

**ANN MOLLER**

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15:00-15:45

Room Q

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## DRUGS

Substance abuse may be defined as self-administration of drugs which deviates from accepted medical or social use, which if sustained can lead to physical and psychological dependence[1].

The drug abusing patient presents for surgery with problems common to all drug abuse, and some specific to the individual drugs.

## PREOPERATIVE EVALUATION

### INTRAVENOUS ACCESS

If there is a suspicion of previous or ongoing intravenous drug abuse, one may expect difficulty in gaining intravenous access, due to previous thrombophlebitis. Assessment of intravenous access should be performed at the pre-anaesthetic clinic. The placement of a preoperative central venous line should be considered.

### NUTRITION

Drug abusers often have significant social problems and are prone to malnutrition. A body mass index (BMI) below 19 is associated with significant perioperative risk. Malnutrition may alter the effect of several anaesthetics, leading to haemodynamic instability and increased risk of postoperative complications, such as infections and impaired wound healing.

### IMMUNE SYSTEM

Intravenous drug users may suffer from the combination of an impaired immune system and exposure to different life threatening infections such as human immune deficiency virus, hepatitis and tuberculosis.

## COCAINE

Cocaine is highly addictive; casual use is not possible once addiction occurs, and life-threatening side effects accompany its use. Cocaine produces sympathetic nervous system stimulation by blocking presynaptic uptake of norepinephrine and dopamine, thereby increasing the postsynaptic concentrations of these neurotransmitters. Because of this blocking effect, dopamine remains in high concentrations in the synapses, producing the characteristic "cocaine high".

Cocaine can cause coronary vasospasm, myocardial ischaemia and myocardial infarction.

Systemic hypertension and tachycardia further increase the myocardial oxygen requirement at a time when the effects of cocaine decrease coronary oxygen delivery[2]. Patients who smoke cocaine have an increased risk of lung damage and pulmonary oedema. Chronic cocaine abuse is associated with nasal septal atrophy, agitated behaviour, paranoid thinking and heightened reflexes. Cocaine overdose results in sympathetic stimulation of the cardiovascular system, including coronary vasospasm, uncontrolled hypertension and platelet aggregation.

### ANAESTHESIA

When administering anaesthesia to cocaine abusers, it is important to be aware that these patients are vulnerable to myocardial ischaemia and cardiac dysrhythmias. Nitroglycerin should be available for treatment of myocardial ischaemia associated with systemic hypertension. Regional anaesthesia may be contraindicated by thrombocytopenia.

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## OPIOIDS

Opioids are highly addictive; addiction develops within a few weeks of abuse. The drugs can be abused orally, by inhalation, subcutaneously or intravenously to achieve euphoric and analgesic effects.

Medical problems associated with opioid abuse:

- Acquired immunodeficiency syndrome (AIDS)
- Hepatitis
- Skin abscesses
- Septic thrombophlebitis
- Tetanus
- Endocarditis with or without pulmonary emboli
- Aspiration pneumonitis
- Adrenal gland dysfunction
- Focal segmental glomerulosclerosis
- Malaria
- Malnutrition

### WITHDRAWAL SYNDROME

Withdrawal from opioids can complicate the perioperative period. Symptoms include manifestations of excess sympathetic nervous system activity (diaphoresis, mydriasis, hypertension, tachycardia), and craving for the drug followed by musculoskeletal discomfort, insomnia, abdominal cramps, and diarrhoea.

### ANAESTHESIA

Opioid addicts should have opioids maintained during the perioperative period. Due to the development of tolerance, opioid addicts must be expected to need more opioids than non-addicts. They also require increased amounts of other types of anaesthetics, such as volatile anaesthetics, barbiturates and propofol. A tendency to hypotension should be expected due to inadequate intravascular fluid homeostasis and impaired adrenocortical function. Opioid addicts appear to suffer from exaggerated postoperative pain. Large doses of short acting opioids are best avoided, and methadone (a long acting opioid) can be chosen or regional blockade considered[3].

## BARBITURATES

Barbiturates are highly addictive, but their abuse is not associated with major pathophysiological changes. Barbiturates are usually abused orally to counter insomnia, and their abuse is often associated with the abuse of other drugs. Tolerance for the effects develops rapidly, but the lethal dose does not increase at the same rate, thus heightening the risk of death with time.

### ANAESTHESIA

Barbiturate abusers develop tolerance for other anaesthetic drugs, so more anaesthetic agent is required. Chronic barbiturate abuse leads to induction of hepatic microsomal enzymes, speeding up the breakdown of drugs such as warfarin, digitalis, phenytoin and others.

## BENZODIAZEPINES

Addiction develops much more slowly than with barbiturates. Overdose is not likely to be fatal except if in combination with other drugs or alcohol.

### ANAESTHESIA

There are no specific anaesthesiological considerations. Hepatic microsomal enzymes may be slightly induced.

