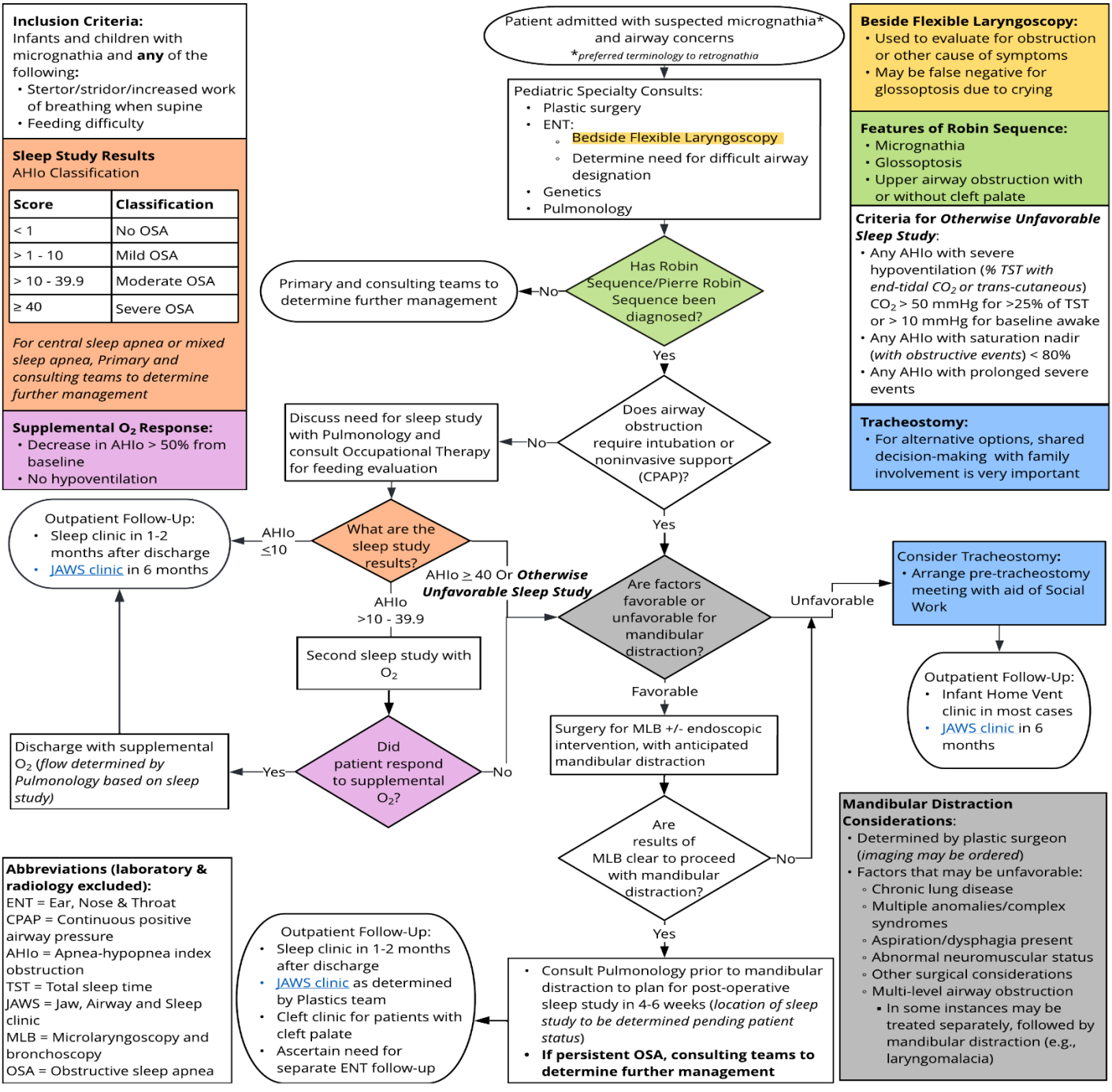
Micrognathia
Care Process Model Synopsis

