Marie Phillips. She has also been a speaker at several AST educators and national conferences.

With a 23-year career spanning various surgical specialties, Stefanie's primary passion lies in helping others. More recently, she has discovered a passion for teaching, where she focuses on shaping the future of surgical technologists and mentoring new program directors and instructors.

Jeff Walker, CST, FAST

Jeff Walker is the Regional Director of Operations for an orthotics and prosthetics company based in Las Vegas, Nevada. He holds a master's degree from the University of Nevada, Las Vegas, with a focus on healthcare administration. In 2009, Jeff earned his associate's degree in surgical technology from the College of Southern Nevada.

In 2023, Jeff was honored with the Fellowship of the Association of Surgical Technologists (AST). He currently serves on the national AST's Educators and Professional Standards Committee and has held various leadership roles on the AST board in Nevada. Jeff is passionate about education, student development, and advancing the field of surgical technology nationwide. His commitment to healthcare and surgery was ignited by his first medical mission trip in 2003, and he has since participated in numerous mission trips across the country.

Outside of his professional life, Jeff's greatest joy comes from his family: his wife and three boys. He spends his weekends cheering them on at various sports events. In his free time, Jeff enjoys running, exploring new culinary experiences, and savoring a good whiskey.

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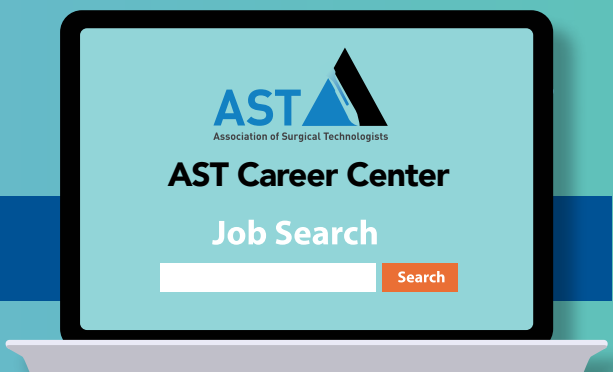

New European Blood Pressure Guidelines Aligned with U.S. Guidelines

OF INTEREST IN THE MEDICAL ARENA

The European Society of Cardiology (ESC) published updated guidelines recommending a new systolic blood pressure (BP) target of 120 mm Hg to 129 mm Hg. The new European guidelines are now more aligned with the American guidelines that should contribute to reducing confusion among clinicians as well as patients. Both sets now recommend a target BP of less than 130/80 mm Hg for most people. Eugene Yang, MD, chair of the American College of Cardiology's Hypertension Writing Group explained, "I think the Europeans have now embraced this more aggressive target because there are many more studies now showing that these lower blood pressure levels do lead to a reduction in cardiovascular events."

The updated ESC guidelines now recommend 75 minutes of vigorous-intensity aerobic exercise per week replacing the previous recommendation of 2.5 hours per week of moderate-intensity aerobic exercise.

A frailty assessment is now included in the guidelines matching the U.S. guidelines as well as less aggressive targets for people who are in poor health or older than 85 years. As Dr. Yang said, "Again, this is like the American guidelines, which have no age cutoffs … with the caveat that clinical judgement may be needed for individuals who are institutionalized."

Reference: Hughes S. New blood pressure guidelines lower treatment target. *Medscape Medical News*, 2024. https://www.medscape.com/viewarticle/new-blood-pressure-guidelines-lower-treatment-target-2024a1000fvc

Endotest Saliva Diagnostic Test for Endometriosis

The Endotest saliva diagnostic test may be a turning point for women in preventing the diagnostic delay of endometriosis. The average diagnostic delay for the disease is still between seven and ten years. Most endometriosis cases are superficial, millimetric, and peritoneal forms that continue to be poorly diagnosed by imaging modalities. According to a study by the EndoFrance and ENDOmind associations, 65% of women with endometriosis had to undergo numerous examinations, including a minimum of three ultrasounds and 16.25% of the patients required surgery to obtain a definitive diagnosis.

The Endotest saliva diagnostic test could change all of this. The test analyzes the salivary microRNAs. Endometrial samples have confirmed the presence of microRNAs that are specific to the disease's pathophysiology. Some of the microRNAs are encapsulated, which allows them to be detected in the saliva.

In December 2023, the French Health Authority confirmed the clinical utility of the test. A new study will begin at 80 level 2 and 3 centers in France to further evaluate its use in clinical practice. For a symptomatic female, imaging remains the first step, but if the imaging results are negative, the Endotest saliva diagnostic test will be administered. Professor Sofiane Bendifallah, obstetrician and gynecologist at the American Hospital in Paris, presented information about the test at the Pari(s) Santé Femmes Congress in June 2024. He said, "This completely changes the nature of dialogue with these women, especially when imaging hadn't identified the disease, leading to ongoing diagnostic uncertainty. With the test's accuracy, women will have more confidence in the results and the proposed care pathway."

