Emergency (ED) Acute Exacerbation of Asthma Adult Order Set

Evidence-based, severity-guided support for managing acute asthma in adults, with recommendations on aerosol delivery, pharmacologic therapy, oxygen use, non-invasive support, and environmental impact.

PATIENT INFORMATION

Last Name (Legal)	**First Name (Legal)**	
Preferred Name Last First		**DOB (dd-mm-yyyy)**
PHN	**ULI Same as PHN**	**MRN**
Administrative Gender Male Female Non-binary Prefer not to disclose Unknown		

SEVERITY-BASED DECISION SUPPORT

Asthma Exacerbation Severity (≥18yo)

MILD	MODERATE	SEVERE
Signs and symptoms: ☐ Speech: Speaks in sentences ☐ RR: 20-24 ☐ HR: 100-110 ☐ BS: ↓ and/or wheezing + ☐ Retractions: Mild ☐ Dyspnea: Mild with walking, can lay down ☐ Agitation: Minimal **or** PEF or FEV1 > 80%	Signs and symptoms: ☐ Speech: Speaks in short sentences ☐ RR: 25-30 ☐ HR: 110-120 ☐ BS: ↓↓ and/or wheezing ++ ☐ Retractions: Moderate ☐ Dyspnea: Moderate prefers to sit ☐ Agitation: Moderate **or** PEF or FEV1 60 to 80%	Signs and symptoms: ☐ Speech: Speaks in single words ☐ RR: > 30 ☐ HR: > 120 ☐ BS: ↓↓↓ and/or wheezing +++ ☐ Retractions: Generalized ☐ Dyspnea: Severe, seated leaning forward ☐ Agitation: Present **or** PEF or FEV1 <60%

Severity:			
Assessed by *(print)*	Designation	Signature	Date/Time (dd/mm/yyyy hhmm)

MONITORING / LABS

☐	Continuous SpO_2	☐	CBC	☐	Extended Lytes – Ca, P, Mg
☐	Continuous HR	☐	Arterial Blood Gas	☐	Severity score assessment q__h
☐	Continuous BP (every 5-10 mins)	☐	Venous Blood Gas	☐	CXR (not generally recommended for Asthma)

ACUTE MANAGEMENT (first hour)

