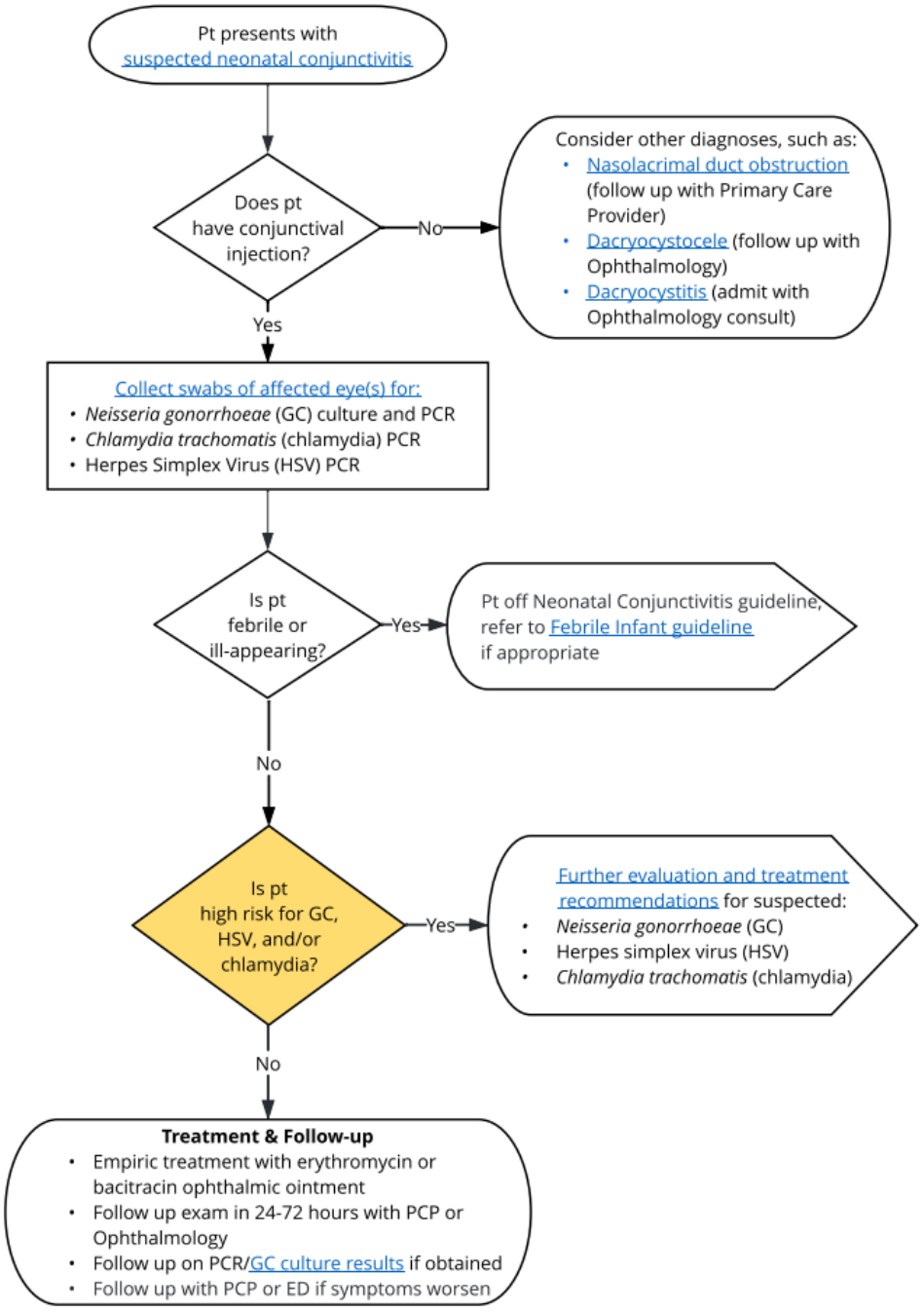
Neonatal Conjunctivitis
Clinical Pathway Synopsis

