involvement of the diaphragm (C3–5 segments), a larger portion of the accessory respiratory muscles, and autonomic dysfunctions that affect the respiratory system. Early recognition and timely management of autonomic dysfunctions in individuals with SCI are crucial for long-term health outcomes in this population. Numerous factors are responsible for respiratory dysfunction following SCI, including impairment of respiratory muscles, reduced vital capacity, ineffective cough, reduction in lung and chest wall compliance, and excess oxygen cost of breathing due to distortion of the respiratory system. Severely affected individuals may require assisted ventilation, which can cause problems with speech production. Appropriate candidates can sometimes be liberated from mechanical ventilation by phrenic-nerve pacing and pacing of the external intercostal muscles. Partial recovery of respiratory muscle performance could also occur spontaneously. This presentation will focus on available guidelines and the latest clinical evidence (Spinal Cord Injury Rehabilitation Evidence, SCIRE) on management of respiratory dysfunctions among individuals with SCI.


CO26-002–EN
Implanted phrenic nerve stimulation in quadriplegic patients with high cervical lesions
T. Simiowski
Service de pneumologie et réanimation médicale, assistance Publique-Hôpitaux de Paris, groupe hospitalier Pitié-Salpêtrière, 47-83, boulevard de l’Hôpital, 75651 Paris, France

Keywords: Quadriplegia; Central respiratory paralysis; Ventilatory dependency; Diaphragm; Stimulation

Implanted phrenic nerve stimulation restores ventilatory autonomy in patients with central respiratory paralysis, including those suffering from high cervical lesions and quadriplegia. Candidates must have preserved phrenic nerve conduction and a contractile diaphragm, which can be assessed through diagnostic phrenic nerve stimulation. There are currently two commercially available approaches for implanted phrenic stimulation, namely intrathoracic phrenic stimulation (quadripolar electrodes and radiofrequency transmission) and intra-diaphragmatic phrenic stimulation (hookwire electrodes and percutaneous wire transmission). Both techniques allow the patients to be weaned from mechanical ventilation, decrease respiratory infections, and bring a clear benefit in terms of quality of life (easier discharge home, increased mobility in the house and outside, improved safety feeling, restoration of the sense of smell). One of the available devices (intradiaphragmatic stimulation) obtained a reimbursement authorization in France in 2010, and the other (intrathoracic stimulation) will be inscribed in 2011. Implanted phrenic nerve stimulation is therefore a safe and effective technique for the management of quadriplegia-related ventilatory dependency. It is now fully and easily available in France, and should systematically be proposed to patients who are potential candidates.


CO26-003–EN
Managing high-level cervical spinal cord injuries: intensivist’s point of view
S. Pease
Réanimation chirurgicale polyvalente, hôpital Nicolas-Beaujon, assistance Publique–Hôpitaux de Paris, 100, boulevard du Général-Leclerc, 92110 Clichy-La-Garenne, France

Keywords: Spinal Cord Injuries; Ventilator Weaning; Trauma Centers/utilisations

Incidence of spinal cord injury in France is estimated at 1000 to 2000 patients per year. The diaphragm is innervated by the phrenic nerves that are formed from the cervical nerves C3, C4, C5. High tetraplegia is defined as a spinal cord injury for a level set from C1 to C4. More and more patients suffering such high level are now being admitted alive to trauma centres because of major progress made in pre-hospital management. Optimal pre-hospital management lies on direct admission to dedicated trauma centre, cautious cervical spine immobilization, and maintenance of adequate mean arterial blood pressure to improve spinal cord perfusion, mechanical ventilation in the case of respiratory insufficiency or coma. In hospital, time of surgery is decided as a collegiate decision between the neurological surgeons and the intensivist after managing first all life-threatening injuries. Weaning from mechanical ventilation must be envisaged as soon as possible after surgery, in the absence of any lung complication (infection, contusion). Ethical discussion are regularly held during ICU stay. Tracheotomy is frequently performed for comfort of weaning. Opportunity of implanting a phrenic-nerve pacemaker must be considered whenever possible. Weaning time goes from months to years. Early admission to spinal cord injury rehabilitation centres capable of managing ventilator weaning is therefore mandatory if aiming at early discharge from ICU.