Reference: Guignot, C. Endometriosis: Saliva test promises faster diagnosis. *Medscape UK*, 2024. https://www.medscape.co.uk/viewarticle/endometriosis-saliva-test-promises-faster-diagnosis-2024a1000ce2

What is Driving the Endoscopic Gastrointestinal (GI) Device Market?

As medical professionals, CSTs know the advantages that GI endoscopes present including decreased patient discomfort during procedures and increased diagnostic accuracy, particularly due to the advances in technology that provide the surgeon with the ability to better diagnose and treat patients.

The U.S. GI endoscope market has a value of approximately $1.2 billion and is projected to reach about $1.5 billion by 2030, indicating a significant growth that is expected to continue past 2030.[1]

In 2023, according to Salempoor and Zamanian, the largest portion of the GI endoscope market was reusable colonoscope because of the large number of annual procedures. The second largest portion was the reusable gastroscope market, again, due to the large annual number of upper endoscopy procedures. The third largest portion was the ultrasound endoscope market driven by the increase in endoscopic ultrasound and ERCP procedures.

According to the American Cancer Society, there were approximately 106,970 colon cancer cases and 46,050 rectal cancer cases in the U.S. in 2023.[2] The American Society of Gastrointestinal Endoscopy reports that colorectal cancer is the third leading cause of cancer deaths in the U.S.[3] However, because of the media campaigns by professional associations and government divisions, people have become less shy and realize that a colonoscopy may save their life. The increase in screening programs has contributed to the significant growth of the GI endoscope market.

Technological advancements in improving the endoscopes have made them more effective. Recently, HD+ has been introduced into the market that provides advanced magnification resulting in an increase in the detection rate of polyps.[1] This aligns with advancements that have been made in computer technology. Distal chips and full high-definition technology greatly improve the image quality to provide the surgeon with the ability to achieve a more accurate diagnosis.[1]

With an aging population and the increased attention on screening, the emphasis on technology to improve GI endoscopes is anticipated to continue.[1] The drive to produce smaller, but more efficient endoscopes contribute to safer and better surgical patient outcomes.

Reference:

1. Salempoor H., Zamanian K. The growing U.S. market for endoscopic gastrointestinal devices. *Med Device Online,* 2024. https://www.meddeviceonline.com/doc/the-growing-u-s-market-for-endoscopic-gastrointestinal-devices-0001
2. American Cancer Society. Colorectal cancer statistics: How common is colorectal cancer? n.d. https://www.cancer.org/cancer/types/colon-rectal-cancer/about/key-statistics.html
3. American Society for Gastrointestinal Endoscopy. Patient information. n.d. https://www.asge.org/home/for-patients/patient-information/understanding-colonoscopy#:~:text=Colorectal%20cancer%20is%20the%20third%20leading%20cause%20of,would%20save%20at%20least%2030%2Cooo%2olives%20each%20year

Research Shows Transperineal Biopsies are Safer than Transrectal Route

The results of a study published on 19 September 2024 in the *JAMA* journal, lead author Jim Hu, MD, MPH, urologic consultant at New York Presbyterian and Weill Cornell Medicine in New York City, reported that transperineal prostate (TP) biopsies should be the standard of care because no infections occurred in the TP group of patients as compared to the transrectal (TR) group.

The randomized trial was conducted over a three-year period ending in March 2024 at ten centers that included patients with a suspicion of prostate cancer. 372 patients were assigned to TP biopsy without antibiotic pretreatment and 370 patients to TR biopsy with antibiotics. Six infections occurred in the TR group, primarily urinary tract infections, that were resolved without complications. Dr. Hu indicated that other studies reported infection rates of 5% to 7% in TR biopsy patients. However, the TR patients in this current study received targeted prophylaxis with rectal culture screening for fluoroquinolone-resistant bacteria. Hu said, "We believe this is why our transrectal biopsy infection risk is much lower than other studies" and TP biopsy, therefore, contributes to the antibiotic stewardship practices.

Richard Szabo, MD, clinical professor at the University of California – Irvine, who conducts safety studies on prostate biopsies, said TP biopsies help urologists detect clinically significant prostate cancer anteriorly and at the apex of the gland, where the TR method can miss some cancer.

The American Urological Association and National Comprehensive Cancer Network guidelines equally support TP and TR biopsies. However, the European Association of Urologists guidelines recommend TP biopsies.