Neonatal Conjunctivitis Algorithm

Inclusion Criteria:
- Pt is ≤ 28 days
- Injected conjunctiva **and**
  - Mucopurulent discharge **or** hemorrhagic ocular discharge

Exclusion Criteria:
- Pt is febrile or ill-appearing (if appropriate refer to Febrile Infant guideline)
- Pt is ≥ 29 days of age



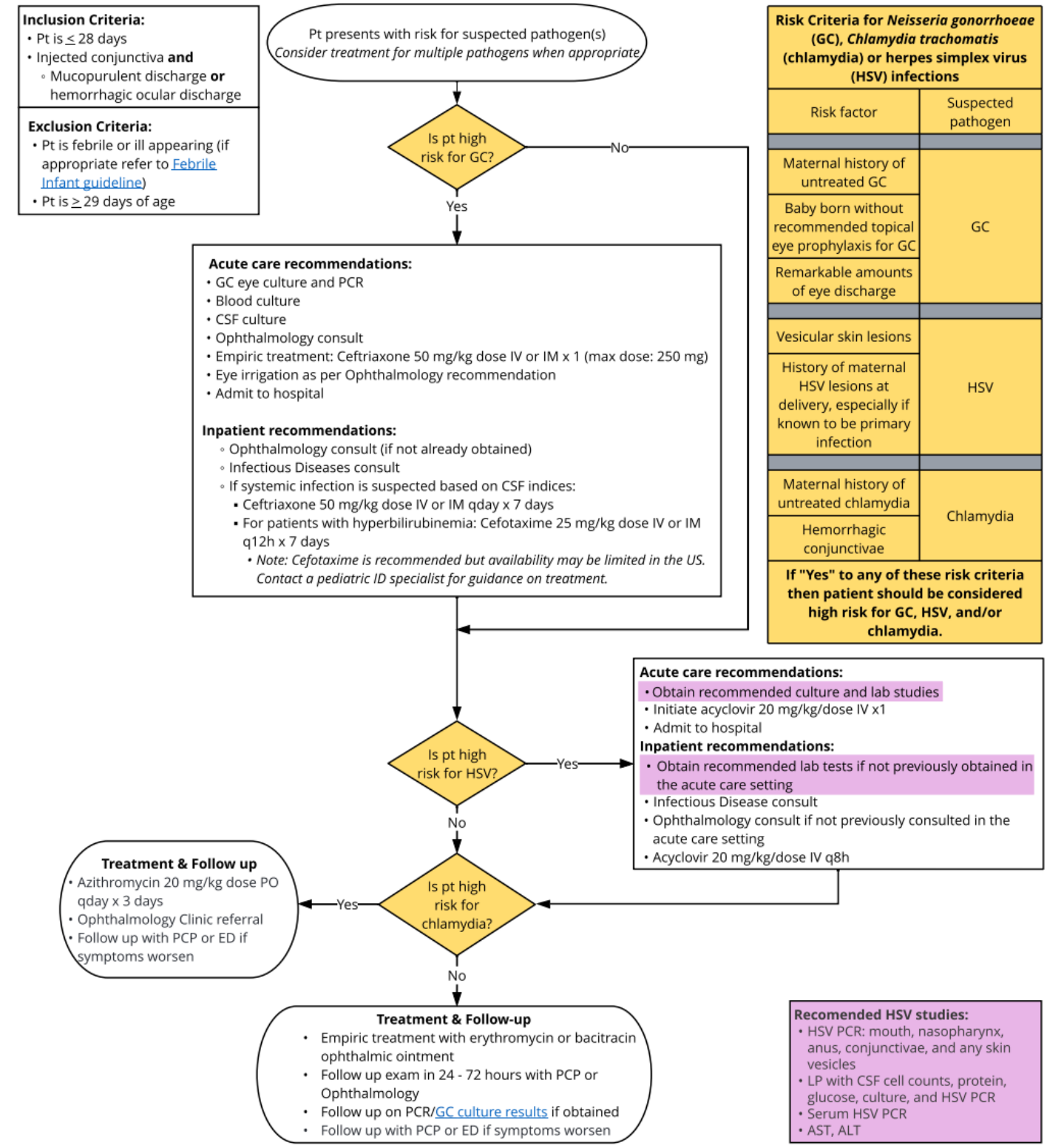
Risk Criteria for *Neisseria gonorrhoeae* (GC), *Chlamydia trachomatis* (chlamydia) or herpes simplex virus (HSV) infections

