CLINICAL GUIDELINE FOR THE MANAGEMENT OF VIRAL LARYNGO-TRACHEOBRONCHITIS (CROUP)

V3.0
1. **Aim/Purpose of this Guideline**
   1.1. This guideline applies to all nursing and medical staff caring for an Infant/Child with Croup. It affects all infants, children and their families requiring management of Croup.

2. **The Guidance**
   2.1. Viral croup is the most common form of upper airway obstruction in children aged 6 months to 6 years.

   **Aetiology**
   
   Usually Para Influenza I, II or III
   Adenovirus
   Influenza A and B

   **Diagnosis**
   
   Viral prodrome 1 – 2 days
   Harsh barking cough
   Hoarse voice and stridor
   Fever < 38°

   **Differential Diagnosis**
   
   1. Epiglotitis
   2. Bacterial tracheitis
   3. Retropharyngeal abcess
      These patients (1-3) are usually more toxic with temperature > 38° and often drool.
   4. Foreign body

   (If these diagnoses are suspected early consultation with the consultant paediatrician on call, ENT and the on call anaesthetist should be undertaken).

   **Signs**
   
   - Tachypnoea
   - Tachycardia
   - Tracheal tug
   - Cyanosis on crying
   - Stridor worse on lying down
   - +/- confusion
   - +/- drowsiness
   - +/- sternum recession
Severity assessment

The severity of croup is often determined by the Westley croup score, the presence of chest wall retractions and stridor at rest are the two most critical clinical features.

Westley croup score

Each element is assigned a score, as illustrated below:

- Level of consciousness: Normal, including sleep = 0; disoriented = 5
- Cyanosis: None = 0; with agitation = 4; at rest = 5
- Stridor: None = 0; with agitation = 1; at rest = 2
- Air entry: Normal = 0; decreased = 1; markedly decreased = 2
- Retractions: None = 0; mild = 1; moderate = 2; severe = 3

The total score ranges from 0 to 17.

- Mild croup is defined by a Westley croup score of ≤2. Typically these children have a barking cough, hoarse cry, but no stridor at rest. Children with mild croup may have stridor when upset or crying (i.e., agitated) and either none, or only mild chest wall/subcostal retractions.

- Moderate croup is defined by a Westley croup score of 3 to 7. Children with moderate croup have stridor at rest, at least mild retractions, and may have other symptoms or signs of respiratory distress.

- Severe croup is defined by a Westley croup score of ≥8. Children with severe croup have significant stridor at rest, although stridor may decrease with worsening upper airway obstruction and decreased air entry. Retractions are severe (including drawing in of the sternum) and the child may appear anxious, agitated, or fatigued. Prompt recognition and treatment of children with severe croup are paramount.

Children who need immediate medical attention or further evaluation include those who have:

- Stridor at rest.
- An abnormal airway (e.g., subglottic narrowing from care in the neonatal intensive care unit).
- Previous episodes of moderate to severe croup.
- Medical conditions that predispose to respiratory failure (e.g., neuromuscular disorders).

- Rapid progression of symptoms (i.e., symptoms of upper airway obstruction after...
less than 12 hours of illness).
- Inability to tolerate oral fluids.
- Parental concern that cannot be relieved by reassurance.
- Prolonged symptoms (more than three to seven days) or an atypical course (perhaps indicating an alternative diagnosis).

Monitor

- RR
- HR
- SaO₂
- Hydration
- Level of consciousness
- Stridor
- Recession
- Air entry

Avoid doing anything that distresses the child
e.g. a. Inserting IV cannula
   b. Using tongue depressor

Investigation

- Minimise investigations.
- Lateral neck x-rays are not indicated as they are not a reliable indicator of disease severity.
- Avoid blood gases unless intubated.
- Chest x-ray is rarely required, but if indicated, use of a portable chest x-ray is recommended.

Management

General

1. Avoid doing anything that may distress the child -
   e.g. Inserting IV cannula
       Or using tongue depressor
       Or inserting NG Tube

2. Encourage good hydration

3. High humidity environments such as mist tents do not influence recovery rate

Steroids

Systemic dexamethasone and nebulised Budesonide are equally effective in reducing symptoms. Oral dexamethasone is less expensive and likely to distress the infant less so as the first line of treatment. Nebulised budesonide is the treatment of
choice in the vomiting infant. Oral prednisolone 1-2 mg/kg could be used if oral dexamethasone is not readily available.

Dexamethasone 150 micrograms/kg, then assess requirement for further 12 hourly doses either in hospital if still an in-patient or by GP if still has croup. Budesonide 2 mg nebulised stat if vomiting.

Intravenous dexamethasone 150 micrograms/kg can be used if the child with severe croup is vomiting and won’t tolerate nebulised budesonide. The insertion of a cannula may upset the child and be associated with an increase in the severity of the upper airways obstruction so this should be done with an anaesthetist present.