PHARMACOLOGIC THERAPY - Bronchodilators

MEDICATION DELIVERY OPTIONS

MILD	MODERATE and/or SEVERE *not requiring HFNO/NIV*	SEVERE *Requiring HFNO/ NIV*
☐ Salbutamol **pMDI** 100mcg/puff with spacer _____ Puffs x3 PRN Shortness of breath **Consider:** ☐ Ipratropium bromide **pMDI** 20mcg puffs x3 *- For patients unable to coordinate breaths or generate adequate inspiratory flow, VMN should be considered [3,4]* *- pMDI should be delivered with a spacer to*	☐ Salbutamol **pMDI** 100mcg/puff with spacer _____ Puffs q20 min x3 PRN Shortness of breath ☐ Ipratropium **pMDI** 20mcg/puff with spacer _____ Puffs x3 *- For patients unable to coordinate breaths or generate adequate inspiratory flow, VMN should be considered [3,4]* *- pMDI should be delivered with a spacer to increase deposition*	☐ Salbutamol **pMDI** 100mcg/puff with Spacer Puffs q20min x3 PRN Shortness of breath ☐ Ipratropium **pMDI** 20mcg /puff with spacer Puffs x3 *For patients on HFNO or NIV: [16]* *- not recommended to disrupt oxygen delivery to deliver aerosol treatment* *- concurrent aerosol treatment with mask/mouthpiece not recommended (in-line delivery recommended)* *- adding flow to the circuit via JN is not recommended due to changes to FIO2 and nuisance alarms*
☐ Salbutamol ____mg q20min x3 PRN via **VMN + Aerosol Reservoir** ☐ Ipratropium Bromide via **VMN + Aerosol Reservoir** 0.5 mg x3	☐ Salbutamol via **VMN + Aerosol Reservoir** _____mg q20min ×3 PRN Shortness of breath ☐ Ipratropium Bromide via **VMN + Aerosol Reservoir** 0.5 mg x3 Shortness of breath	☐ Salbutamol via **VMN in-line** via HFNO or NIV ___mg q20min x3 PRN Shortness of breath ☐ Ipratropium Bromide via **VMN in-line** via HFNO or NIV 0.5 mg x 1 Shortness of breath
☐ Salbutamol via **JN** _____mg q20min x3 PRN Shortness of breath ☐ Ipratropium Bromide via **JN** 0.5 mg Shortness of breath ×3 *JN may be inferior to VMN (clinical outcomes & deposition) and not superior to pMDI [4,8]* *JN is not preferred in patients with respiratory infections due to infection control risk, pMDI & VMN are suitable alternative [20]*	☐ Salbutamol via **JN** _____mg q20min x3 PRN Shortness of breath ☐ Ipratropium Bromide via **JN** 0.5 mg x 3 Shortness of breath *JN may be inferior to VMN (clinical outcomes & deposition) and not superior to pMDI [4,8]* *JN is not preferred in patients with respiratory infections due to infection control risk, pMDI & VMN are suitable alternative [20]*	☐ Salbutamol via **JN** _____mg q20min x3 PRN Shortness of breath ☐ Ipratropium Bromide via **JN** 0.5 mg x 3 Shortness of breath *For patients on HFNO or NIV: [16]* *- not recommended to disrupt oxygen delivery to deliver aerosol treatment* *- concurrent aerosol treatment with mask/mouthpiece not recommended (in-line delivery recommended)* *- adding flow to the circuit via JN is not recommended due to changes to FIO2 and nuisance alarms*

Infection Prevention

In patients with respiratory infections, it is preferred to use pMDI due to risk of secondary exposure. [33]

If nebulizer is needed due to patient inability to coordinate breaths, or lack of inspiratory flow, VMN with mouthpiece & filter or in-line with viral filter is preferred over JN to reduce the risk of secondary transmission. [33]

In patients receiving HFNO it is recommended to place a surgical mask over cannula to reduce the risk of transmission. [33]

Environmental Sustainability

VMN + Ultra: Enables continuous delivery in-line with HFNO/BiPAP; reusable; Less plastic waste than disposable jet nebulizers [6-10] [11,12]

pMDI + Spacer: Lower plastic waste and energy use vs disposable jet nebulizers; reusable spacers last months.

Ordering Prescriber *(print)*	Designation	Signature	Date/Time (dd/mm/yyyy hhmm)

REASSESSMENT / MAINTENANCE (post 1-hour)

Score:			
Assessed by *(print)*	Designation	Signature	Date/Time (dd/mm/yyyy hhmm)

Considerations

- Clinicians should assess patients at least hourly to guide ongoing symptom management.
- With improvement, increase salbutamol dosing interval progressively: q1h → q2h → maintenance regimen.
- Once control is achieved, resume home controller medications, ensuring the patient can coordinate breathing and device puff.

PHARMACOLOGIC THERAPY (Continuation) - Bronchodilators

(continued device selection should be based on clinical considerations from the acute table)