Micrognathia Algorithm



** These products do not establish a standard of care to be followed in every case. It is recognized that each case is different, and those individuals involved in providing health care are expected to use their judgment in determining what is in the best interests of the patient based on the circumstances existing at the time. It is impossible to anticipate all possible situations that may exist and to prepare guidelines for each. Accordingly, these products should guide care with the understanding that departures from them may be required at times.*

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Objective of Care Process Model

The objective of the Micrognathia Care Process Model (CPM) is to provide care standards for the infant or child admitted to the hospital with suspected micrognathia and associated breathing or feeding difficulties. The Micrognathia CPM provides guidance regarding recommended specialty consultation, diagnostic management, intervention, and follow-up to minimize variation in care.

Background

Micrognathia, characterized by a lower jaw which is smaller in size than expected, can occur in isolation or as part of more than 700 genetic syndromes (Boyadjiev Boyd, 2022). One such syndrome, of which micrognathia is commonly associated and one of the triad of symptoms, is Pierre Robin sequence or Robin sequence (Hsieh & Woo, 2019). Pierre Robin sequence occurs in 1 in 8,500 to 1 in 14,000 newborns per year (Hsieh & Woo, 2019). Due to advances in technology, micrognathia can be detected during gestation (Antonakopoulos & Bhide, 2019). During prenatal detection, the prevalence of micrognathia is 1 in 1,500 (Antonakopoulos & Bhide, 2019). When factoring in the prevalence, whether in isolation or when associated with a genetic syndrome, micrognathia is considered relatively common in infants (Antonakopoulos & Bhide, 2019; Boyadjiev Boyd, 2022; Hsieh & Woo, 2019).

Micrognathia impacts breathing, feeding, and sleeping (American Academy of Pediatrics [AAP], 2015). Infants and children diagnosed with micrognathia often develop sleep apnea due to the retroposition of the tongue that is typically associated with the condition, rendering many to develop severe obstructive sleep apnea (AAP, 2015; Thimmappa et al., 2009). As a result, infants and children diagnosed with micrognathia may demonstrate failure to thrive, daytime sleepiness, pulmonary hypertension, malnutrition, and have a higher mortality risk due to airway obstruction, particularly when undetected or prolonged (Thimmappa et al., 2009).

Micrognathia severity varies (AAP, 2015). Infants and children with micrognathia demonstrate symptoms which can range from mild to severe that require longitudinal follow-up (AAP, 2015; American Cleft Palate-Craniofacial Association [ACPA], 2018). As a result, early diagnosis and a care process consisting of a coordinated interdisciplinary team approach is essential to the physical and psychosocial well-being of the child and family (AAP, 2015; ACPA, 2018).

Target Users

- Physicians (Pulmonology, Neonatology, Plastic surgery, Otolaryngology or Ear, Nose, and Throat (ENT), Genetics, Primary Care)
- Advanced Practice Providers
- Nurses
- Feeding specialists (Occupational Therapist)
- Respiratory Therapists

Target Population

Inclusion Criteria

- Infants and children admitted with micrognathia and **any** of the following:
  - Stertor, stridor, or increased work of breathing when supine
  - Feeding difficulty

Exclusion Criteria

- Infants and children with suspected micrognathia without breathing or feeding difficulties

Practice Recommendations

A clinical practice guideline has not been established to address the care process for infants and children diagnosed with micrognathia. Practice recommendations are based on the expert opinion of providers involved in the interprofessional care of infants and children with micrognathia and airway concerns impacting breathing and feeding.

Additional Questions Posed by the CPM Committee

No clinical questions were posed for this review.

Recommendation Specific for Children's Mercy

Practice recommendations, which were based on expert opinion, include:

- Early detection, involvement, and coordination of an interprofessional team (Neonatology, Plastic surgery, ENT, Genetics, Pulmonology, Occupational Therapist, Respiratory Therapist) to evaluate and develop a comprehensive treatment plan which includes the infant's or child's family in shared decision-making
- Considerations for which mandibular distraction or tracheostomy is recommended
- Outpatient follow-up

Measures

- Utilization of the Micrognathia CPM

Value Implications

The following improvements may increase value by reducing healthcare costs and non-monetary costs (e.g., missed school/work, loss of wages, stress) for patients and families and reducing costs and resource utilization for healthcare facilities.

