

TEXAS CHILDREN'S HOSPITAL
EVIDENCE-BASED OUTCOMES CENTER
Infectious Cervical Lymphadenitis
 Evidence-Based Practice Course Evidence Summary

Inclusion Criteria

- Age 1-18 years old
- Unilateral cervical lymph node swelling
- Concern for infectious etiology (moderate to severe erythema, tenderness, or warmth), with or without fever
- <3 weeks of symptoms

Exclusion Criteria

- Signs/Symptoms of peritonsillar or retropharyngeal abscess
- Bilateral cervical swelling
- Concern for mycobacterial etiology (TB or non-tuberculosis)
- Sepsis, immunodeficiency, current diagnosis of malignancy
- Pregnancy
- Signs/Symptoms of airway compromise

Background

Acute cervical lymphadenitis is a common reason for hospital admission among children. Management may vary based on severity; some children improve on antibiotic therapy alone while others require surgical drainage. At TCH, there is currently no clinical guideline for management of acute cervical lymphadenitis.

Critically Analyze the Evidence

The **GRADE criteria** were used to evaluate the quality of evidence presented in research articles reviewed during the development of this guideline. The table below defines how the quality of evidence is rated and how a strong versus a weak recommendation is established.

Recommendation	
STRONG	Desirable effects clearly outweigh undesirable effects or vice versa
WEAK	Desirable effects closely balanced with undesirable effects
Quality	Type of Evidence
High	Consistent evidence from well-performed RCTs or exceptionally strong evidence from unbiased observational studies
Moderate	Evidence from RCTs with important limitations (e.g., inconsistent results, methodological flaws, indirect evidence, or imprecise results) or unusually strong evidence from unbiased observational studies
Low	Evidence for at least 1 critical outcome from observational studies, from RCTs with serious flaws or indirect evidence
Very Low	Evidence for at least 1 critical outcome from unsystematic clinical observations or very indirect evidence

PICO Question 1: In children age 1-18 years who present to the ED with acute (<3 weeks duration) unilateral single cervical lymph node enlargement, is ultrasound (compared to CT or no imaging) better for determining presence of an abscess and/or the need for surgical intervention?

Recommendation(s): Strong recommendation with low quality evidence that in patients with acute inflammatory cervical lymphadenopathy in whom abscess is suspected, ultrasound is the appropriate initial imaging modality if imaging is needed. ⁽¹⁻⁹⁾ Abscess may be more likely to be present if the patient has failed antibiotic therapy. In patients in whom deep neck infection (retropharyngeal, etc.) is suspected, CT is the appropriate initial imaging modality. Symptoms more consistent with deep neck infection, besides physical exam findings, include difficulty moving neck, toxic appearance, breathing difficulty/stridor, etc.

Remarks: Ultrasound is an appropriate study for identifying soft tissue abscess collection in children who present with lymphadenitis. Further history and exam findings may raise concern for deep neck infection, in which case ultrasound would not be suitable. Factors related to need for surgical drainage are fluctuance, previous antibiotic use prior to admission, and younger age (<4 years).

Many studies examine the management of pediatric neck masses in relation to different imaging modalities. Ultrasound has been shown to be highly sensitive in identifying fluid collection. ⁽⁶⁾ CT scan was found to have low sensitivity and specificity. ⁽¹⁾ However, one

