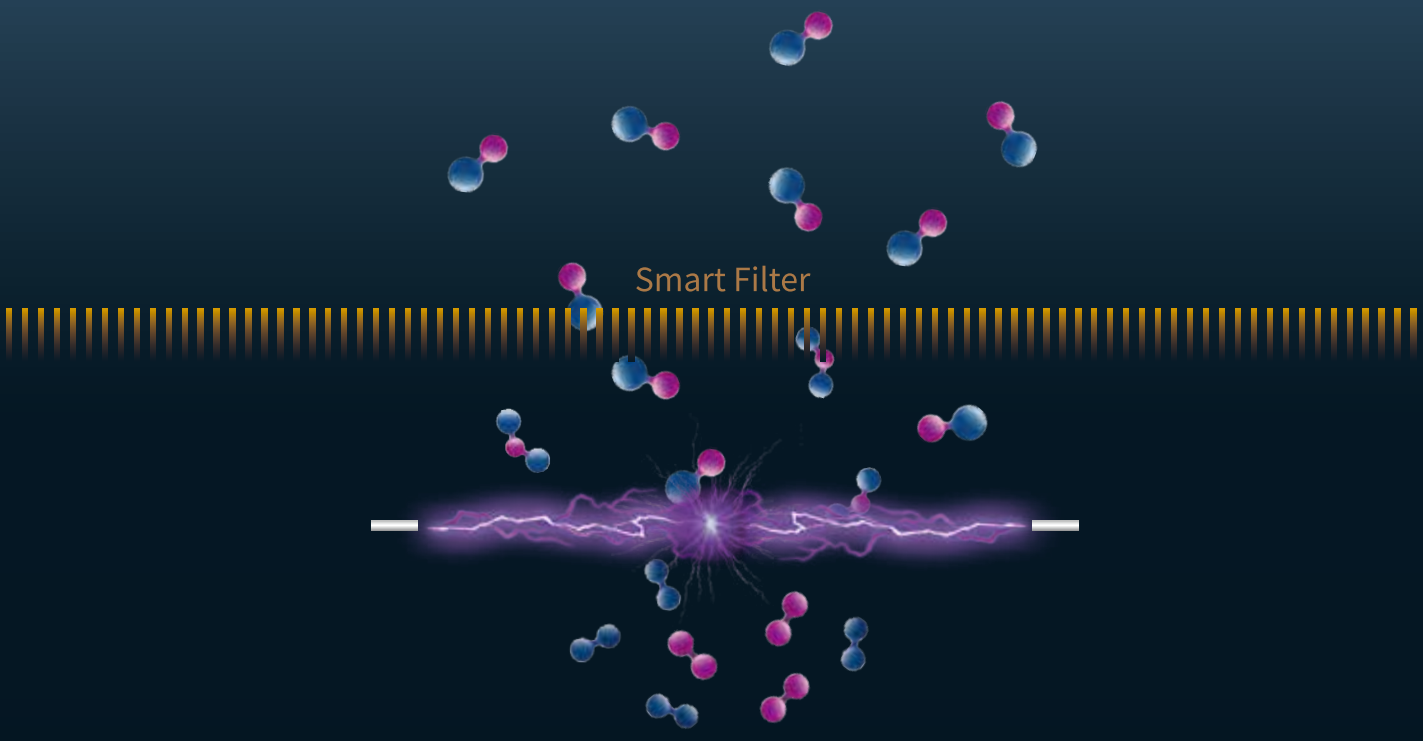
Novlead



eNOaire

Inspire miracles in the air

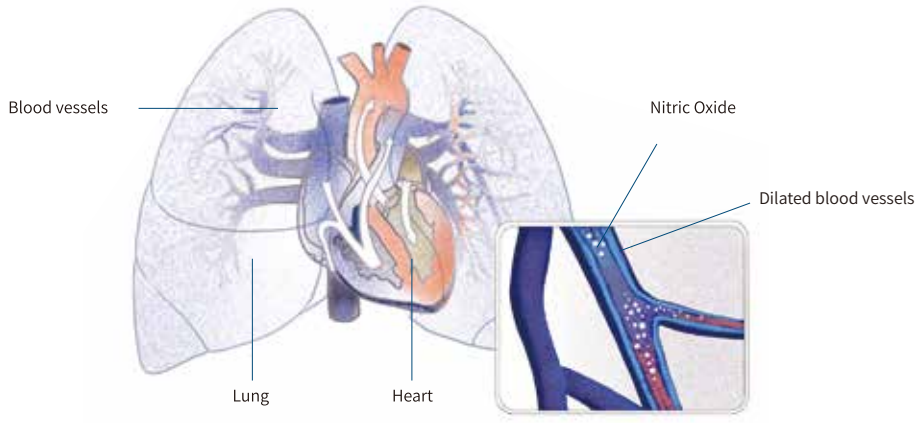


Smooth portable inhaled nitric oxide therapy

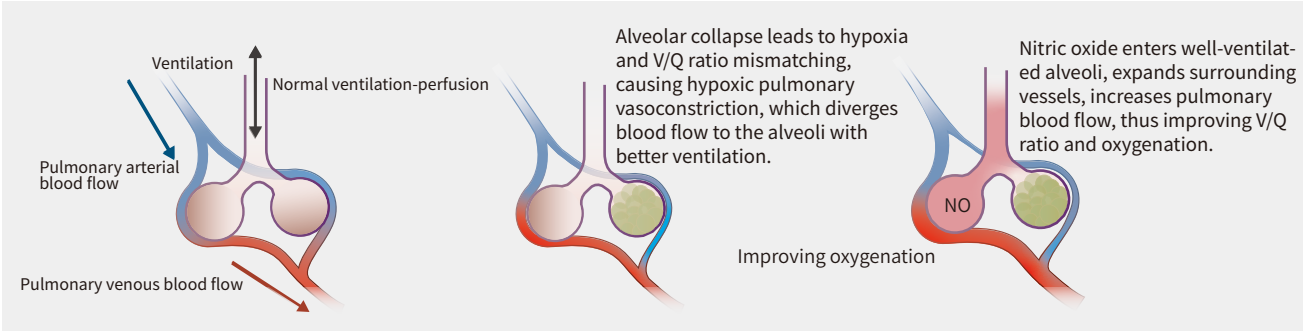
Instant filtration within reach

01 Physiology of Nitric Oxide

Nitric oxide (NO) has the capacity to selectively dilate pulmonary blood vessels, reduces pulmonary artery pressure without lowering systemic blood pressure (SBP), reduces the right ventricular afterload through pulmonary vasodilation. The vasodilation also increases pulmonary blood flow and combats V/Q mismatching, thus improving oxygenation.



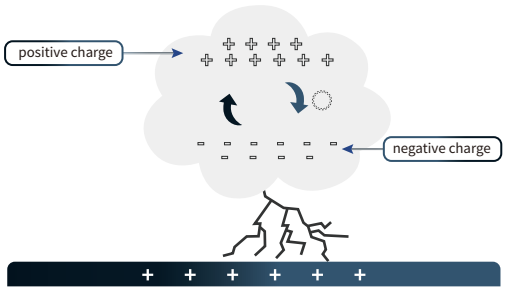
*Roberts JD, Polaner DM, Lang P, and Zapol WM. Inhaled Nitric Oxide in Persistent Pulmonary Hypertension of the Newborn. Lancet 1992; 130:435–40.

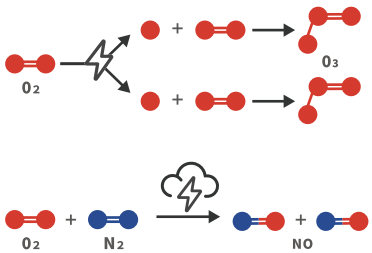


