



# Initial experience from a multidisciplinary pediatric salivary gland disorder clinic



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## ABSTRACT

**Objective:** This study is the first in the literature to characterize and detail the clinical and surgical experience of one of the few multidisciplinary salivary gland disorder clinics in North America.

**Methods:** This is a retrospective chart review of a descriptive nature, including patient information from February 2013 to August 2014. The Salivary Gland Disorder Clinic (SGDC) is located at Nationwide Children's Hospital, a public academic hospital. All patients seen at the SGDC were included in this study, 54 in total. Patients were seen for any salivary gland disorder presentation, ranging from sialorrhea to glandular masses. **Results:** A total of 70.4% of patients presented to the SGDC with a chief complaint of sialorrhea. Nearly 28% had previously experienced documented aspiration, and drooling severity and frequency was 4.06 and 3.3 on the Thomas-Stonell and Greenberg Drooling Rating Scales. 50% of patients presented with neurologic comorbidities and 25.9% with aerodigestive tract anatomic defects. Over 35% of patients had previously attempted medical treatment and 31.5% had no prior treatment attempts. 87% of all patients were offered further treatment options, including interventional, surgical, medical, and conservative measures.

**Conclusions:** Pediatric salivary gland disorders, especially sialorrhea, can profoundly impact overall health and quality of life. Appropriate management of this symptom requires expert training and knowledge of the upper aerodigestive tract anatomy and appropriate treatment modalities. Our study demonstrates that there is community need for a centralized salivary gland disorder clinic given the complex comorbidities and social challenges that face this population. Many patients present with great risk for aspiration-related complications and the vast majority are offered new treatment options.

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## 1. Introduction

In comparison to the counterpart adult population, salivary gland diseases are not as common in the pediatric population. Furthermore, due to the smaller scale anatomy present in children and the careful consideration that must be given to their future growth potential, advancements in diagnostic and treatment modalities must be implemented with caution.

### 1.1. Categorization of pediatric salivary gland disorders

In general, pediatric salivary gland related complaints can be categorized as either due to infectious etiologies, non-infectious masses, or due to complaints of sialorrhea.

In regards to infectious etiologies, sialadenitis can either be acute or chronic. Acute cases are commonly due to bacterial or viral infections, with mumps being the most common inflammatory salivary gland disorder of childhood [1]. Chronic cases are often due to congenital disorders or immunological reactions. Chronic recurrent parotitis, or juvenile recurrent parotitis (JRP) is the second most common inflammatory salivary gland disorder of childhood. Sialolithiasis is thought to have a dual anatomic and infectious cause. It is extremely rare in children compared to adults (accounting for 3% of total cases) with management options including basket retrieval, laser fragmentation, and gland excision [2].

Salivary gland masses can be divided into benign and malignant neoplasms. Benign salivary gland masses occur in 1.8–3.3% of the pediatric population, and include ranula, pleomorphic adenoma, hemangioma, and lymphatic malformations [3]. Malignant salivary gland neoplasms account for less than 5% of all salivary gland cancer in the pediatric population. Complete resection is the mainstay of therapy, with adjuvant and neoadjuvant treatment utilized as needed [4].

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Finally, sialorrhea can be further categorized based on severity, with patients either possessing severe aspiration-risk or possessing a threat to social hygiene with little aspiration risk. The “aspiration risk” category importantly encompasses children with neurological impairment, as up to 28% of neurologically impaired children suffer from continuous drooling [5]. Rather than due to intrinsic salivary gland abnormalities, this subset of patients suffer from sialorrhea due to poor oral motor control and gross swallowing dysfunction [6]. Another important subset of patients in the “aspiration risk” category are those with major anatomic defects, including children with oro-facial resections due to previous disease processes and those with congenital oral/dental deformities.

With regards to the mild variant “social hygiene risk” category, common etiologies include physiologic drooling (especially in kids younger than 5 or sleeping children), poor lip competency and oral motor skill deficiency, poor head posturing, painful swallowing secondary to infectious etiology, and predisposing emotional state [5]. Management options depend on underlying etiology, and include conservative methods such as oral motor therapy, biofeedback techniques, local and systemic pharmacotherapy. Interventional options are developing, and include salivary gland ablation or chemodenervation (botulinum toxin). Surgical options include duct relocation, duct ligation, and glandular excision [6]. Severe, refractory cases in patients with aspiration or pulmonary compromise may even necessitate tracheostomy placement or laryngotracheal separation.