**Observation**

**Mild croup**

Children with mild croup who are tolerating fluids may be sent home after evaluation and a single dose of oral dexamethasone (randomized controlled trials have demonstrated that treatment with a single dose of oral dexamethasone may reduce the need for review, shorten the course, improve duration of the child's sleep, and reduce parental stress in children with mild croup). The caregiver needs to receive instructions regarding home care and indications to seek further medical attention including:

- Difficulty breathing
- Pallor or cyanosis
- Severe coughing spells
- Drooling or difficulty swallowing
- Fatigue
- Worsening course
- Fever (>38.5°C)
- Prolonged symptoms (longer than seven days)
- Stridor at rest
- Suprasternal retractions

**Moderate croup**

Children with moderate croup should be observed after pharmacologic intervention. During the observation period, children should be encouraged to drink. Children who received dexamethasone and remain symptomatic may need to be observed for at least four hours before deciding whether they require hospital admission or can go home (as the effect of dexamethasone may not be apparent for several hours).

**Indicator of Increasing Severity**

1. Increasing respiratory rate
2. Diminished air entry on auscultation
3. Cyanosis at rest with $\text{SaO}_2 < 93\%$ in air
4. Altered level of consciousness
5. Sternal recession
Indications for admission to HDU/ITU and Intubation under anaesthesia

1. Poor air entry
2. Cyanosis
3. Altered level of consciousness

Management

1. Call anaesthetist, Consultant Paediatrician and ENT Surgeon
2. Administer humidified Oxygen to keep SaO\textsubscript{2} > 93-95%
3. Deliver nebulised Adrenaline via face mask.

- 400mcg/kg (maximum dose 5mg) of 1 in 1000 Adrenaline (1mg/ml) diluted to 2-3 ml with NaCl 0.9% while closely monitoring ECG and SaO\textsubscript{2}, (discontinue if HR > 200 beats/minute). This will produce a transient improvement which normally lasts for about 2-3 hours so will buy time in order to organise an ITU/HDU bed. The dose of adrenaline can be repeated after 30 minutes if necessary.

<table>
<thead>
<tr>
<th>Clinical Signs</th>
<th>Assessment</th>
<th>Treatment</th>
</tr>
</thead>
</table>
| No stridor at rest, Mild chest retractions + SaO\textsubscript{2} > 93% | Mild | Oral Dexamethasone  
Send home |
| With Stridor at rest chest retractions and/or SaO\textsubscript{2} < 93% | Moderate | Observe for at least four hours  
Rx 1. Oral dexamethasone  
2. Oxygen if SaO\textsubscript{2} < 93%  
3. Ensure adequate oral hydration  
4. Discharge after four hours if fulfils the discharge criteria (see below), otherwise admit. |
| With Significant stridor at rest Severe retractions Reduced air entry + SaO\textsubscript{2} < 93% | Severe | Nebulised adrenaline  
Nebulised Budesonide  
Inform Paediatrician  
Admit to HDU and if no sustained improvement notify anaesthetist as may need intubation |
| With Confusion Drowsiness | Very Severe | Notify Anaesthetist, Paediatrician and ENT Surgeon  
Intubate  
IV Cannulation and Intravenous dexamethasone 150 micrograms/kg |
Criteria for Discharge

- No stridor at rest
- Normal pulse oximetry
- Good air entry
- Normal colour
- Normal level of conscious
- Demonstrated ability to tolerate fluids by mouth
- Caregivers understand the indications for return to care and would be able to return if necessary.

3. Monitoring compliance and effectiveness

<table>
<thead>
<tr>
<th>Element to be monitored</th>
<th>Compliance with guideline- first line drug treatment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>Audit Lead</td>
</tr>
<tr>
<td>Tool</td>
<td>Audit, Datix investigation</td>
</tr>
<tr>
<td>Frequency</td>
<td>At point of investigation or bi annually</td>
</tr>
<tr>
<td>Reporting arrangements</td>
<td>Audit lead, Audit and guidelines directorate meeting</td>
</tr>
<tr>
<td>Acting on recommendations and Lead(s)</td>
<td>Actions will be delegated at directorate meetings.</td>
</tr>
<tr>
<td>Change in practice and lessons to be shared</td>
<td>Required changes to practice will be identified and actioned. A lead member of the team will be identified to take each change forward where appropriate. Lessons will be shared with all the relevant stakeholders</td>
</tr>
</tbody>
</table>

4. Equality and Diversity

4.1. This document complies with the Royal Cornwall Hospitals NHS Trust service Equality and Diversity statement which can be found in the 'Equality, Diversity & Human Rights Policy' or the Equality and Diversity website.

