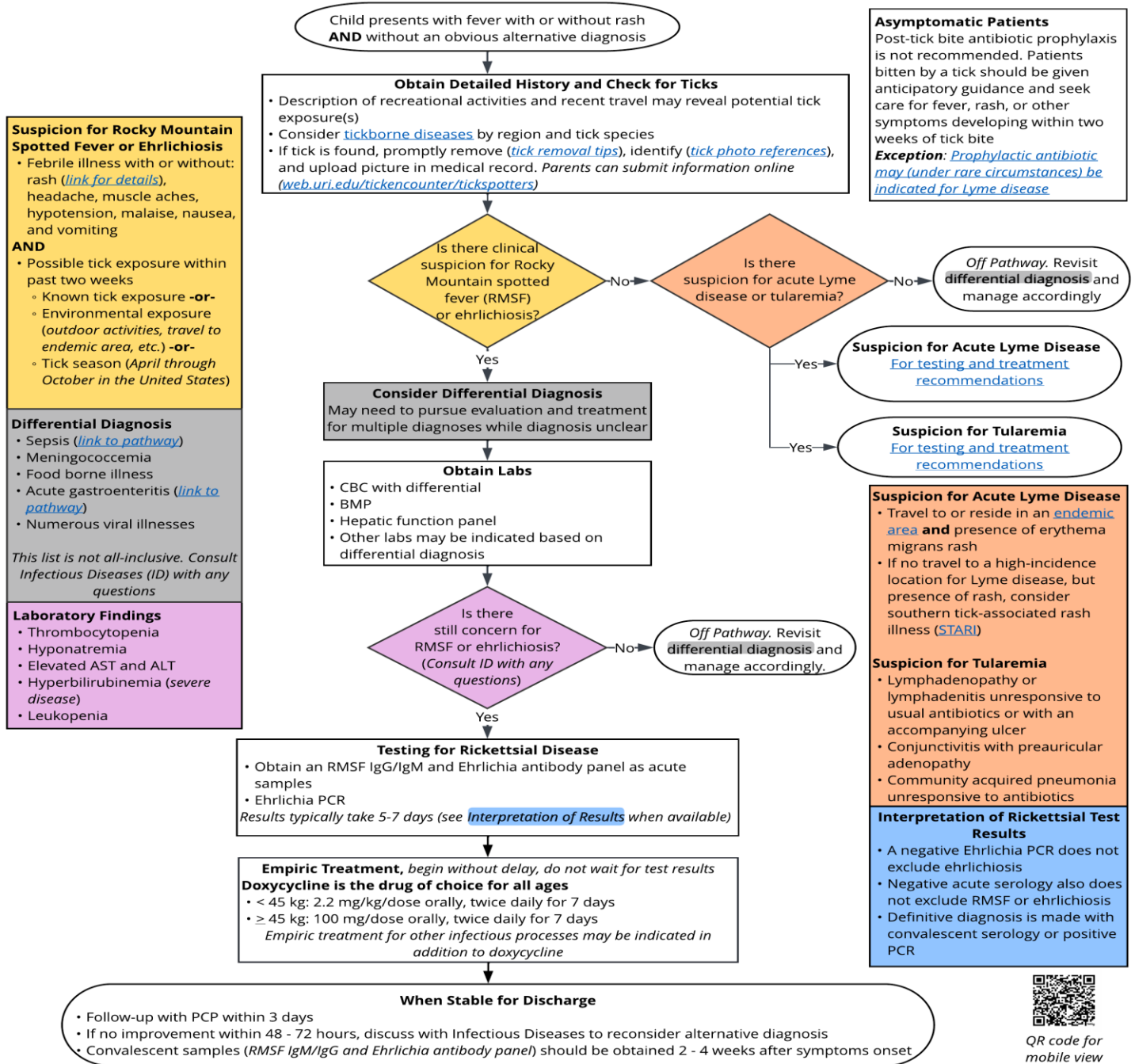


Tickborne Illness Clinical Pathway Synopsis

Tickborne Illness Algorithm



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Objective of Clinical Pathway

To provide care standards for the child presenting with fever with or without a rash and an apparent alternative diagnosis, rendering suspicion for tickborne illness. The Tickborne Illness Clinical Pathway guides the provider through testing and treatment recommendations when there is suspicion of Rocky Mountain spotted fever (RMSF), ehrlichiosis, Lyme disease or tularemia.

Background/Epidemiology

Vector-borne diseases, of which ticks are considered vectors, are a growing cause of concern in the United States due to the increase in reported cases and their potential for severe illness and a fatal outcome (Centers for Disease Control and Prevention, 2022; Read, 2019). Therefore, awareness of the geographic distribution and seasonal activities of the vectors, tick species associated with each tickborne infection, and possible signs or symptoms is essential when considering laboratory testing and treatment (Centers for Disease Control and Prevention, 2022; Read, 2019).

