**IL01**

**PREVENTION AND THERAPY OF PHANTOM LIMB PAIN**

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**Background.** The development of acute and chronic phantom pain following traumatic or elective limb amputation is still a major problem. Much progress has been made in the last years to understand the mechanisms underlying pain in amputees. The known mechanisms of both the peripheral and central nervous system are the basis of the prevention and therapy of phantom limb pain.

**Discussion.** Long lasting activity from primary afferents, peripheral and central sensitisation and cortical reorganization play a role in the development of phantom limb pain. The basis of preventive (preemptive) analgesia is therefore to prevent the development of phantom limb pain by regional and epidural analgesia. Local anaesthetics, opioids and NMDA-antagonists are effective to decrease or even inhibit synaptic transmission in the dorsal horn of the spinal cord. In the treatment of phantom limb pain medical treatment with opioids, tricyclic antidepressants, sodium channel blockers, local anaesthetics, calcitonin and ketamine, an NMDA-antagonist, are used. Additional treatment includes traumatic electrical nerve stimulation (TENS), acupuncture and surgical treatment but systematic clinical trails are rare. There is no treatment known up to date to desensitise established peripheral or central sensitisation.

**Conclusion.** Although clinical studies are rare and still controversial there is a neurophysiological rationale in the prevention and therapy of phantom limb pain. The basis lies in the prevention of peripheral and central sensitisation. Established phantom limb pain must be multimodally treated.

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**IL02**

**FLUID MANAGEMENT OF THE HEMODYNAMICALLY UNSTABLE PATIENT**

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Acute hypovolemia presents clinically in the form of tachycardia and/or hypotension and decreased central venous pressure (CVP). Measurement of CVP by means of a central venous catheter provides reliable information with regard to intravascular volume except in the presence of e.g. of pericardial tamponade or restriction, tricuspid valve dysfunction, or acute left ventricular (LV) failure due to myocardial ischemia. In many cases of LV dysfunction, therefore, enhanced intraoperative monitoring e.g. by transesophageal echocardiography (TEE) is required to support therapeutic decisions with regard to the fluid management and control the success.

Cardiac output, venous return, and the distribution of oxygenated blood flow to the tissues are balanced by neurohumoral and intrinsic cardiac factors. Preload, the contractile state, afterload, substrate availability, and the possible extent of myocardial damage determine myocardial performance and $O_2$ delivery. Cardiac reserve, oxyhemoglobin dissociation and the Frank-Starling mechanism also play an important role. As the Frank-Starling principle states that the degree of end-diastolic fibre stretch (preload represented by diastolic muscle length, end-diastolic pressure, end-diastolic volume) within a physiologic range is proportional to the systolic performance of the ensuing ventricular contraction (represented by systolic pressure, stroke volume, cardiac output, stroke work, cardiac work), monitoring of fluid administration should present these parameters.

Fluid therapy aims at providing maintenance requirements and replacing any deficits and ongoing losses. When renal function is normal, the kidney retains what is needed and excretes any excess. Blood loss and the degree of hemodilution should be closely monitored to tailor the amount and choice of fluid administration to the individual patient. With regard to volume, it is an advantage if cardiac load is monitored directly during the administration of fluids, especially if large amounts have to be given rapidly or if cardiac disease is present.

In summary, the need for direct monitoring of cardiac volume and function parameters in the hemodynamically unstable patients assigns TEE a crucial role in the decision making on fluid management.

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**IL03**

**BLOOD SAFETY STANDARDS IN THE ICU**

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Apart from bleeding complications diagnostic as well as interventional blood loss and especially blunted erythropoietin response contribute to the development of anaemia and - as a consequence - to increased transfusion requirements in ICU patients. Compared to survivors, patients who die in intensive care units have lower Hb-values and are transfused more frequently. A restrictive strategy of red cell transfusion (Hb 7-9g/dL) has been shown to be at least as effective as and possibly superior to a liberal transfusion strategy in critically ill patients especially in those with lower Apache scores and with younger age (1). There has also been no evidence that a liberal RBC transfusion strategy decreases the duration of mechanical ventilation. Only in a small group of anemic patients with COPD red cell transfusion has lead to a significant reduction of both the minute ventilation and the work of breathing. In these patients, transfusion may be associated with unloading of the respiratory muscles, but it may also result in mild hyperventilation (2). On the other hand in anaemic patients without lung disease, minute ventilation, work of breathing, and the capillary blood gas values did not change after increase of the Hb by a similar degree. In the subgroup of ICU patients with severe ischemic heart disease transfused patients had lower but nonsignificant absolute survival rates compared with the patients with Hb between 7 and 9g/dL.

In a recent retrospective evaluation in about 78.000 patients above 65 years with acute myocardial infarction blood transfusion was associated with a lower short-term mortality rate if the hct on admission was 30% or lower and was be effective in patients with a hct as high as 33% on admission. Nevertheless patients with lower hct values on admission had higher 30-day mortality rates (3).

Based on recent publications there is no evidence to transfuse above a Hb level of 7-9g/dL in non-symptomatic ICU-patients with the possible exception of patients with acute myocardial ischemia or with severe COPD.

**References**


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**IL04**

**MEDICAL INFORMATION FROM THE VIEWPOINT OF A HOSPITAL OWNER- A TURNING TO THE PATIENT OR A ‘LEGAL STUMBLING BLOCK’?**

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Steiermärkische Krankenanstalten Ges.m.b.H. Rechtsabteilung

Because of performance-based financing of hospitals, accompanied by reducing patients’ length of stay, providing patients with adequate medical information as a requirement to obtain his or her informed consent to medical treatment is frequently considered as a burden. To be valid, medical information has to be communicated in a personal, trustful