*Inhaled Nitric Oxide Therapy in Adults. N Engl J Med 2005; 353:2683-2695 DOI: 10.1056/NEJMra051884.

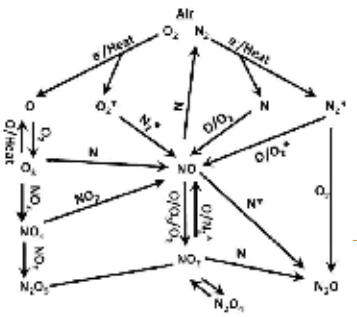
02 Plasma Discharge Based Nitric Oxide Generation

At certain enviroment, nitrogen (N_2) and oxygen (O_2) in spark plasma can decompose into single-atom free radicals (namely N and O), and generate nitric oxide through the Zeldovich reaction.





The composition of nitric oxide gas generated by plasma discharge is complex, containing some nitrogen oxide impurities such as NO_2, O_3, N_2O, as well as metal particles, which need to be filtered before being utilized as medical NO gas.

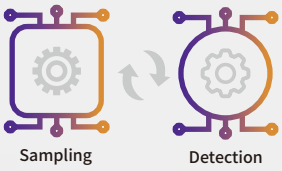


03 Advantages of eNOaire Inhaled Nitric Oxide Therapy Device



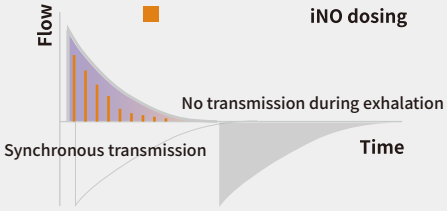
Dual System Design

O_2 injection and NO sampling are independent of each other; single factor faults do not affect the operation of other systems.

