

EDP 01**PRIMARY CANCER PREVENTION: SCIENTIFIC PRINCIPLES**
R. Preussmann

Until recently the predominant activity in primary cancer prevention was directed at elimination or quantitative reduction of exposures to carcinogenic chemical risk factors. Remarkable success has been achieved in several areas, especially in prevention of tobacco-related and occupational cancers. Many regulatory measures are aimed at reducing exposure to carcinogens in the human environment such as in food, drinking water and ambient air. However, under environmental conditions, carcinogenesis in humans is not mono-, but multi-causal. The total human carcinogen burden is the sum of exposures to many carcinogens and determines cancer risk. Prevention can therefore only be stepwise: Elimination or reduction of exposure of single factors will reduce total exposure and, hence, total risk.

However, exposure prevention is not the only way of primary cancer prevention. The mechanism of chemical carcinogenesis by genotoxic carcinogens offers additional possibilities which should be further investigated in model experiments and epidemiological intervention studies: The action of so-called "anticarcinogens" could inhibit metabolic activation and/or favor detoxification reactions or might scavenge reactive ultimate carcinogens. The concept of anticarcinogenesis might be tried in the prevention of secondary tumors after cytostatic treatment of cancer patients with alkylating agents.

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EDP 02**CANCER RISK BY INHALATION OF TOXIC SUBSTANCES**
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The cancer risk caused by inhaled substances can be prevented only by reducing their concentrations in the ambient and indoor air. Thus, it is necessary to estimate the cancer risk caused by single substances as well as by mixtures, e.g. exhaust gases from incomplete combustion processes. Both epidemiological data and - increasingly - results from animal experiments are used for risk estimates; thereby the dose-response relationship is supposed to be linear in the low dose range and without a threshold. Until now the system of risk estimates has been insufficiently developed. Data are available mostly for asbestos and polycyclic aromatic hydrocarbons (PAH). Benzo(a)pyrene can be used as a suitable preliminary index for the carcinogenicity of the PAH. The PAH, however, may not be regarded as an index for the total carcinogenic potential for all polycyclic aromatic compounds and for different exhaust gases from incomplete combustion processes. Comparing emissions from coke ovens, Diesel motors, and cigarette smokers significant differences were found which can only be inadequately explained.

The aim of environmental hygiene is the detection, quantification, and prevention of cancer risks caused by individual life-style and by general pollutants. Furthermore, the existing emission standards for carcinogens in the "Technische Anleitung Luft" should be complemented by air quality guidelines or standards. These standards should reduce and limit the individual cancer risk caused by indoor and general ambient air pollutants. The maximal tolerable cancer risk has to be established politically.

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EDP 03**PREVENTION OF SMOKING AS THE MOST IMPORTANT PROPHYLAXIS OF CANCER**
F. Schmidt

Results of long-term cure in cancer are still unsatisfactory. This applies especially to smoker's cancers (bronchial carcinoma, laryngeal cancer and cancers of the entire upper airways, bladder and kidney cancer, pancreatic carcinoma, esophageal carcinoma etc.), so that about 40% of all cancers in men and about 30% of all cancers in both sexes taken together must be attributed to smoking. Smoking has thus become the most important individual and in principle most readily preventable cause of cancer.

All experts agree that medical efforts alone are not sufficient to reduce smoking. The battle against smoking requires vigorous countermeasures, above all on the political level, especially since in the meantime the damage to health caused by passive smoking can no longer be refuted with scientific arguments. The most important arguments are presented. Besides improved health education in schools, above all youth protection measures (prohibition of tobacco advertising in public, conversion of cigarette machines to cheque operation, the "smoke-free zone school", in which teachers also abstain from smoking in the school precincts, promotion of giving up smoking, statutory protection for nonsmokers also at the place of work etc.) are indispensable if our parliamentary representatives do not wish to be accused of a flagrant breach of their official duty.

However, doctors must also substantially intensify their efforts in this regard. The German Cancer Society must go ahead in this respect in the same way as the American Cancer Society for U.S.A. Research in the "ivory tower" of science is not enough: We must call for energetic measures against smoking on the political level by our government. All free-practicing doctors and hospital physicians must support our efforts to diminish the consumption of tobacco products of their patients with their full authority. Some proposals are made for this.

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EDP 04**PREVENTION OF EXPOSURE TO ENVIRONMENTAL CARCINOGENS**
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Exposure to environmental carcinogens is considered one of the major factors contributing to human cancer risk. Supportive evidence for this view has come from situations related to specific exposures such as occupational or tobacco-related cancers and their prevention. With respect to human environment, the situation is more complex, since many different carcinogens occurring in food, consumer items, water and air at low concentrations have to be taken into consideration. Prevention should be directed with priority to reduction of exposure to such environmental carcinogens known to be very potent and to occur at substantial concentrations in relevant environmental media. As an example, N-nitroso compounds have been found in foods, cosmetics and other consumer products, in pesticides and drugs, at specific working places and also are considered the most relevant carcinogens of tobacco. Moreover, they can be formed in the organism by endogenous reaction of amines with nitrite. Regulatory and deliberate measures have resulted in reduction of nitrosamine contamination in various environmental media. Endogenous formation can be reduced by decreasing nitrate levels in food, especially in vegetables and by intake of nitrite scavengers such as ascorbic acid. Selection of anticarcinogens to inhibit metabolic activation appears to be much more difficult since N-nitroso compounds can be activated by a variety of different enzymes.

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