The well-trained pediatric otolaryngologist must be proficient at managing pediatric patients presenting with salivary gland complaints. Particular attention is required for those with sialorrhea, as the consequences can be underappreciated. Drooling can be especially troublesome for caregivers, as they are responsible for continuously changing clothing and bibs, and must prevent soiling of clothes and household items. These consequences can concomitantly limit the child’s social development and result in pathologic psychological issues. Furthermore, beyond an aspiration risk, sialorrhea can also lead to maceration or excoriation of the surrounding skin, can predispose to perioral infections, and, though rare, can even lead to fluid and electrolyte depletion [7].

### 1.2. Salivary gland disorder clinic operations

For the past 2 years we have held a monthly Salivary Gland Disorders Clinic (SGDC) at the Nationwide Children’s Hospital (NCH) Department of Pediatric Otolaryngology in Columbus, Ohio. The SGDC serves to provide comprehensive medical and surgical management for pediatric patients suffering from salivary gland disorders. The clinic’s main focus is on the management of sialorrhea, however, referrals are welcome for all salivary gland concerns. This multidisciplinary clinic is staffed by an attending pediatric otolaryngologist, a speech-language pathologist and a pediatric registered nurse, and includes collaboration with physical medicine and rehabilitation and pulmonary medicine physicians as well as complex healthcare staff.

The primary role of the speech-language pathologist in the SGDC is to assess speech and language skills, oral motor skills, feeding skills, swallowing skills, and to provide recommendations related to communication, feeding, and swallowing. During the assessment, the speech-language pathologist conducts a thorough parent/patient interview to obtain a complete case history and concerns regarding drooling. Communication status is evaluated to determine if patient is non-verbal or verbal. Cognitive level, receptive and expressive language skills, speech/articulation skills, and voice are assessed. An oral mechanism exam is performed along with a bedside swallowing evaluation if the patient is currently eating by mouth. A Fiberoptic Endoscopic Evaluation of

Swallowing (FEES) is available to assess swallowing skills and management of secretions if necessary. Impressions and recommendations are established after all information has been gathered. The speech-language pathologist collaborates with the pediatric otolaryngologist regarding treatment recommendations for the specific patient. Recommendations may include further assessment of speech and language skills; referral for Video Fluoroscopic Swallow Study (VFSS); treatment for oral motor, feeding, and swallowing difficulties to improve oral motor control; and treatment for improving awareness of drooling if appropriate (behavior modification).

Referrals for evaluation are made through local pediatricians, speech-language pathologists, physical medicine and rehabilitation physicians, neurologists, pulmonologists, complex care physicians and local otolaryngologists seeking expert help with complex patients. Initially, at the outset of this service, patient census was low, with 2–3 patients present at each clinic day. However, as awareness both in the community and within the hospital settings grew, the patient census grew steadily, with 5–8 patients presenting at each clinic day within only two years of the service’s inception.

This article will be the first in literature to detail the epidemiological, historical, clinical, treatment and follow-up related course of patients presenting to a salivary gland disorder clinic. The article will further provide an algorithm to be utilized for stratification of salivary gland disorder patients, as well as recommendations for need for similar practices elsewhere.

## 2. Methods and material

This Institutional Review Board (IRB) approved retrospective chart review analyzes records from 54 patients who were evaluated in Nationwide Children’s Hospital’s Salivary Gland Disorder Clinic between February 2013 and August 2014. Patient specific information obtained from the electronic medical records system included age, gender, comorbid conditions, dates of testing, referral source, clinical diagnosis, presence of aspiration, previous treatment efforts, drooling severity, drooling frequency, and new treatment recommendations. Drooling severity and frequency were assessed via the Thomas-Stonell and Greenberg Drooling Rating Scales. All patients presenting for management of salivary gland disorders to the SGDC at Nationwide Children’s Hospital were included in the analysis. There were no exclusion criteria.

## 3. Results

Salivary Gland Disorder Clinic records for 54 patients undergoing evaluation between February 2013 and August 2014 were entered into the database. There were 27 males and 27 females. The average age at presentation was 8.74 years, with a range of 1–22 years. Presenting clinical pictures are outlined in Table 1 and included sialorrhea in 38 patients (70.4%), acute/chronic infection in 7 patients (12.9%), sialolithiasis in 4 patients (7.4%), parotid abscess in 2 patients (3.7%), other etiologies in 2 patients (3.7%), and parotid tumor in 1 patient (1.9%). Importantly, 15 patients (27.8%) had previously documented aspiration, as verified by video swallow study or via clinical history of aspiration pneumonia

**Table 1**  
Diagnostic data.

Diagnostic category/clinical picture	Number of patients (%)
Sialorrhea	38 (70.4%)
Infection (acute or chronic)	7 (12.9%)
Sialolithiasis	4 (7.4%)
Parotid abscess	2 (3.7%)
Other—unrelated to salivary pathology	2 (3.7%)
Parotid tumor	1 (1.9%)

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