retrospective study showed that use of CT scan can be useful as an initial evaluation method for patients suspected to have a deep neck infection. ⁽⁵⁾ The American College of Radiology Appropriateness Criteria for Neck Mass/Adenopathy (2012) asserts that in children up to age 14 with solitary or multiple neck mass and is afebrile, ultrasound use is appropriate. ⁽⁸⁾ They further assert that ultrasound is also appropriate in this same group but with presence of fever, unless deep neck infection is suspected; CT scan is appropriate when deep neck infection is suspected. The Italian Society of Pediatric Infectious Diseases, Italian Society of Pediatric Otorhinolaryngology, and the Italian Society of Preventive and Social Pediatrics Management of Pediatric Cervical Lymphadenopathy (2015) is a clinical guideline that asserts that ultrasound should not be performed for unilateral or bilateral with diameter ≤ 2 cm with no inflammatory signs, and recommends watchful waiting. ⁽⁹⁾ If inflammatory signs are present, they recommend performing ultrasound and starting oral amoxicillin-clavulanate. In unilateral or bilateral lymphadenopathy greater than 2 cm, ultrasound should still be performed. Factors relating to early drainage are younger age group, female gender, longer duration of swelling, and fluctuance, and erythema on exam. ⁽⁴⁾ In this study, prior antibiotic use was not an independent predictor of early drainage. Another study that retrospectively reviewed ER visits for neck infections found that fluctuance, age <4 years, and previous antibiotic use were factors related to need for surgical drainage. ⁽⁷⁾

PICO Question 2: In children age 1-18 who present to with acute unilateral cervical swelling most suspicious for lymphadenitis +/- abscess, is surgical intervention, compared to medical management alone, superior for achieving full resolution of symptoms?

Recommendation(s): Strong recommendation with low quality evidence for the following: ^(7,9-11)

1. If clinical suspicion for abscess is low (e.g., no fluctuance on exam, no previous or ongoing antibiotic treatment for current infection, and age >4 years), management should include initiation of appropriate antibiotic and follow up within 48 hours to monitor progress. If clinical suspicion for abscess exists, proceed with imaging and/or ENT consultation.
2. For patients on appropriate antibiotic therapy for 48 hours with no improvement, or with clinical worsening, obtain initial or repeat ultrasound and ENT consult to assess for abscess formation and indications for surgical management.
3. Surgical management may not be indicated for all patients with abscess formation; ENT consultation is warranted when abscess is suspected on physical exam, or when abscess is confirmed with imaging.

For children who present to outpatient clinics or the emergency department, imaging to determine if surgical intervention is necessary (i.e., abscess formation) should be conducted for patients with exam concerning for abscess formation, and ultrasound should be obtained for patients with age <4 years, fluctuance on physical exam, or previous antibiotic usage for the current infection, as these factors are significantly associated with ultimate abscess formation and surgical drainage. ⁽⁷⁾ Parenteral antibiotics without surgical intervention may be effective in some patients, symptomatic improvement should be expected within 48 hours of treatment. ⁽¹⁰⁾ Surgical intervention may not be indicated for all patients with abscess formation, as medical management in some patients has been shown to be as effective. ⁽¹¹⁾ ENT consult to determine necessity of surgical management would be warranted in the case of a patient with abscess formation or no signs of improvement after 48 hours of appropriate antibiotic therapy.

