Comparison of four common heat and moisture exchangers used in the laryngectomized patient

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Laryngectomy results in a bypassed upper airway and places the burden of humidification on the lower airway. For this reason passive heat and moisture exchangers (HMEs) are used in the laryngectomized patient in an attempt to minimize the effect of lost upper airway function. The question however is: 'do these filters meet up with the desired efficiency?' To answer this question, we measured the moisture efficiency and airflow resistance of four common HMEs used in the laryngectomized patient.

The HMEs were measured according to a modified ISO 9360 standard. The airflow resistance was measured at flow rates of 15, 30 and 60 L/min. The measurements were repeated three times.

There were significant differences in moisture output and airflow resistance between the HMEs tested. The results were highly reproducible.

Filter material and size influence the HME's moisture output efficiency and airflow resistance. The differences run as high as approximately 20%. The construction differences, filter and housing type, have considerable influence on the daily HMEs costs. We believe that knowledge of the efficiency in combination with the average daily costs of the HMEs allows the clinician to make a balanced choice of which filter to use. None of the HMEs is as efficient as the nose.

Accelerated radiotherapy with carbogen breathing and nicotinamide in head and neck cancer

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Factors which adversely influence the radiation response of tumours are cellular repopulation and tumour hypoxia. Chronic hypoxia results from a low pO2 in tissues which can be increased by carbogen (95% O2 + 5% CO2) breathing. Acute hypoxia is caused by fluctuations in tumour blood perfusion and can be reduced by nicotinamide. Accelerated radiotherapy can counteract tumour repopulation. This is a study on a new strategy combining accelerated radiotherapy with carbogen and nicotinamide.

Patients with laryngeal (stage III–IV) and hypopharyngeal (stage II–IV) tumours and patients with unresectable tumours of the oral cavity and oropharynx received primary radiotherapy. Scuba-diving equipment was used for carbogen delivery. Nicotinamide was administered orally 1 h before irradiation. The overall treatment time was reduced by 8–10 days by giving two fractions per day during the last part of the treatment.

One hundred and four patients have been included. Mucosal reactions were increased but healing was complete in all patients. Frequent side-effects of nicotinamide are nausea and vomiting. One year actuarial locoregional control was 84% for patients with larynx and hypopharyngeal tumours and 37% for patients with far advanced oral cavity and oropharyngeal tumours.

This new treatment is feasible and the side-effects are acceptable. Preliminary tumour control rates are very encouraging.

Genetic susceptibility to head and neck squamous cell carcinoma. A multicenter case-control study

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In addition to the influences of exposure to carcinogenic compounds, the development of cancer may also depend on an individual intrinsic cancer susceptibility. Biomarkers for cancer susceptibility can be a powerful addition to epidemiological analyses. Mutagen sensitivity (mean number of chromatid breaks per cell of cultured lymphocytes treated with bleomycin in the late S-G2 phase of the cell cycle) was determined in 313 patients with head and neck cancer and 334 controls. There were no differences across the three institutions involved in the distribution of mutagen sensitivity for both subjects and controls. Values for patients were consistently and significantly (P < 0.0001) higher compared to values for controls in the overall analyses. Age, tobacco, or alcohol use, did not influence the outcome in terms of mutagen sensitivity values for either the patients or controls. A mean number of breaks per cell dichotomized at 1.0, was found to be the best predictor of a hypersensitive phenotype. For nonsensitive heavy smokers the odds ratio (OR) is 11.5. The OR