TOXICOLOGY REPORTER

Toxic Torts

PAPE & ASSOCIATES

Specializing in Toxicology

TOXIC TORTS: TOPICS

Carbon Monoxide

Lead Paint

Review of Lab Testing

Using the Internet

Case Consultation

Dr. Pape accepts some toxic tort cases that include questions regarding exposure - fate - effects - testing - results interpretation - or science-based opinion and consultation relating to the examination of experts.

Other Areas of Concentration

Alcohol – Drugs – Accident - Death

Liquor Liability

Evaluation of Toxicology Test Results

Over 50 Topic-related Newsletters

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Specializing in Toxicology

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Toxic Torts

Carbon Monoxide (CO):

Absorption-Distribution-Elimination of CO
CO is readily absorbed through the lungs; it binds with hemoglobin in red blood cells; it is distributed throughout the body in proportion to the blood volume and heme-containing proteins; and CO is largely eliminated post-exposure as a result of a relatively slow process involving exchange with oxygen. Blood carboxy-hemoglobin (CO-Hgb) concentration is usually expressed as a percent saturation (i.e. the % of hemoglobin combined with CO).

Mechanism of CO Toxicity
Toxicity associated with a decrease in the availability of oxygen at the cellular level is due to a reduction in the oxygen-carrying capacity of red blood cells as a result of the formation of carboxy-hemoglobin (CO-Hgb), a decrease in the dissociation of the available oxygen carried by RBCs (due to a shift in the oxygen dissociation curve), and the binding of CO to other heme-containing proteins including the cytochrome system responsible for cellular respiration.

CO + Hgb → CO-Hgb → Effects

Signs and Symptoms of CO Intoxication
Organs with the highest metabolic rates (oxygen requirements) are the most sensitive. For example, heart and brain tissue. Other factors that relate to target-organ toxicity include rate of respiration, metabolic requirements (exercise), and anemia. As a general rule, CO-Hgb level and effects are related to the level of inspired CO, the degree of physical activity, the duration of exposure, and pre-existing cardiovascular or cerebrovascular disease.

Following CO poisoning, potential neurological effects include change in mental status, coma, decerebrate rigidity, decreased comprehension-coordination-spatial reasoning-visual acuity, and short-term memory loss. Later complications include ARDS, myocardial damage, renal insufficiency, and neurological abnormalities. Longer-term neuropsychological sequelae of CO intoxication include deafness, blindness, impairment of memory, mental retardation, Parkinson-type syndrome, and/or personality change.

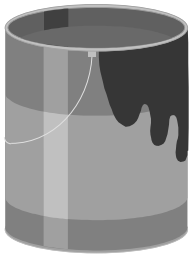
Diagnosis of CO Poisoning
The diagnosis of CO poisoning includes history, physical examination, clinical laboratory testing, response to treatment, and psychometric testing. *Ref.: Comp. Rev. in Toxicology, PD Bryson (1996).* Do not forget to establish the subject's history of tobacco use.

Lead Paint in a Home:

Expert review-consultation-report-and-testimony in a lead paint case usually includes the following:

Environmental surveys for lead

Evaluation of the methods used to test for lead or biochemical markers of lead exposure



Computerized biokinetic modeling of factors relating to the exposure-absorption-distribution-and-elimination of lead and comparison with measured blood lead levels

Construction and evaluation of time-lines and test results relating to locations (e.g. residences), sources of lead (i.e. potential exposures), blood lead (BPb) and erythrocyte protoporphyrin (EP) levels and BPb:EP ratios as indicators of the onset-duration-extent of exposure, medical treatments-effects, re-exposure to lead, the effects of lead, and confounding factors

Computer-based searches of the most current scientific literature, a *paper-chase* or search for expert publications or prior inconsistent statements, qualification of experts, trial exhibits, examination of experts, written report, and expert testimony

A review usually includes the following:

What were the sources, duration, and extent of the person's exposure(s) to lead?