Critical Points of Evidence

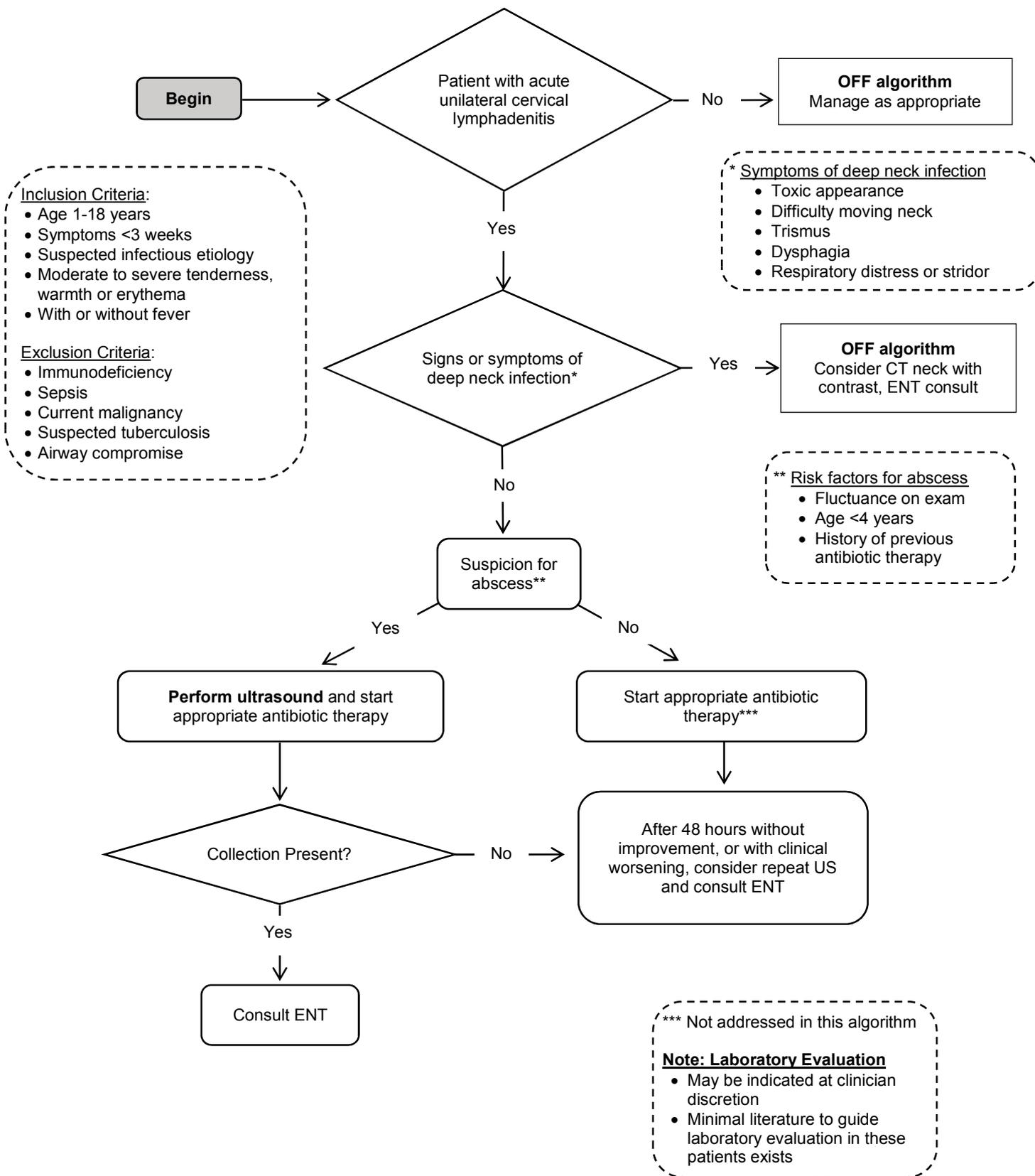
Evidence Supports

- Ultrasound is the appropriate initial imaging modality for patients age 1-18 years with acute onset unilateral cervical lymphadenopathy in whom imaging is needed for the detection of an abscess. ⁽¹⁻⁹⁾ – Strong recommendation, low quality evidence
- For patients with: age <4 years old, fluctuance on physical exam, or previous antibiotic usage for current infection presenting with moderate or severe signs/symptoms of cervical lymphadenitis, consider ultrasound as these factors increase risk of abscess. ^(7,9-11) – Strong recommendation, low quality evidence
- For patients on appropriate antibiotic therapy with no improvement, or with worsening, after 48 hours, obtain initial or repeat ultrasound and ENT consult to assess for abscess formation and indications for surgical management. ^(7,9-11) – Strong recommendation, low quality evidence
- Surgical management may not be indicated for all patients with abscess formation, ENT consultation is warranted. ^(7,9-11) – Strong recommendation, low quality evidence

Evidence Against

- The use of CT or MRI to evaluate for the presence of abscess in patients age 1-18 years with acute onset unilateral cervical lymphadenopathy in whom no signs or symptoms of deep neck infection are present. ⁽¹⁻⁹⁾ – Strong recommendation, low quality evidence

TCH Evidence-Based Outcomes Center Clinical Algorithm for the Management of Acute Cervical Lymphadenitis



References

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Clinical Standards Preparation

This clinical standard was prepared by the Evidence-Based Outcomes Center (EBOC) team in collaboration with content experts at Texas Children's Hospital. Development of this clinical standard supports the TCH Quality and Patient Safety Program initiative to promote clinical standards and outcomes that build a culture of quality and safety within the organization.

