

two instances, was actually decreased. Current risk assessment paradigms, by focusing on selected, isolated endpoints, can overestimate the actual total risk associated with PCB exposure. Therefore, a scientifically-based risk assessment should include evaluations for the overall incidence of tumors, in addition to counts at selected target organ sites.

1597 CENTRO DE INFORMACION TOXICOLOGICA: A RETROSPECTIVE STUDY OF NINE YEARS OF SERVICE.

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The Toxicological Information Center was founded in 1989 and is situated in the Department of Pharmacology and Toxicology of the Medicine School of the Universidad Autónoma de Nuevo León. It has 24-h information service 7 days a week given to the general public and health professionals. The present is a report of calls received by the center during 9 years of activities. Our center had 9320 telephone calls (1989-1997 period), of which 61% were real intoxications and 39% were calls regarding toxicologic information about antidotes, adverse drug effects or asking for analysis. Sixty two percent of the calls came from hospital physicians and practitioners, 20% from general public and 18% from industries. Children were involved in 53% of the cases, adults in 47%. The children were mainly preschoolers (71%). Among adults, women were slightly more represented than men. Among the products involved, medicinal drug were the most important group (30%), household products and cleaning agents were second in frequency (20) followed by pesticides (15). Accidental was the predominant situation (78%) and the main route of exposure was oral (89%).

1598 RISK COMMUNICATION REGARDING DIOXIN EXPOSURES TO INFANTS FROM MOTHER'S MILK: KEY UNCERTAINTIES RELATING TO STEADY STATE MODELING ASSUMPTIONS.

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Accumulation of polychlorinated dibenzo-p-dioxins and dibenzofurans (PCDDs and PCDFs) in the adipose tissues and mother's milk of humans is an important risk communication issue. In regulatory risk assessments the breast-fed infant dose model by Smith and colleagues is typically used to evaluate the incremental dose from a specific industrial source. This model infers that long term body burdens of 2,3,7,8-PCDDs and PCDFs accumulate according to an exponential function until "steady state" is reached, i.e., until the daily dose absorbed equals the daily dose excreted. The underlying logic of this model is probably not clear to most risk assessors or risk managers, yet is important both for accurate dose estimation and risk communication. Our presentation illustrates the following key aspects: 1) plausible maternal exposure time and rate are key because steady state for TCDD is not likely reached until after 25 or more years of continuous exposure; 2) modeling TEq can be misleading because each dioxin and furan congener has different pharmacokinetics; 3) to understand the potential for infant toxicity, the infant's body burden vs. time profile is most important; and 4) the use of multiple upper bound parameters can greatly overstate the plausible dose attributable to the source(s) at issue. Use of conceptually similar steady state modeling for source-related dioxin accumulation in human foodstuffs further magnifies the likely overestimation of the plausible infant dose. We recommend that these significant uncertainties be explained in all risk assessments attempting to estimate breast-fed infant exposures to PCDDs/PCDFs and other chemicals.

1599 URANIUM HEALTH ADVISORY.

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Uranium (U) is a naturally occurring element that makes up about 2% of the earth's crust. Uranium is naturally released into the air and water through weathering of rocks. The principal isotopes of concern in drinking water are U-234 and U238. In 1991, EPA proposed a Maximum Contaminant Level Goal (MCLG) for U of zero based on emission of alpha radiation known to be carcinogenic in humans. EPA based the Maximum Contaminant Level (MCL) of 20 µg/L based on kidney effects seen in a 30-day rabbit study by Maynard and Hodge (1949). The kidney effects have been identified as the

more sensitive end point of concern; the kidney effects are seen at very low levels of exposure to U. Also, carcinogenicity due to oral exposure to U has not been observed. The relative Source Contribution (RSC) used in the proposed MCL was 20%; EPA policy for water is to use a default factor of 20% RSC in the absence of specific data. Since the 1991 proposal, a new study has been published which has identified histopathological effects in rat kidneys (Gilman et al, 1998). In June of 1998, EPA sponsored a Uranium Issues Workshop (WS) to share research information and technical expertise on effects of U in drinking water. At the WS it was decided that the Gilman et al, 1998 study provided the most scientifically sound basis for risk assessment. Since the 1991 proposal, EPA has gathered data to show that the RSC from water is 77%. The details of the rat study and the procedure for deriving health-based levels and the new data to calculate the RSC will be presented. (The opinions expressed are those of the authors and do not reflect the Agency policy).