## AMPHETAMINES

Amphetamines stimulate the release of catecholamines, resulting in increased cortical alertness with associated appetite suppression and decreased need for sleep. Physiological dependence on amphetamines is profound. Chronic amphetamine abuse results in depletion of the body stores of catecholamines. The abuser may suffer from chronic hypertension, dysrhythmias and malnutrition.

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## **ANAESTHESIA**

Acutely intoxicated patients needing emergency surgery may suffer from hypertension, tachycardia, raised body temperature and an increased need for anaesthetic drugs. Body temperature may be poorly regulated, so this should be monitored during the perioperative period. In contrast, chronic amphetamine abusers may need markedly decreased amounts of anaesthetic, probably due to catecholamine depletion in the central nervous system. Hypotension should be corrected with directly acting vasopressors such as epinephrine.

## **HALLUCINOGENS**

Hallucinogens, such as lysergic acid diethylamine (LSD) and phencyclidine (PCP) are usually taken orally. Psychological dependence is usual, whereas physical dependence or withdrawal symptoms are unlikely. The effects of these drugs include visual, auditory and tactile hallucinations and distortion of surroundings and body image. Sympathetic nervous system stimulation is seen as mydriasis, increased body temperature, hypertension and tachycardia.

## **ANAESTHESIA**

LSD prolongs the analgesic and respiratory depressant effects of opioids. Exaggerated responses to sympathomimetics seem likely, so these drugs should be used with care.

## **ALCOHOL MISUSE**

Chronic alcohol abuse is associated with a wide range of medical conditions which have an important impact on the perioperative period. As alcoholism and alcohol abuse are very common in western countries this is of major importance for the anaesthesiologist.

### **MEDICAL PROBLEMS ASSOCIATED WITH ALCOHOL ABUSE:**

- Fatty change of liver / cirrhosis
- Hepatitis
- Oesophageal varices
- Wernicke's disease
- Cardiomyopathy
- Pancreatitis
- Polyneuropathy
- Malnutrition
- Smoking / COPD

### **WITHDRAWAL SYMPTOMS**

Alcohol withdrawal symptoms are common postoperatively. Symptoms range from mild to life-threatening and include: anxiety, irritability, depression, bad dreams, headache, sweating, nausea, vomiting, loss of appetite, insomnia, palpitations, clammy skin, tremor, hallucinations, agitation, fever and convulsions. Risk should be assessed and symptoms prevented by perioperative administration of benzodiazepines.

## **ANAESTHESIA**

It is important to find out about weekly alcohol consumption at the preoperative evaluation. Alcohol abuse may cause hepatic enzyme induction leading to enhanced metabolism of anaesthetic agents. Alcohol abusers often have haemodynamic instability during anaesthesia and it can be difficult to estimate their anaesthetic requirements. Surgical bleeding is often profuse and the patients are at risk of hypoglycaemia and hypothermia. They may emerge from anaesthesia in an agitated state. Apart from withdrawal symptoms, alcoholic patients suffer from an increased risk of postoperative complications, such as infections, cardiopulmonary complications and impaired wound healing. These postoperative complications can be significantly reduced by 4 weeks of alcohol abstinence before surgery[4].

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## TOBACCO

Smoking is related to a large number of medical problems. About one third of patients presenting for surgery are smokers.

### MEDICAL PROBLEMS ASSOCIATED WITH SMOKING

- Chronic obstructive pulmonary disease
- Emphysema
- Atherosclerosis
- Coronary artery disease
- Gastritis
- Gastric ulcers
- A wide range of smoking related cancers (lung, mouth and nose, bladder, renal, pancreas, cervix and thers).
- Miscarriage
- Foetal malformations
- Premature birth

### ANAESTHESIA

Smokers may have impaired pulmonary function and haemodynamic instability during anaesthesia. Induced microsomal enzymes increase the breakdown rate of anaesthetic agents. Smokers have a significantly increased risk of postoperative complications such as impaired wound healing, wound infection, anastomotic dehiscence, severe cardiopulmonary complications (requiring intensive care) and secondary surgery. Smoking intervention 6 to 8 weeks before surgery reduces the risk of pulmonary and infective complications, whereas wound healing improves after only 4 weeks of abstinence[5,6]. The effect of a shorter term of abstinence on perioperative complications is unknown

### REFERENCES

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3. Mitra S, Sinatra RS. Perioperative management of acute pain in the opioid-dependent patient. *Anesthesiology* 2004; 101(1):212-227.
4. Tonnesen H, Rosenberg J, Nielsen HJ, Rasmussen V, Hauge C, Pedersen IK et al. Effect of preoperative abstinence on poor postoperative outcome in alcohol misusers: randomised controlled trial. *BMJ* 1999; 318(7194):1311-1316.
5. Moller AM, Villebro N, Pedersen T, Tonnesen H. Effect of preoperative smoking intervention on postoperative complications: a randomised clinical trial. *Lancet* 2002; 359(9301):114-117.
6. Sorensen LT, Karlsmark T, Gottrup F. Abstinence from smoking reduces incisional wound infection: a randomized controlled trial. *Ann Surg* 2003; 238(1):1-5.