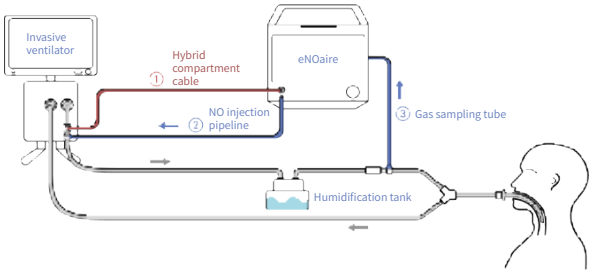


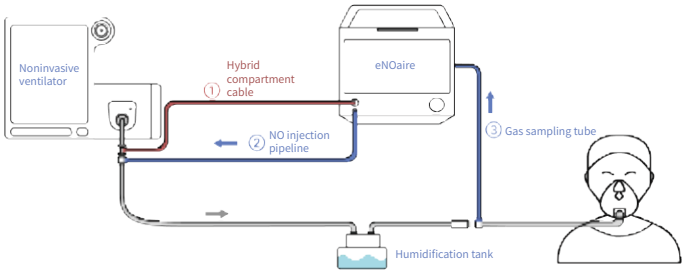
Synchronization with Ventilation

The input of NO and the output of NO delivered by the ventilator are synchronized to ensure the compatibility with patients' s breathing during treatment.



Concise Tube Connection Prompts





Diverse Interface Operation Functions

- Large font mode for easy monitoring
- Non-waveform monitoring to obtain flow information of ventilator at any time
- Screenshot available for future review
- Intelligent offline system to automatically reduce NO concentration during offline



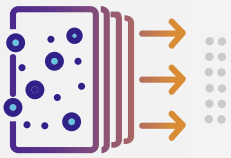
Patient-End Monitoring

The concentration of NO, NO_2 and O_2 near the patient's end (Y-tube) is monitored to ensure accurate inhalation of NO gas into the patient's body.