4.2. Equality Impact Assessment

The Initial Equality Impact Assessment Screening Form is at Appendix 2.
Appendix 1. Governance Information

<table>
<thead>
<tr>
<th>Document Title</th>
<th>Clinical Guideline for the management of viral laryngo-tracheobronchitis. (Croup)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date Issued/Approved:</td>
<td>October 2017</td>
</tr>
<tr>
<td>Date Valid From:</td>
<td>October 2017</td>
</tr>
<tr>
<td>Date Valid To:</td>
<td>October 2020</td>
</tr>
</tbody>
</table>
| Directorate / Department responsible (author/owner): | Dr. Prendeville  
Child Health Consultant |
| Contact details: | 01872252017 |
| Brief summary of contents | Clear guidance for medical and nursing staff caring for a child presenting with Croup. |
| Suggested Keywords: | Children  
Croup  
Respiratory |
| Target Audience | RCHT PCH CFT KCCG |
| Executive Director responsible for Policy: | Medical Director |
| Date revised: | October 2017 |
| This document replaces (exact title of previous version): | Guideline for the management of Viral Laryngo-tracheobronchitis (Croup) |
| Approval route (names of committees)/consultation: | Paediatric Consultants  
Child Health Audit and Guidelines meeting |
| Divisional Manager confirming approval processes | David Smith |
| Name and Post Title of additional signatories | Not Required |
| Name and Signature of Divisional/Directorate Governance Lead confirming approval by specialty and divisional management meetings | {Original Copy Signed}  
Name: Caroline Amukusana |
| Signature of Executive Director giving approval | {Original Copy Signed} |
| Publication Location (refer to Policy on Policies – Approvals and | Internet & Intranet  
✓ Intranet Only |
Clinical Guidelines for the Management of viral laryngotracheobronchitis (Croup)

Related Documents:

All or part of this document can be released under the Freedom of Information Act 2000

This document is to be retained for 10 years from the date of expiry.
This document is only valid on the day of printing
Appendix 2. Initial Equality Impact Assessment Form

*This assessment will need to be completed in stages to allow for adequate consultation with the relevant groups.*

<table>
<thead>
<tr>
<th>Name of strategy / policy / proposal / service function to be assessed</th>
<th>Clinical guideline for the management of viral laryngo-tracheobronchitis (Croup)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Directorate and service area:</strong></td>
<td><strong>Is this a new or existing Policy?</strong></td>
</tr>
<tr>
<td>Child Health</td>
<td>Existing</td>
</tr>
<tr>
<td><strong>Name of individual completing assessment:</strong></td>
<td>Telephone:</td>
</tr>
<tr>
<td>T. Fergus</td>
<td>01872252800</td>
</tr>
</tbody>
</table>

1. **Policy Aim***

*Who is the strategy / policy / proposal / service function aimed at?*

To provide clear guidance for medical and nursing staff caring for a child with croup.

2. **Policy Objectives***

Clear guidance in management, observation, treatment and discharge.

3. **Policy – intended Outcomes***

Evidence based, standardised practice.

4. **How will you measure the outcome?***

Audit

5. **Who is intended to benefit from the policy?***

Children and families. Medical and nursing staff.

6a **Who did you consult with***

<table>
<thead>
<tr>
<th>Workforce</th>
<th>Patients</th>
<th>Local groups</th>
<th>External organisations</th>
<th>Other</th>
</tr>
</thead>
</table>

b). Please identify the groups who have been consulted about this procedure.

Please record specific names of groups

N/A

What was the outcome of the consultation?

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Clinical Guidelines for the Management of viral laryngo-tracheobronchitis Croup

Page 11 of 13
7. The Impact

Please complete the following table. If you are unsure/don’t know if there is a negative impact you need to repeat the consultation step.

<table>
<thead>
<tr>
<th>Equality Strands:</th>
<th>Yes</th>
<th>No</th>
<th>Unsure</th>
<th>Rationale for Assessment / Existing Evidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
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<tr>
<td>Sex (male, female, trans-gender / gender reassignment)</td>
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<td></td>
<td>X</td>
<td></td>
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<tr>
<td>Race / Ethnic communities /groups</td>
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<td></td>
<td>X</td>
<td></td>
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<tr>
<td>Disability - Learning disability, physical impairment, sensory impairment, mental health conditions and some long term health conditions.</td>
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<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Religion / other beliefs</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Marriage and Civil partnership</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Pregnancy and maternity</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
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<tr>
<td>Sexual Orientation, Bisexual, Gay, heterosexual, Lesbian</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

You will need to continue to a full Equality Impact Assessment if the following have been highlighted:

- You have ticked “Yes” in any column above and
- No consultation or evidence of there being consultation- this excludes any policies which have been identified as not requiring consultation. or
- Major this relates to service redesign or development

8. Please indicate if a full equality analysis is recommended. | Yes | No | X |
9. If you are **not** recommending a Full Impact assessment please explain why.

Not required
Keep one copy and send a copy to the Human Rights, Equality and Inclusion Lead
c/o Royal Cornwall Hospitals NHS Trust, Human Resources Department, Knowledge Spa,
Truro, Cornwall, TR1 3HD

This EIA will not be uploaded to the Trust website without the signature of the
Human Rights, Equality & Inclusion Lead.

A summary of the results will be published on the Trust’s web site.

Signed Chris Warren

Date 20/12/17