1600 IMPLICATIONS OF REGULATIONS IN THE CONTEXT OF CALIFORNIA'S PROPOSITION 65: IS IT REALLY NECESSARY TO LIMIT EXPOSURE TO BACKGROUND CONCENTRATIONS OF CHEMICALS?

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Under the Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65), Cal-EPA has developed a list of chemicals considered by the State to be carcinogens and/or reproductive/developmental toxicants. Cal-EPA has also established No Significant Risk Levels (NSRLs)-daily intakes that would result in one theoretical excess cancer in 100,000, for many of these chemicals. The NSRLs for N-nitrosodimethylamine (NDMA) and bis-diethylhexylphthalate (DEHP) are 0.04 and 80 µg/day, respectively. In this study, we analyzed some major contributors to background exposures to these chemicals, and found backgrounds to range between 5-100 times the NSRLs. The criteria for NDMA are stringent for a chemical that is rare as an environmental contaminant, yet common in our diet. Cancer risks from consumption of two meals of bacon a week from adolescence to age 70, or consumption of 3 bottles of beer or malt whiskey drinks a week (NDMA concentration of 2.5 ppb) for 40 years are approximately 1/10,000. The estimated daily dietary intake of NDMA (1 µg), may pose a cancer risk of approximately 1/1,000, and the total dietary dose of all nitrosamines is about 100 times the daily dose of NDMA. Further, lack of epidemiological data regarding excess cancers in humans associated with NDMA exposure suggests that it is unlikely that background exposures to NDMA, although significantly in excess of the NSRL, pose a genuine cancer risk. The DEHP NSRL is based on increased incidence of adenomas and carcinomas in the rat liver. Alternative analysis of the same animal data indicates the NSRL could be substantially higher, given the likely epigenetic mechanism of action, and still be health-protective. Given the stringent regulation of carcinogens by Cal-EPA, the risks from dietary and other background exposures are likely to be high relative to risks due to contaminated soil, water or other sources. We suggest that Cal-EPA and other regulatory agencies consider background concentrations while legislating and regulating chemicals. The recent EPA position on dioxin from incinerators using a Margin of Incremental Exposure Approach is a good starting point in this direction.

1601 RISK ASSESSMENT OF ATRAZINE, BENTAZON, DIBROMOCHLOROPROPANE, 1,2-DICHLOROPROPANE AND 1,3-DICHLOROPROPENE FOR DETERMINATION OF CALIFORNIA PUBLIC HEALTH GOALS IN WATER.

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Derivation of proposed California Public Health Goals (PHGs) for atrazine, bentazon, dibromochloropropane (DBCP), 1,2-dichloropropane (1,2-DCP) and 1,3-dichloropropane (1,3-DCP) is described. Risk assessments on each pesticide estimated the concentrations in drinking water that would pose no significant health risk to individuals consuming the water daily over a lifetime. Critical studies were selected, and exposure scenarios, relative source contribution, and body weight were considered. The proposed PHGs are based on mammary tumors in rats for atrazine (0.15 ppb), reduced body weight, hematological changes and intestinal disturbances in dogs for bentazon (200 ppb), squamous cell carcinoma of the forestomach in mice for DBCP (1.7 ppt), hepatocellular adenoma and carcinoma in mice for 1,2-DCP (0.5 ppb), and bladder transitional cell carcinoma in mice for 1,3-DCP (0.2