Reference:

Wolinsky H. Transperitoneal biopsies show superior safety over transrectal method. *Medscape Medical News,* 2024. https://www.medscape.com/viewarticle/transperineal-biopsies-show-superior-safety-over-transrectal-2024a1000h3c

UPCOMING PROGRAMS

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ALABAMA STATE ASSEMBLY

Program Type: Annual Meeting/Elections
Date: March 8, 2025
Title: Marching Into Excellence
Online Registration at: alabamaastinfo.org
Location: Brookwood Baptist Medical Center, 2010 Brookwood Medical Center Dr, Birmingham, AL 35209
Contact: Abigail Jones, 7839 County Road 1, Daleville, AL 36322, 334-389-1250, abigailcarter8614@gmail.com
CE Credits: 6

GEORGIA STATE ASSEMBLY

Program Type: Annual Meeting/Elections
Date: March 8, 2025
Title: Knowledge in Bloom
Online Registration at: ast-gasa.com
Location: Gwinnett Technical College, 5150 Sugarloaf Pkwy, Lawrenceville, GA 30043
Contact: Erin Baggett, PO Box 109, Auburn, GA 30011, 678-226-6943, gas-awebmaster@gmail.com
CE Credits:7

INDIANA STATE ASSEMBLY

Program Type: Workshop
Date: March 1, 2025
Title: ISA Spring Conference 2025
Location: Ivy Tech Community College Terre Haute, 8000 S Education Dr, Terre Haute, IN 47802
Contact: Lora Hofmann, PO Box 421673, Indianapolis, IN 46242, 812-201-9563, lhofmann1@ivytech.edu
CE Credits: 6

NEW MEXICO STATE ASSEMBLY

Program Type: Annual Meeting/Elections
Date: March 1, 2025
Title: Spring Ahead Conference, Business Meeting & Elections
Location: UNMH North Campus; Domenici Center Auditorium, 1001 Stanford Dr NE, Albuquerque, NM 87193
Contact: Ruth Borah, PO Box 66496, Albuquerque, NM 87193, 848-391-3661, ruth.kerrjusinski@gmail.com
CE Credits: 5

NORTH CAROLINA STATE ASSEMBLY

Program Type: Annual Meeting/Elections
Date: March 1, 2025
Title: NCSA Spring Workshop
Location: Duke Health Raleigh Campus, 3400 Wake Forest Road, Raleigh, NC 27609
Contact: Brittany Toth, PO Box 902, Mooresville, NC 28115, 507-720-1892, ncsaast@gmail.com
CE Credits: 6

OHIO STATE ASSEMBLY

Program Type: Annual Meeting/Elections
Date: April 11-13, 2025
Title: Best in the Midwest
Location: Renaissance Columbus Westerville-Polaris Hotel, 409 Altair Parkway, Westerville, OH 43082
Contact: Michael Pickering, 614-439-3428, ohioast@gmail.com
CE Credits: 15

TENNESSEE STATE ASSEMBLY

Program Type: Annual Meeting/Elections
Date: March 1-2, 2025
Title: 25 Years of Excellence
Location: TCAT Smyrna Campus/ Nissan Training Facility, 663 Ken Pilkerton Dr, Smyrna, TN 37167
Contact: Ellen Wood, 1344 Copperstone Lane, Knoxville, TN 37922, 865-283-5901, ellenwoodtnast@gmail.com
CE Credits: 12

STATE ASSEMBLY ANNUAL BUSINESS MEETINGS

Members interested in the election of officers & the business issues of their state assembly should ensure their attendance at the following meetings.

ALABAMA
Birmingham
March 8, 2025
Annual Meeting
2025 BOD Elections
& 2025 Delegate
Elections

GEORGIA
Lawrenceville
March 8, 2025
Annual Meeting
2025 BOD Elections
& 2025 Delegate
Elections

NEW MEXICO
Albuquerque
March 1, 2025
Annual Meeting
2025 BOD Elections
& 2025 Delegate
Elections

NORTH CAROLINA
Raleigh
March 1, 2025
Annual Meeting
2025 BOD Elections
& 2025 Delegate
Elections

OHIO
Westerville
April 11-13, 2025
Annual Meeting
2025 BOD Elections
& 2025 Delegate
Elections

TENNESSEE
Smyrna
March 1-2, 2025
Annual Meeting
2025 BOD Elections
& 2025 Delegate
Elections

Program Approvals: Submit the *State Assembly Program Date Request Form A1* no less than 120 days prior to the date(s) of the program for AST approval. The form must be received prior to first (1st) of the current month for program publication in the next month of the AST monthly journal *The Surgical Technologist*. The *Application for State Assembly CE Program Approval A2* must be received at least thirty (30) days prior to the date(s) of the program for continuing education credit approval. An application submitted post-program will not be accepted; no program is granted approval retroactively.

Contact stateassembly@ast.org or 800.637.7433, ext. 2547.

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