Factors include residential time-lines, residential and environmental sources of lead and the associated lead levels, as well as time-specific events such as lead abatement(s).

What were the increases in the person's body burden of lead associated with these exposures?

Factors including the source-absorption-distribution-elimination of lead allow the computer-based biokinetic modeling of blood lead (BPb) levels.

What were the physiological, biochemical, and behavioral indicators that are consistent with lead? How sensitive and selective are these indicators for lead compared to other conditions?

In some cases, a toxicologist is asked to comment or report regarding the anticipated effects including neuropsychological effects; however, this would not ordinarily eliminate the need for a medical expert and/or a neuropsychologist.

Related *Toxicology Notes* include the relationship between increased body burdens of lead, post-chelation rebound of BPb levels, the interpretation of Pb-related test results.

Lead Paint Case Review: Special Topic

Corrected BPb and BPb:EP Ratio

BPb:EP ratio as a biological index to the duration of exposure to lead and/or re-exposure

Because blood lead (BPb) and erythrocyte protoporphyrin (EP) levels are affected by a variety of metabolic and physiological factors, it may be useful to evaluate these data in non-traditional ways:

Plot a graph of the specimen collection date versus BPb levels that have been corrected for hemoglobin (Hgb) concentration: Divide the BPb concentration by the Hgb concentration. For example:

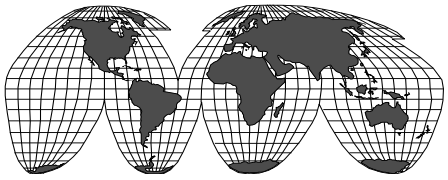
BPb/Hgb = 45 mg/dl / 15 gm/dl
= 3 mg Pb per gm of Hgb

Plot a graph of the specimen collection dates versus uncorrected EP or FEP levels or EP or FEP levels that have been corrected for the specimen's Hgb level;

Plot graphs of the specimen collection dates versus BPb or corrected BPb and EP or FEP levels; and,

Overlay these graphs with information including dates of residence, lead abatement, chelation treatments, and Pb-related graphs for siblings.

Information . . . Ideas . . . the Internet:



"Information leads to ideas . . . and advantage . . . there's the Internet . . . so . . . let's go find relevant and reliable information!"

Case example: The expert who was *NORMLized*

The pharmacologist's written report regarding the effects of marijuana seemed a little contrived but scientifically defensible … and he was very well qualified … and he was an experienced expert witness. His "problem" was found on the Internet:

An Internet search for the doctor's name found over 100 references. Yes … you're right … he was a member of the Board of Directors of NORML, the National Organization for the Reform of Marijuana Laws. He was clearly associated with the group's political, social, legislative, and scientific positions.

Case example: Dr. X - *Sauna Man*

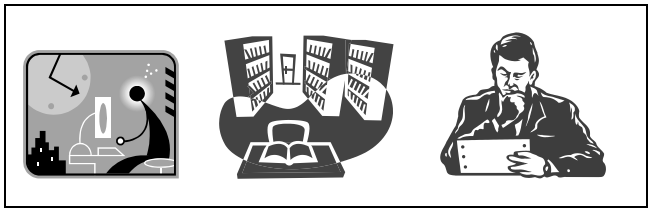
The plaintiff's case was relatively strong: She had been in excellent health; she had no history of allergy or immunologic deficiency; her acute chemical exposure due to a misapplication of a solvent-pesticide aerosol was well documented; and her acute-care medical records were consistent with chemical intoxication. The experts disagreed regarding her alleged residual immunologic deficiencies, multiple chemical sensitivities, treatment recommendations, and long-term prognosis.

Treatment became a big issue: The plaintiff's treating physician insisted on a *clean house*, a chemical-free diet, and heat treatments. Defense counsel geared-up for trial including the cross-examination of the plaintiff's expert, a "clinical ecologist". The defense expert searched the Internet. Based on the findings, defense counsel settled on a code-name for the expert: *Sauna Man*.