In Kansas and Missouri, the most prevalent tickborne illnesses are Rocky Mountain spotted fever, ehrlichiosis, tularemia, and Lyme disease (CDC, 2022; Kansas Department of Health and Environment, 2024; Missouri Department of Health and Senior Services, 2024). According to the most recently published data, 105 cases of tickborne illness were reported in the Kansas City area, consisting of Jackson, Johnson, Clay, and Wyandotte Counties, between 2019 and 2022 (CDC, 2024). Recognizing the concern regarding tickborne illnesses in the Greater Kansas City area, the Tickborne Illness Clinical Pathway Committee aims to provide decision-making support and guidance when addressing the care needs of a child when a tickborne illness is suspected, specifically when to initiate treatment or watch and wait.

Target Users

- Physicians (Emergency Medicine, Urgent Care, Hospital Medicine, Primary Care, Infectious Diseases, Fellows, Resident Physicians)
- Advanced Practice Providers
- Nurses

Target Population

Inclusion Criteria

- Child presenting with a fever with or without a rash

Exclusion Criteria

- Child with an apparent diagnosis where tickborne illness is not suspected

AGREE II

Three national guidelines provided guidance to the Tickborne Illness Clinical Pathway Committee (Biggs et al., 2016; Lantos et al., 2020; Pace & O’Reilly, 2020). See Tables 1, 2, and 3 for AGREE II.

Table 1

AGREE II Summary for the Diagnosis and Management of Tickborne Rickettsial Disease: Rocky Mountain Spotted Fever and Other Spotted Fever Group Rickettsioses, Ehrlichiosis, and Anaplasmosis – United States: A Practical Guide for Health Care and Public Health Professionals (Biggs et al., 2016)

Domain	Percent Agreement	Percent Justification [^]
Scope and purpose	74%	The aim of the guideline, the clinical questions posed, and the target populations were identified.
Stakeholder involvement	56%	The guideline was developed by the appropriate stakeholders and represents the views of its intended users. However, it did not include the views of some of the stakeholders, such as the target population.

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Rigor of development	56%	The guideline developers did not explicitly provide how the evidence was gathered and synthesized, how the recommendations were formulated nor how the guidelines will be updated.
Clarity and presentation	76%	The guideline recommendations present different management options. The guideline recommendations are not easily found and are vague.
Applicability	35%	The guideline did not address implementation barriers and facilitators, utilization strategies, or resource costs associated with implementation.
Editorial independence	81%	The recommendations were not biased with competing interests.
Overall guideline assessment	63%	
See Practice Recommendations		

Note: Four EBP Scholars completed the AGREE II on this guideline.

^Percentage justification is an interpretation based on the Children’s Mercy EBP Department standards.

Table 2

AGREE II Summary for the Clinical Practice Guidelines by the Infectious Diseases Society of America (IDSA), American Academy of Neurology (AAN), and American College of Rheumatology (ACR): 2020 Guidelines for the Prevention, Diagnosis and Treatment of Lyme Disease (Lantos et al., 2022)

Domain	Percent Agreement	Percent Justification [^]
Scope and purpose	93%	The aim of the guideline, the clinical questions posed and target populations were identified.
Stakeholder involvement	93%	The guideline was developed by the appropriate stakeholders and represents the views of its intended users.
Rigor of development	95%	The process used to gather and synthesize the evidence, the methods to formulate the recommendations and to update the guidelines were explicitly stated.
Clarity and presentation	96%	The guideline recommendations are clear, unambiguous, and easily identified; in addition, different management options are presented.
Applicability	63%	Barriers and facilitators to implementation, strategies to improve utilization and resource implications were addressed in the guideline.
Editorial independence	96%	The recommendations were not biased with competing interests
Overall guideline assessment	89%	
See Practice Recommendations		

Note: Four EBP Scholars completed the AGREE II on this guideline.

^Percentage justification is an interpretation based on the Children’s Mercy EBP Department standards.

Table 3

AGREE II Summary for the American Academy of Family Physicians (AAFP) Tickborne Diseases: Diagnosis and Management (Pace & O’Reilly, 2020)

Domain	Percent Agreement	Percent Justification [^]
Scope and purpose	51%	The aim of the guideline and target populations were identified. The clinical questions posed were not found in the guideline.

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Stakeholder involvement	21%	The guideline did not include appropriate stakeholders (such as physician representation for each discipline involved in the care or the target population) nor the viewpoints of the intended user.
Rigor of development	45%	The guideline developers did not provide how the evidence was gathered and synthesized, how the recommendations were formulated, or how the guidelines would be updated.
Clarity and presentation	94%	The guideline recommendations are clear, unambiguous, and easily identified; in addition, different management options are presented.
Applicability	28%	The guideline did not address implementation barriers and facilitators, utilization strategies, or resource costs associated with implementation.
Editorial independence	55%	It is unclear if the recommendations were biased by competing interests.
Overall guideline assessment	49%	
See Practice Recommendations		

Note: Four EBP Scholars completed the AGREE II on this guideline.

^Percentage justification is an interpretation based on the Children's Mercy EBP Department standards.