- Decreased unwarranted variation in care

Potential Organizational Barriers and Facilitators

Potential Barriers

- Variability of acceptable level of risk among providers
- Challenges with follow-up faced by some families

Potential Facilitators

- Collaborative engagement across care continuum settings during Micrognathia CPM development
- High rate of use of CPM

Diversity/Equity/Inclusion

Our aim is to provide equitable care. These issues were discussed with the Committee, reviewed in the literature, and discussed prior to making any practice recommendations.

Power Plans

- The Micrognathia CPM does not have any directly associated power plans

Associated Policies

- The Micrognathia CPM is not directly associated to any Children's Mercy Kansas City policies

Education Materials

- The Micrognathia CPM has no associated educational materials

Care Process Preparation

This product was prepared by the Evidence Based Practice (EBP) Department in collaboration with the Micrognathia CPM Committee composed of content experts at Children's Mercy Kansas City. The development of this product supports the Quality Excellence and Safety initiative to promote care standardization that is evidenced by measured outcomes. If a conflict of interest is identified, the conflict will be disclosed next to the committee member's name.

Micrognathia CPM Committee Members and Representation

- Zarmina Ehsan, MD | Pulmonology | Committee Chair
- Bonnie Sullivan, MD | Clinical Genetics | Committee Member
- Daniel Jensen, MD | Ear, Nose, and Throat (ENT) | Committee Member
- Jeffrey Goldstein, MD | Plastic and Reconstructive Surgery | Committee Member
- Julie Weiner, DO | Neonatology | Committee Member
- Cristine Mills, MSN, RN, NNP-BC | Neonatology | Committee Member

EBP Committee Members

- Todd Glenski, MD, MSHA, FASA | Anesthesiology, Evidence Based Practice
- Kelli Ott, OTD, OTR/L | Evidence Based Practice

Care Process Model Development Funding

The development of this care process model was underwritten by the following departments/divisions: Pulmonology, Clinical Genetics, ENT, Plastic and Reconstructive Surgery, Neonatology, and Evidence Based Practice.

Conflict of Interest

The contributors to the Micrognathia CPM have no conflicts of interest to disclose related to the subject matter or materials discussed in this care process.

Approval Process

- This product was reviewed and approved by the Micrognathia CPM Committee, Content Expert Departments/Divisions, and the EBP Department.
- Products are reviewed and updated as necessary every 3 years within the EBP Department at CMKC. Content expert teams are involved with every review and update.

Review Requested

Department/Unit	Date Obtained
Pulmonology	April 2023
Clinical Genetics	March 2023
ENT	April 2023
Plastics and Reconstructive Surgery	March 2023
Neonatology	April 2023
Evidence Based Practice	April 2023

Version History

Date	Comments
August 2020	Version one (algorithm developed)
May 2023	Version two (algorithm revised, synopsis developed)

Date for Next Review:

- May 2026

Implementation & Follow-Up

- Once approved, the CPM was presented to appropriate care teams and implemented. Care measurements will be assessed and shared with appropriate care teams to determine if changes need to occur.
- Additional institution-wide announcements were made via email, hospital website, and relevant huddles.

Disclaimer

When evidence is lacking or inconclusive, options in care are provided in the guideline and the power plans that accompany the guideline.

These guidelines do not establish a standard of care to be followed in every case. It is recognized that each case is different, and those individuals involved in providing health care are expected to use their judgment in determining what is in the best interests of the patient based on the circumstances existing at the time.

It is impossible to anticipate all possible situations that may exist and to prepare guidelines for each. Accordingly, these guidelines should guide care with the understanding that departures from them may be required at times.

References

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