



Idiopathic Environmental Intolerance

Discussion paper prepared for

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This medical discussion paper will be useful to those seeking general information about the medical issue involved. It is intended to provide a broad and general overview of a medical topic that is frequently considered in Tribunal appeals.

Each medical discussion paper is written by a recognized expert in the field, who has been recommended by the Tribunal's medical counsellors. Each author is asked to present a balanced view of the current medical knowledge on the topic. Discussion papers are not peer reviewed. They are written to be understood by lay individuals.

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Discussion papers do not necessarily represent the views of the Tribunal. A vice-chair or panel may consider and rely on the medical information provided in the discussion paper, but the Tribunal is not bound by an opinion expressed in a discussion paper in any particular case. Every Tribunal decision must be based on the facts of the particular appeal. Tribunal adjudicators recognize that It is always open to the parties to an appeal to rely on or to distinguish a medical discussion paper, and to challenge it with alternative evidence: see *Kamara v. Ontario (Workplace Safety and Insurance Appeals Tribunal)* [2009] O.J. No. 2080 (Ont Div Court).

Version 2.0

IDIOPATHIC ENVIRONMENTAL INTOLERANCE

Idiopathic Environmental Intolerance is the preferred term¹ for what is otherwise known as Environmental illness or Multiple Chemical Sensitivity.

It is not a recognized disease² with demonstrable pathology, but a state of ill health characterized by a multiplicity of symptoms and attributed to environmental toxins. Symptoms vary but include headache, breathlessness, fatigue, impaired concentration and anxiety. Sufferers may be so disabled that they cannot work and they often attribute cause of the condition to the workplace. Symptoms however generally extend into the non-work environment and are complained of in a variety of settings.

No unique reproducible physical or biochemical abnormality has been demonstrated and the mechanism by which the symptoms are induced is still subject to debate. Indeed the very existence of the condition remains controversial and there is no universally accepted case definition. Nevertheless some insights have been gained from observational studies.

In the absence of demonstrable disease I.E.I. is attributed by sufferers to environmental exposure to many chemically unrelated substances in concentrations at which the majority of the population would be unaffected. The condition is thus distinguished from demonstrably toxic exposures to which the majority of the population would suffer injury or from demonstrable allergic reactions such as asthma. Despite the lack of objective findings the condition may cause major life disruptions. Environmental intolerance sufferers make an average of twenty-three healthcare visits per annum.³

The triggering substances may be identified or not, but are generally volatile chemicals. They may be single triggers but most often symptoms are evoked by multiple, chemically unrelated odors. In some, the complaints begin with an identified exposure but in at least 40% no such exposure is recalled. Women are disproportionately represented⁴ and there are substantial overlaps with chronic fatigue,⁵ fibromyalgia and other symptom-defined⁶ conditions. The true prevalence is unknown but estimates range from 0.2% to 4.0% of a general population. Experimentally the symptoms can be induced by lactate infusion⁷ or CO₂ inhalation⁸ in susceptible subjects and resemble panic disorder. These are characteristics of persons with chronic anxiety. Affected individuals are also characteristically liable to a variety of somatization even before I.E.I. is complained of.⁹

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Many theories have been advanced to explain the etiology of Idiopathic Environmental Intolerance (I.E.I.). One for which there is considerable evidence, is that I.E.I. is a manifestation of chronic anxiety. There is a tendency for sufferers to catastrophize and to adopt a particular attributional style. The contrary opinion is that the symptoms are due to an as yet undefined physiologic mechanism though to date no such mechanism has been reliably demonstrated. Postulated viral, immunologic and endocrinologic hypotheses abound. Thus these theories fall into two broad categories: physical/toxicologic and behavioural or psychologic.

Physical/toxicological theories that have implicated include (a) Immunologic, (b) Non-specific inflammatory and (c) Neurotoxic mechanisms. Well-controlled studies have failed to find evidence for immunologic abnormality¹⁰ and satisfactorily controlled studies of other mechanisms have not been performed. The relationship between the symptoms of I.E.I. and the claimed exposure does not fit the basic tenets of toxicity, i.e. dose dependency, reproducibility, consistency and predictability. Bradford Hills criteria for causality are notable for their absence.¹¹

Behavioural/psychological theories include behavioural conditioning¹² and attributional style, with risk perception being a major determinant.¹³ The concept of I.E.I. as a phobic disturbance is supported by studies of subjects with I.E.I. having been infused with sodium lactate¹⁴ and other substances¹⁵ then exhibit symptoms identical with panic disorder. This has led to the notion that I.E.I. is in effect "olfactory panic".¹⁶

Others have claimed that I.E.I. may be a misdiagnosed psychiatric illness.¹⁷ Certainly there is a body of evidence to suggest that a history of somatization and psychiatric morbidity was the strongest predictor of I.E.I., resulting from workplace exposure to chemicals.¹⁸

Finally there is speculation supported by the commonality of complaints between Chronic Fatigue, Fibromyalgia, Sick-Building and Gulf-War Syndromes that I.E.I. is simply the most contemporary cultural expression of psychosomatic illness.¹⁹

In conclusion, though no view of the etiology of I.E.I. is universally accepted the evidence for psychological/psychiatric/cognitive etiologies is increasingly more robust than the purely physical alternative. This step forward in acceptance has important implications for both prevention and treatment strategies as well as socio-political implication.²⁰

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It is an important concern for workplace compensation schemes as well as health care systems. As with the chronic fatigue syndrome, causal hypotheses will most probably be validated by successful treatment programs based upon them.

¹ ISRTP Board Conclusions. Reg. Toxicology. Pharmacology 18:79, 1993

² JOEM 41(11) 940-941, 1999

³ Bell IR, Schwartz GE, Baldwin CM et al. 1. Environmental. Health Perspect. 105 (Supple #2). 457-466. 1997

⁴ Bell IR et al. Am.J. Med. 105(3A), 745-825, 1998

⁵ Sparks PJ, Occupational. Med. 15(3), 497-510, 2000

⁶ Buchwald D & Garrity D.

⁷ Leznoff A, J Allergy & Clinical Immunology 99(4), 438-442, 1997

⁸ Poonai N et al, J. Allergy & Clinical. Immunology, 106(2), 358-363, 2000

⁹ Simon G, Katon WJ, Sparks PJ, Am. J. Psychiatry, 147 : 901-906, 1990

¹⁰ Simon G, Danell W, Stockbridge H. et al., Annals. Internal. Med. vol 119: 97-103, 1993

¹¹ Hill AB, Proc Roy Soc Med. 58: 295-300, 1965

¹² Bella-Wilson K, Wilson RJ, Bleeker ML.

¹³ McClelland GH, et al 1. Risk Analysis 10: 485-497, 1990

¹⁴ Binkley KE, Krutcher S.J. Allergy Clinical Immunology 99(4) 570-574, 1997

¹⁵ Leznoff A. J Allergy Clinical Immunology 99(4), 483-442, 1997

¹⁶ Binkley KE, Krutcher S.J. Allergy Clinical Immunology 99(4) 570-574, 1997

¹⁷ Black DW, Rhaths A, Goldstein RB., JAMA 264 : 3166-3170, 1990

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¹⁸ Simon G, Katon WJ, Sparks PJ., Am.J. Psychiatry 147, 901-906, 1990

¹⁹ Brodsky CM, Occupational Med. 2 : 695-704, 198

²⁰ Deyo RA, NEJM 336(16) : 1176-1179, 1997