Practice Recommendations

Please refer to the three national guidelines (Biggs et al., 2016; Lantos et al., 2020; Pace & O'Reilly, 2020) for evaluating tickborne diseases, laboratory testing, and treatment recommendations.

Additional Questions Posed by the Clinical Pathway Committee

No additional clinical questions beyond those addressed in the national guidelines (Biggs et al., 2016; Lantos et al., 2020; Pace & O'Reilly, 2020) were posed for formal literature review.

Recommendation Specific for Children's Mercy

There were no deviations from the national guidelines regarding practice recommendations (Biggs et al., 2016; Lantos et al., 2020; Pace & O'Reilly, 2020), but logistical processes specific to Children's Mercy Kansas City were added.

- Guidance regarding laboratory testing for Rocky Mountain spotted fever, ehrlichiosis, Lyme, and tularemia diseases was provided
- Guidance regarding follow-up once the child has been determined to be stable for discharge

Measures

- Use of the Tickborne Illness Clinical Pathway

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 risk of missed diagnosis or undertreatment
- Decreased risk of overtreatment (i.e., prophylactic treatment for a tick bite when prophylaxis is not indicated)
- Decreased unwarranted variation in care

Organizational Barriers and Facilitators

Potential Barriers

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

Potential Facilitators

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- Collaborative engagement across care continuum settings during clinical pathway development
- Anticipated high rate of use of the clinical pathway

Power Plans

- The Tickborne Illness Clinical Pathway has no associated power plans. However, the clinical pathway guides the provider on individual orders needed for laboratory testing, treatment, and follow-up care

Associated Policies

- There are no associated policies relevant to the Tickborne Illness Clinical Pathway

Education Materials

- Tick Removal
 - Intended to guide parents and providers on the process for removing an attached tick
 - Linked through the Tickborne Illness Clinical Pathway algorithm

Clinical Pathway Preparation

This pathway was prepared by the Evidence Based Practice (EBP) Department in collaboration with the Tickborne Illness Clinical Pathway Committee, which is composed of content experts at Children's Mercy Kansas City. If a conflict of interest is identified, it will be disclosed next to the committee member's name.

Tickborne Illness Clinical Pathway Committee Members and Representation

- Chris Day, MD | Infectious Diseases | Committee Co-Chair
- Kedar Tilak, MD, FAAP | Pediatric Infectious Diseases/Neonatology-Fellow | Committee Co-Chair
- Katherine Randolph, DO | Pediatric Emergency Medicine-Fellow | Committee Member
- John Graham, MD | Pediatric Emergency Medicine | Committee Member
- Mogan Vaughn, MD, FAAP | Urgent Care | Committee Member
- Siân Best, MD | Hospital Medicine-Fellow | Committee Member
- Christine Scoby, DO | Hospital Medicine | Committee Member
- Danny Dooling, MD | Medicine-Pediatrics Resident | Committee Member
- Jill Vickers, MSN, RN, NI-BC, CPN | Clinical Practice and Quality | Committee Member
- Alaina Burns, Pharm.D., BCPPS | Clinical Pharmacy Specialist, Infectious Diseases | Contributor

EBP Committee Members

- Kathleen Berg, MD, FAAP | Hospitalist, Evidence Based Practice
- Kelli Ott, OTD, OTR/L | Evidence Based Practice

Clinical Pathway Development Funding

The development of this clinical pathway was underwritten by the following departments/divisions: Infectious Diseases, Pediatric Emergency Medicine, Urgent Care, Hospital Medicine, Clinical Practice and Quality, and Evidence Based Practice

Conflict of Interest

The contributors to the Tickborne Illness Clinical Pathway have no conflicts of interest to disclose related to the subject matter or materials discussed.

Approval Process

- This pathway was reviewed and approved by the Tickborne Illness Clinical Pathway Committee, Content Expert Departments/Divisions, and the EBP Department; after which they were approved by the Medical Executive Committee.
- Pathways 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.

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Review Requested

Department/Unit	Date Obtained
Infectious Diseases	January 2025
Pediatric Emergency Medicine	January 2025
Urgent Care	January 2025
Hospital Medicine	January 2025
Clinical Practice and Quality	December 2024
Clinical Pharmacy	December 2024
Evidence Based Practice	December 2024

Version History

Date	Comments
January 2025	Version one - <i>(developed Tickborne Illness Clinical Pathway and synopsis)</i>

Date for Next Review

- January 2028

Implementation & Follow-Up

- Once approved, the pathway 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.
- Education tools reviewed for health literacy.
- Education was provided to all stakeholders:
 - Divisions of Infectious Diseases
 - Pediatric Emergency Medicine
 - Urgent Care
 - Hospital Medicine
 - Clinical Pharmacy
 - Resident physicians
- Additional institution-wide announcements were made via email, the hospital website, and relevant huddles.

Disclaimer

When evidence is lacking or inconclusive, options in care are provided in the supporting documents and the power plan(s) that accompany the clinical pathway.

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