Sauna Man was chosen as a code name for the expert because of his prior medical opinions regarding clinical ecology and chemical detoxification including the use of heat treatments and water fasts. Unfortunately for the expert, his case-specific prescription of therapeutic saunas contributed to putting him in *hot water*.

Special services include literature review and related services as well as consultation relating to cross-examination of an expert

Literature Review and Related Services



Given the case-specific facts and legal issues, Dr. Pape will search-recover-review-and-summarize relevant scientific literature and illustrate the application of scientific studies to case analysis, the formulation-presentation-defense of case-specific opinions, and approaches to the cross-examination of an expert witness

Topic-specific Deposition

Science-based Pre-trial Motions

Voir Dire and Cross-examination

Exhibits for Mediation and Trial

Authoritative Publications

Cross-examination of an Expert

Throwing things rarely works!

If you're going to cross-examine the expert … **if you're going to *surgically* cross-examine the expert**, you had better review the case-records, study-up, talk with colleagues, go through some basic mental preparation; and you might want to strategize and then visualize your cross-examination.

Consider asking an expert to assist.

Consultation

The expert's typical assignment would be to provide for review, consultation, and comprehensive case-analysis focused on assisting an attorney preparing to cross-examine an expert.

The premise is that the effectiveness of your cross-examination is based in large part on your pre-trial preparation (i.e. your knowledge), your anticipation of the content of expert's testimony, the expert's usual or expected behavior when cross-examined, your confidence (i.e. a *have no fear* attitude based on knowledge-and-preparation), the effective use of techniques to control the expert, the coordinated use of case evidence and medical or scientific literature and related illustration, as well as a goal of providing the members of the jury with information and explanation .

Voir Dire

Consider making good use of a free voir dire rather than an expensive deposition. A voir dire allows for a careful review of the expert's file, orientation, foundation, and opinion out of the presence of the jury … and it allows you to gauge the expert's reaction to your use of control of the Q&A process. And, there is less opportunity for the expert to modify his/her opinions.

Carefully inspect the expert's file.
Establish what the expert did and did not do.
Review the expert's qualifications and experience.
Limit the scope/specificity of the expert's opinions.
Assess the expert's knowledge of relevant sciences.
Establish the expert's assumptions and question the foundation for those assumptions as well as the effects of different assumptions.
Reinforce your control over the Q&A process.

Cross-examination

Stick with your plan and build your credibility

An example skeletal outline of a *safe* approach to cross-examination follows:

Consider the voir dire
The expert's case file
The expert's activities
The expert's case-knowledge
The expert's reliance on case-assumptions
The expert's case opinions
Uncertainties associated with the case analysis
The relevant scientific literature
More reasonable explanations

Orient the jury to the elements of your cross-examination; build credibility with the jury; point to what may be an expert's *slanted* approach to case analysis-assumptions-and-opinions; use case-specific information and scientific literature; and control the expert.

Controlling the expert

When you cross-examine an expert, use different types of control techniques. For example:

Isn't it true that …?
Didn't [*witness*] testify that …?
Isn't it true you didn't …?
Are you able to …?
Please go to the board and …?
Are you familiar with …?
Why didn't you tell the members of the jury …?
Have you ever published anything in …?

Using scientific literature

You do not have to get the expert to agree that an article or book or study is generally regarded as authoritative in order to effectively use the information in that resource material.

Brian Pape, Ph.D.

Dr. Brian Pape specializes in toxicology and related sciences. His prior professional positions and responsibilities include Clinical Associate Professor of Pathology, University of Massachusetts School of Medicine; Senior Associate Consultant for Mayo Clinic and Director of Toxicology at New England Toxicology Services); and Director of Toxicology and Associate Professor of Pathology at the University of Missouri School of Medicine.

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