Surgical Smoke
In-Pendant Smoke Evacuation System
(IPSES)

Medical Products Pty Ltd

Dangers of Surgical Smoke

Components of Surgical Smoke: approx 5% Bio Aerosols / Cellular Debris & 95% Water

Surgical Smoke Bio Aerosols / Cellular Debris includes:		
Particles of Blood & Tissues	Viable Virus & Bacteria	Dangerous Chemicals inc Carcinogens

Mutagenic and Carcinogenic potential of Surgical Smoke compared with Cigarettes:

Laser Smoke: 1g excised tissue = 3 cigarettes
Diathermy Smoke: 1g excised tissue = 6 cigarettes

Viable Virus & Bacteria found to be present in Surgical Smoke include:
HIV, HPV (Human Papilloma Virus), Hepatitis B, S. Aureus, Tuberculosis, E. coli Spores

Toxic Gases & Chemicals Identified in Surgical Smoke (Including Carcinogenic Gases)		
Acetonitrile	Dodecane	Nonanal
Acetylene	Ethane	n-propylbenzene
Acroloin	Ethylene	Pentadecane
Acrylonitrile	Ethyl	Perchlorethylene
Alkyl benzene	Ethynyl benzene	Phenol
Amonia	Formaldehyde	Propene
Benzaldehyde	2-Furancarbox aldehyde	2-Propylene nitrile
Benzene	Heptanal	Pyridine
Benzonitrile	Hexadecanoic acid	Pyrrole (amine)
Butadiene	Hydrogen cyanide	Styrene
Butene	Indole (amine)	Tetradecane
3-Butenenitrile	Isobutene	Tetradecene
Carbon monoxide	Methane	Toluene (hydrocarbon)
Creosol	3-Methyl butenal (aldehyde)	Tridecane
Cyclohexane	6-Methyl indole (amine)	Undecane
Decane	4-Methyl phenol	1-Undecene (hydrocarbon)
1-Decene (hydrocarbon)	2-Methyl propanol (aldehyde)	Xylene
2,3-Dihydro indene (hydrocarbon)	Methyl pyrazine	

Health Risks of Surgical Smoke		
Allergic Reactions	Hypoxia/Dizziness	Nausea/vomiting
Anaemia	Irritation:	Respiratory Irritation:
Anxiety	- Eye	- Asthma
Carcinoma	- Sinus / Respiratory	- Chronic Bronchitis
Cardiovascular Dysfunction	- Throat	- Emphysema
Colic	Lacrimation	Sneezing
Dermatitis	Leukaemia	Weakness
Headache	Lightheadedness	

Other dangers of Surgical Smoke to Theatre Staff & Patients include:
Obstruction of Vision for Surgical Staff

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Surgical Smoke poses a significant danger to Staff and Patients in the Operating Theatre.

Because of the inherent risks governing bodies around the world are implementing standards to manage outcomes by removing smoke for the environment.

Generally the intent of these requirements is the management and removal of Surgical Smoke.

Australia:
Australian Council of O.R. Nurses (ACORN)
Australian Standard - AS 16571

North America
USA: NIOSH - Hazard Controls No. 11
Canada: CSA Z305.13-09 Plume Scavenging

Europe
Germany: TRGS 525, 8.1 SURGICAL PLUME
England: Control of Substances Hazardous to Health Regulations (COSHH - 2002)
Denmark: European directive concerning the min safety & health requirements for the workplace (89/654/EEC)

Solutions to the Dangers Posed by Surgical Smoke Exposure

A dedicated Smoke Evacuator is the most effective way to remove surgical smoke from the OR.

The **Cockatoo Blue In-Pendant Smoke Evacuation Systems (IPSES)** addresses a number of issues that exist with Portable Stand Alone Smoke Evacuators:

Silent:
Built into the pendant IPSES is effectively silent with the Motor/Turbine located in the Plant Room

Accessibility:
No excuses not to use smoke evacuation as the system is always present in the Theatre.

Powerful:
Motor/Turbine offers powerful flow of 1250 litres / minute

Safety:
In accordance with the Australian Standard the IPSES has a Stall Pressure of 100 mmHG. This ensures soft tissue cannot be damaged by occlusion of the suction tip.
Portable Systems generally do not have this safety feature.

Economy:
The IPSES generally offered much more cost effective filter option to Stand Alone systems with comparative running cost >50% less.

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Effective Smoke Evacuation:

The key to effective Smoke Evacuation is to place the filter box as close to the diathermy/laser machine and patient as possible.

Small diameter tubing has the greatest effect on flow and performance, the length of this tubing needs to be as short as possible.

The IPSES system has 2 models available:

1. CB 503 IP - where the diathermy machine is permanently attached to a pendant - IPSESE filter box to be installed on pendant
2. CB 502 - where the diathermy machine is on a trolley for more flexibility - IPSES filter box to be remotely attached to diathermy trolley with ducted hose

If you require further information or would like to have a meeting to discuss please feel free to call us at any time.

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