Risk factor	Suspected pathogen
Maternal history of untreated GC	GC
Baby born without recommended topical eye prophylaxis for GC	
Remarkable amounts of eye discharge	
Vesicular skin lesions	HSV
History of maternal HSV lesions at delivery, especially if known to be primary infection	
Maternal history of untreated chlamydia	Chlamydia
Hemorrhagic conjunctivae	

If "Yes" to any of these risk criteria then patient should be considered high risk for GC, HSV, and/or chlamydia.
Consider treatment for multiple pathogens when appropriate

** 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.*

Neonatal Conjunctivitis- Treatment 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.*

Table of Contents

** 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.*

Objective of Clinical Pathway

To provide care standards for the patient with suspected neonatal conjunctivitis. The aim of this clinical pathway is to standardize the diagnosis, treatment, and follow-up for these patients.

Epidemiology

Neonatal conjunctivitis occurs in up to 12% of newborns and result in complications, including corneal perforation with the potential for permanent blindness (Ochoa & Mendez, 2023). Prolonged eye closure and lack of tear production and drainage due to immature lacrimal ducts are associated with higher risk of conjunctivitis in neonates, particularly those that were born prematurely (Khan et al., 2022).

Pathogens that may result in serious infection include maternal sexually transmitted organisms: *Neisseria gonorrhoeae* (GC), *Chlamydia trachomatis* (chlamydia), and herpes simplex virus (HSV). Chlamydia is the leading cause of neonatal conjunctivitis and infectious blindness, attributing to 3% of global blindness (Khan et al., 2022). GC causes 0.4 cases of conjunctivitis per 100,000 live births in the US and can result in significant systemic infections such as meningitis and sepsis (Ochoa & Mendez, 2023). HSV conjunctivitis accounts for less than 1% of neonatal cases, and though the prevalence is low, HSV may also cause meningitis, encephalitis, or death (Ochoa & Mendez, 2023).

Conjunctivitis may also be caused by chemicals or other pathogens, including viruses, such as adenovirus and SARS-CoV-2, or other bacterial agents, such as *Staphylococcus aureus, Streptococcus pneumoniae*, *Haemophilus influenzae*, *Pseudomonas aeruginosa*, and various enteric organisms (Khan et al., 2022). This clinical pathway serves to standardize the evaluation, diagnosis, and treatment of neonates presenting with conjunctivitis.

Target Users

- Physicians (Emergency Department, Urgent Care, Hospital Medicine, Ambulatory, Fellows, Residents)
- Nurse Practitioners
- Nurses

Target Population

Inclusion Criteria

- Patients ≤ 28 days of age
- Patients presenting with injected conjunctiva in addition to mucopurulent discharge or hemorrhagic ocular discharge

Exclusion Criteria

- Patients ≥ 29 days of age
- Patients that are febrile or ill-appearing (refer to Febrile Infant guideline if appropriate)

Practice Recommendations

A clinical practice guideline has not been established for the care process for patients presenting with neonatal conjunctivitis. Practice recommendations are based on consensus among providers with knowledge of the existing evidence and expertise in the examination, diagnosis, and treatment of patients presenting with suspected neonatal conjunctivitis.

Additional Questions Posed by the Clinical Pathway Committee

No clinical questions were posed for formal literature review.