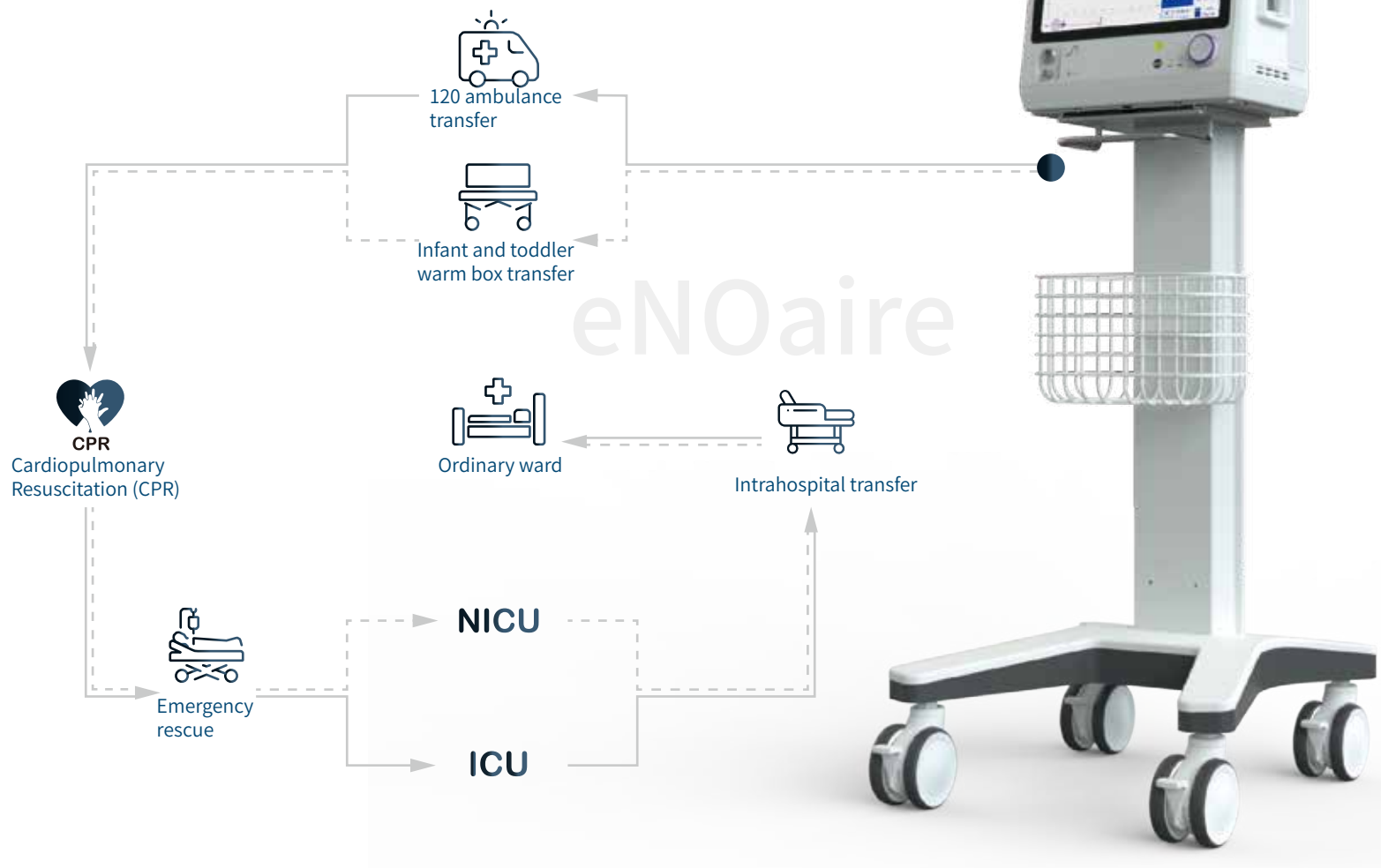


"Smart Filter" with High Efficiency

· **Four-layer filtration:** effectively filters various nitrogen oxide impurity gases and metal particles.
· **Quick switch design:** enables direct replacement of filter during treatment without the need for standby.
· **Easy to replace:** No special tools required; filter can be replaced with bare hands.
· **Asymmetric design:** Prevents misinsertion and reduces medical errors.



04 Application of eNOaire in Multi Scenarios



05 Clinical Indications



Persistent pulmonary hypertension in newborns (PPHN)

Newborns with hypoxic respiratory failure and PPHN, with an oxygenation index (oi) ⩾ 16, should consider NO inhalation therapy (maximum concentration of 20ppm), which can effectively reduce hypoxia, improve oxygenation, and significantly reduce the use of extracorporeal membrane oxygenation (ECMO).

Neonatal bronchopulmonary dysplasia

For premature infants at risk of BPD, NO inhalation therapy (with a maximum concentration of 20ppm) can significantly reduce the incidence and mortality of BPD, and there are no short-term adverse reactions.

Acute respiratory distress syndrome (ARDS)

Inhalation of NO (commonly used concentration 5-20ppm) can significantly improve oxygenation in ARDS patients and can be used as a treatment for refractory hypoxemia in moderate to severe ARDS patients.

Acute pulmonary heart disease

Inhaling NO can reduce pulmonary vascular resistance, increase right ventricular ejection fraction, reduce right ventricular dilation, and improve oxygenation.

Perioperative pulmonary hypertension of the heart

NO inhalation is a commonly used medication during cardiac surgery for patients with severe pulmonary hypertension and right heart dysfunction; Patients with concomitant pulmonary hypertension and right heart dysfunction have a good response to NO in the early stage after tricuspid valve repair or replacement surgery, reducing right heart afterload; Inhaling NO after heart transplantation can reduce the risk of right heart dysfunction and improve survival rate.

Viral pneumonia (Covid-19)

Inhaling NO not only improves short-term oxygenation in COVID-19 related hypoxemia patients, but high concentrations of N0 (80ppm) can also rapidly reduce viral load, with no toxicity and adverse event reporting.

Type-A aortic dissection

Inhalation of NO (5ppm) significantly improves Pa02/Fe02 in patients with severe hypoxemia after type-A aortic dissection surgery by reducing intrapulmonary shunt.

Pulmonary embolism; Amniotic fluid embolism

Inhaling NO as a supportive treatment for high-risk pulmonary embolism improves hemodynamics and oxygenation status by reducing pulmonary artery pressure and right heart afterload.
Early amniotic fluid embolism is often characterized by right heart failure, which can be reduced by inhaling NO (5-40ppm) to reduce right heart afterload.

Pregnancy complicated with pulmonary hypertension

Inhalated NO is not metabolized by the placenta, therefore there are no contraindications for use during pregnancy. Inhalation of NO (5-40ppm) as a selective pulmonary vasodilator is used to relieve pulmonary arterial hypertension during pregnancy.

Pulmonary hypertensive crisis

NO inhalation therapy should be used as the initial treatment for secondary pulmonary arterial hypertension crisis or acute right heart failure caused by increased pulmonary vascular resistance.

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Nitric Oxide Generation and Delivery System
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