MEDICATION DELIVERY OPTIONS	MILD	MODERATE and/or SEVERE *not requiring HFNO/NIV*	SEVERE *Requiring HFNO/ NIV*
	SCHEDULED DOSES		
	☐ Salbutamol **pMDI** 100mcg/puff with spacer ___Puffs Q_____min/hr PRN Shortness of breath **Consider:** Ipratropium bromide **pMDI** 20mcg/puff____ puffs q6h	☐ Salbutamol **pMDI** 100mcg/puff with spacer ___Puffs Q_____min/hr PRN Shortness of breath ☐ Ipratropium **pMDI** 20mcg/puff with spacer _____Puffs q6h ☐	☐ Salbutamol **pMDI** 100mcg/puff with Spacer _____Puffs Q_____min/hr PRN Shortness of breath ☐ Ipratropium **pMDI** 20mcg/puff with spacer _Puffs q6h
	☐ Salbutamol _____mg Q_____min/hr PRN via **VMN + Aerosol Reservoir** **Consider:** ☐ Ipratropium Bromide 0.5 mg Q6h via **VMN + Aerosol Reservoir**	☐ Salbutamol via **VMN + Aerosol Reservoir** ___mg Q_____min/hr PRN Shortness of breath ☐ Ipratropium Bromide via **VMN + Aerosol Reservoir** 0.5 mg Shortness of breath q6h	☐ Salbutamol via **VMN in-line** via HFNO or NIV _____mg Q_____min/hr PRN shortness of breath x3 ☐ Ipratropium Bromide via **VMN in-line** via HFNO or NIV 0.5 mg Shortness of breath q6h
	☐ Salbutamol _____mg Q_____min/hr PRN X3 via **JN** **Consider:** ☐ Ipratropium Bromide 0.5 mg q6h via **JN**	☐ Salbutamol _____mg Q_____min/hr PRN X3 via **JN** ☐ Ipratropium Bromide 0.5mg q6h via **JN**	Salbutamol via **JN** _____mg q20min x3 PRN Shortness of breath Ipratropium Bromide via **JN** 0.5 mg x 3 Shortness of breath

Ordering Prescriber *(print)*	Designation	Signature	Date/Time (dd/mm/yyyy hhmm)

RESPIRATORY SUPPORT / SUPPLEMENTAL OXYGEN

☐ Target SpO_2 ≥ 94% (peds) / ≥ 92% (adult)

☐ Room Air
☐ Nasal Cannula _____L/min
☐ HFNC: _____L/min (Peds: 1.5–2 L/kg/min; Adults: 30–60 L/min)
- Inline Aerogen Ultra VMN for bronchodilator delivery

☐ NIV/BiPAP: IPAP _____/ EPAP _____
- Inline Aerogen Ultra VMN via T-piece or mask adapter

Considerations

- HFNO with Cannula (Moderate)
  - In-line with Fisher&Paykel Airvo2 or 3 in combination with the Airvo Neb humidifier adaptor
  - In-line with the Vapotherm HVT 2.0 Aerosol Adapter
  - If High-flow Nasal Oxygen is being delivered via standalone humidification Aerogen should be on the Dry side of the humidifier at the inlet
  - Higher delivery occurs when the patients inspiratory flow is matched to or greater than flow from the HFNO device (consider reducing the flow of the highflow device)
- Optimal Placement for NIV (Severe)
  - Single Limb Circuit: Between a non-vented mask and the patient side of the leak port (non-vented masks not recommended).
  - Dual Limb Circuit: Optimal position would 15cm back from the Wye at the inspiratory limb or between the Wye and the patient, and pre-humidifier
- Reassessment
  - Response to NIV should be monitored at least hourly
  - Follow institutional guidelines for need of escalation

DISPOSITION

☐ Consider discharge in patients fitting into the mild category: Peak flow > 80% predicted O2>95%, RR <20, no desaturation during walk test and able to use pMDIs at home.

☐ Admit to Ward

☐ Admit to ICU

DEFINITIONS

pMDI	Pressurized Metered Dose Inhaler
VMN	Aerogen Solo Vibrating Mesh Nebulizer
Ultra	Aerogen Ultra Aerosol Reservoir with aerosol mask or valved mouthpiece
HFNO	High-Flow Nasal Oxygen
NIV	Non-Invasive Ventilation
DECAF	Dyspnea, Eosinopenia, Consolidation on chest x-ray, Acidemia (pH<7.3), Atrial fibrillation
BiPAP	Bilevel Positive Airway Pressure
EPAP	Expiratory Positive Airway Pressure
FiO2	Fraction of inspired Oxygen

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