Recommendations Specific to Children's Mercy

- Examine the patient and order diagnostic testing based on the patient's clinical presentation
- Consider diagnoses outside of the guidance of the Neonatal Conjunctivitis Clinical Pathway
    - If the patient has ocular discharge without conjunctival injection, alternative diagnoses should be considered (e.g., nasolacrimal duct obstruction, dacryocystocele, dacryocystitis).
- Obtain eye swabs for GC culture and PCR, chlamydia PCR, and HSV PCR for all patients meeting inclusion criteria, regardless of risk factors.
- Provide appropriate empiric treatment based on the patient's assessed risk for infection with GC, chlamydia, or HSV.
    - Patients with risk factors for GC or HSV require additional work-up to rule out systemic disease and admission to the hospital for empiric antimicrobial therapy.

** 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.*

    - Patients without risk factors for GC or HSV, but with risk factors for chlamydia can usually be treated outpatient with a reliable follow-up plan.
- Instruct patient to follow-up with their primary care physician and/or ophthalmology as indicated.
- Follow-up on results of GC, chlamydia, and HSV testing, adjusting the treatment plan if indicated.

Measures
- Utilization of Neonatal Conjunctivitis Clinical Pathway and associated power plans
- Utilization of appropriate laboratory testing
- Utilization of appropriate treatment

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 under- or overdiagnosis
- Decreased risk of inappropriate treatment (i.e., unnecessary antibiotics or suboptimal antibiotics for infection type)
- Decreased inpatient length of stay
- 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
- Collaborative engagement across care continuum settings during clinical pathway development
- High rate of use of clinical pathway
- Standardized order set for Urgent Care Clinic, Emergency Department, and Hospital Medicine

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
- EDP: Eye Infection > Neonatal Conjunctivitis Subphase Pathway
- Inpatient: Neonatal Conjunctivitis Pathway

Associated Policies
- There are no existing policies associated with this clinical pathway.

Education Materials
- There are no existing educational materials associated with this clinical pathway.

Clinical Pathway Preparation

This product was prepared by the Evidence Based Practice (EBP) Department in collaboration with the Neonatal Conjunctivitis Clinical Pathway 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.

Neonatal Conjunctivitis Clinical Pathway Committee Members and Representation
- Adrienne DePorre, MD | Hospital Medicine | Committee Chair
- Chris Day, MD | Infectious Diseases | Committee Member
- Erin Scott, DO | Emergency Department | Committee Member
- Jennifer Qayum, OD, FAAO | Ophthalmology | Committee Member

** 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.*

- Alaina Burns, Pharm.D., BCPPS | Pharmacy | Committee Member

EBP Committee Members

- Kathleen Berg, MD, FAAP | Hospitalist, Evidence Based Practice
- Megan Gripka, MT (ASCP) SM | Evidence Based Practice

Clinical Pathway Development Funding

The development of this clinical pathway was underwritten by the following departments/divisions: Hospital Medicine, Infectious Diseases, Emergency Department, and Ophthalmology.

Conflict of Interest

The contributors to the Neonatal Conjunctivitis Clinical Pathway have no conflicts of interest to disclose related to the subject matter or materials discussed in this pathway.

Approval Process

- This product was reviewed and approved by the Neonatal Conjunctivitis Clinical Pathway 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
Hospital Medicine	July 2023
Infectious Diseases	July 2023
Emergency Medicine	July 2023
Ophthalmology	July 2023
Evidence Based Practice	July 2023

Version History

Date	Comments
June 2012	Version one
August 2018	Version two
April 2020	Version three
July 2023	Version four

Date for Next Review:

- July 2026

Implementation & Follow-Up

- Once approved, the clinical 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.
- Order sets/power plans consistent with recommendations were created or updated for each care setting
- Additional institution-wide announcements were made via email, hospital website, and relevant huddles.
- Metrics will be assessed and shared with appropriate care teams to determine if changes need to occur.

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.

These clinical pathways 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.

** 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.*

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

** 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.*

References

Khan, A., Anders, A., & Cardonell, M. (2022). Neonatal Conjunctivitis. NeoReviews, 23(9), e603-e612. https://doi.org/10.1542/neo.23-9-e603

Ochoa, K. J. C., & Mendez, M. D. (2022). Ophthalmia Neonatorum. In StatPearls [Internet]. StatPearls Publishing.

** 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.*