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No relevant financial or intellectual conflicts to report.

Development Process

This clinical standard was developed using the process outlined in the EBOC Manual. The literature appraisal documents the following steps:

1. Review Preparation
 - PICO questions established
 - Evidence search confirmed with content experts
2. Review of Existing External Guidelines
 - Italian Society of Pediatric Infectious Diseases, Italian Society of Pediatric Otorhinolaryngology, and the Italian Society of Preventive and Social Pediatrics Management of Pediatric Cervical Lymphadenopathy (2015), American College of Radiology ACR Appropriateness Criteria: Neck Mass / Adenopathy (2012)
3. Literature Review of Relevant Evidence
 - Searched: PubMed, Google Scholar
4. Critically Analyze the Evidence
 - 9 nonrandomized studies
5. Summarize the Evidence
 - Materials used in the development of the clinical standard, literature appraisal, and any order sets are maintained in an infectious cervical lymphadenitis evidence-based review manual within EBOC.

Evaluating the Quality of the Evidence

Published clinical guidelines were evaluated for this review using the **AGREE II** criteria. The summary of these guidelines are included in the literature appraisal. AGREE II criteria evaluate Guideline Scope and Purpose, Stakeholder Involvement, Rigor of Development, Clarity and Presentation, Applicability, and Editorial

Independence using a 4-point Likert scale. The higher the score, the more comprehensive the guideline.

This clinical standard specifically summarizes the evidence *in support of* or *against* specific interventions and identifies where evidence is *lacking/inconclusive*. The following categories describe how research findings provide support for treatment interventions.

"Evidence Supports" provides evidence to support an intervention

"Evidence Against" provides evidence against an intervention.

"Evidence Lacking/Inconclusive" indicates there is insufficient evidence to support or refute an intervention and no conclusion can be drawn *from the evidence*.

The **GRADE** criteria were utilized to evaluate the body of evidence used to make practice recommendations. The table below defines how the quality of the evidence is rated and how a strong versus weak recommendation is established. The literature appraisal reflects the critical points of evidence.

Recommendation	
STRONG	Desirable effects clearly outweigh undesirable effects or vice versa
WEAK	Desirable effects closely balanced with undesirable effects
Quality	Type of Evidence
High	Consistent evidence from well-performed RCTs or exceptionally strong evidence from unbiased observational studies
Moderate	Evidence from RCTs with important limitations (e.g., inconsistent results, methodological flaws, indirect evidence, or imprecise results) or unusually strong evidence from unbiased observational studies
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Recommendations

Practice recommendations were directed by the existing evidence and consensus amongst the content experts. Patient and family preferences were included when possible. The Content Expert Team and EBOC team remain aware of the controversies in the diagnosis and management of infectious cervical lymphadenitis in children. When evidence is lacking, options in care are provided in the clinical standard and the accompanying order sets (if applicable).

Approval Process

Clinical standards are reviewed and approved by hospital committees as deemed appropriate for its intended use. Clinical standards are reviewed as necessary within EBOC at Texas Children's Hospital. Content Expert Teams are involved with every review and update.

Disclaimer

Practice recommendations are based upon the evidence available at the time the clinical standard was developed. Clinical standards (guidelines, summaries, or pathways) **do not** set out the standard of care and are not intended to be used to dictate a course of care. Each physician/practitioner must use his or her independent judgment in the management of any specific patient and is responsible, in consultation with the patient and/or the patient's family, to make the ultimate judgment regarding care.

Version History

Date	Comments
Apr 2018	Originally completed