



Advanced Critical Care Services



VMCLI
Veterinary Medical Center of Long Island
24 Hour Emergency & Specialty Services

Lead by ...

Dr. Nicole Spurlock, Diplomate ACVECC
VMCLI Internship Program Director



Dr. Spurlock graduated from Kansas State University's School of Veterinary Medicine in 2007 and went on to complete a one year small animal medicine & surgery internship at the Animal Medical Center in New York City. Following her internship, Dr. Spurlock's passion for emergency and critical care drove her to complete an additional three year residency in Emergency and Critical Care at the Animal Medical Center. Upon completion of her residency and the rigorous board certification process, she was accepted as a Diplomate of the American College of Veterinary Emergency and Critical Care in 2012. Dr. Spurlock joined us at the VMCLI that same year and brings a wealth of knowledge and expertise to our Emergency and Critical Care Departments.

Dr. Spurlock enjoys mentoring both interns and technical personnel and has assumed the lead of our extensive Internship Program. She is instrumental in educating and advancing the level of Critical Care Medicine, not only within our emergency service, but across all specialty services here at the VMCLI. Dr. Spurlock is dedicated to sharing her knowledge with our valued veterinary community. She enjoys lecturing on CPR, fluid balance, vasopressor therapy, environmental toxins, sepsis, emergency medical techniques, heatstroke and numerous other topics. She looks forward to presenting at our next CE event.

Dr. Spurlock recently authored an article published in the Journal of Veterinary Emergency and Critical Care regarding therapeutic use of human immunoglobulin in animals. Her experience spans many areas of veterinary medicine, with time spent in Africa working with wildlife, in Washington DC interning with the AVMA, and across the US volunteering with the Humane Society's outreach programs. Professional interests include pain management, hypotensive therapy, nutrition, post resuscitative care, and trauma. In her downtime, Dr. Spurlock enjoys dining, cheese, coffee, and travel. She resides in New York City with her large canine companion Frankie.

The VMCLI Offers Advanced Imaging, Treatment & Diagnostic Modalities

- 24 Hour Critical Care
- Arthroscopy
- Bronchoscopy
- Digital Radiography
- Endoscopy
- High Speed Spiral CT
- Low Light Laser Therapy
- Minimally Invasive Surgery
- MRI on Site
- Rehabilitation Therapy
- Telemetry
- Ultrasound



The VMCLI Critical Care Department provides initial stabilization and advanced life support of critically ill and injured patients. In addition to providing state of the art emergency care, the Critical Care Service works in conjunction with each specialty service at the VMCLI to provide peri-surgical and anesthetic support, as well as consultation for all hospitalized patients. Benefits include state-of-the-art continuous hemodynamic monitoring, blood pressure support, fluid therapy, transfusion medicine, and advanced pain management and relief. In addition to this, nutritional consultations and implementation of personalized nutritional plans will be available to support all critically ill patients to optimize their recovery.

Critical Care Services Available at the VMCLI:

- Consultation, diagnostic evaluation & treatment of critically ill or injured patients
- Pediatric and geriatric intensive care
- Advanced IV fluid and electrolyte therapy
- Mechanical ventilation & supportive care
- Telemetric monitoring of ECG, pulse oximetry, blood pressure & capnography
- Cross-matching & blood transfusion medicine
- Peritoneal and pleural dialysis for toxin removal or renal failure
- Total & partial parenteral (intravenous) nutrition for patients unable to eat
- Feeding tube placement for enteral nutrition
- Balanced analgesia for trauma patients

The Critical Care team happily accommodates emergency referrals during and after office hours. Alternatively, your patient can be admitted through the emergency service, 24 hours a day, 365 days a year for stabilization and transfer to any of our experienced & dedicated Specialty Services.

Our goal is to exceed your expectations!
For more information please call 631.587.0800

The Veterinary Medical Center of Long Island
75 Sunrise Highway West Islip, NY 11795
Tel: 631.587.0800 Fax : 631.587.2006

WWW.VMCLI.COM



Hypoxia occurs in a variety of critical illnesses and results in inadequate delivery of oxygen to the tissues. Hypoxia occurs secondary to low oxygen levels in the plasma (hypoxemic hypoxia), low hematocrit (anemic hypoxia), or hemoglobin dysfunction. Hypoxia can also result from the inability of cells to accept appropriately delivered oxygen (histotoxic hypoxia). Indications for oxygen therapy include a blood oxygen saturation (SaO₂) of less than 92%, partial oxygen pressure (PaO₂) of less than 70 mmHg on room air, cardiac instability, or hypoventilation. Oxygen supplementation is often thought of as a non-invasive, benign therapy; however, its use does carry the potential for adverse effects to the body.

Mucosal Damage

Appropriate flow rates are imperative for effective and safe oxygen delivery. Drying and dehydration of the nasal mucosa, respiratory epithelial degeneration, and impaired mucosal ciliary clearance increase the risk of infection in patients receiving supplemental oxygen. Humidification decreases the risk of mucosal damage exponentially.

Decreased Respiratory Drive

In healthy animals, hypercapnia is the primary stimulus for respiration. Because animals with chronic respiratory disease often live with elevated CO₂ levels, they are largely dependent on hypoxemia to stimulate respiration. The administration of oxygen to a chronically hypercapnic patient will depress the hypoxic respiratory drive precipitously, and can lead to hypoventilation and eventual respiratory failure. Caution should be used when providing oxygen therapy to patients with chronic respiratory disease.

Generation of Reactive Oxygen Species (ROS)

Although a small amount of ROS are produced through cellular respiration, a large amount of free radicals are created after any ischemic insult. With an overwhelming increase in reactive ions, systemic anti-oxidant defenses rapidly become depleted. Oxygen-derived free radicals subsequently cause direct damage to epithelial cells, and result in cell death.

Effects of membrane damage are seen in all organ systems, but are especially prominent in the brain, lungs, GI tract, and vascular endothelium. The CNS is especially sensitive to oxidative damage because of its high lipid content and low antioxidant levels. Excessive oxygen therapy can exacerbate primary brain injury and result in severe secondary damage, especially in cases of trauma. On a pulmonary level, oxidative destruction of the epithelial lung lining leads to airway inflammation, increased tissue permeability, pulmonary edema, and ultimately fibrosis. In the GI tract, ROS driven compromise predisposes to ulceration and bacterial translocation, increasing the risk of sepsis. Finally, vasoplegia can result secondary to capillary leak and microvascular sludging. This can lead to refractory hypotension in extreme cases.

Ischemic conditions carry additional risk for the development of oxygen's adverse effects, as their pathology involves an element of oxidative damage prior to oxygen therapy. Patients suffering from traumatic brain injury, post arrest syndrome, compartment syndrome, or prolonged hypotension often have a buildup of reactive intermediates which only need additional oxygen to incite a cascade of oxidative injury. In these cases, supplemental oxygen should only be provided if there is evidence of hypoxia.

The severity and time to develop oxidative injury are dependent on the fraction of oxygen provided (FiO₂) and duration of therapy. As a general guideline, FiO₂ of over 60% should not be administered for longer than 24-48 hours. Used judiciously, oxygen therapy is one of the most important tools available for critical patients, but it is not an innocuous therapy. It is imperative to be conscious of oxygen "as a drug" and use it accordingly.

For a complete [downloadable Quick Reference Chart on the Causes of Respiratory Compromise Resulting in Hypoxia](#), please visit us on the web at www.VMCLI.com and click on the **Continuing Education Tab**. If you should have any questions, please feel free to contact Dr. Nicole Spurlock at 631.587-0800 or at NSpurlock@vmcli.com.