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Addiction

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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 Discussion papers are not peer reviewed.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.

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).

ADDICTION

1. Introduction:

Addiction is defined as the adverse consequences associated with compulsive drug-seeking. In Canada, the economic toll associated with drug and alcohol addiction, and co-morbid mental illnesses, is estimated to be $40-52 billion dollars [1, 2], and in the US such estimates are approximately $559 billion per year [3]. At the same time, addiction assessment and treatment services are greatly lacking in Canada, with specialized treatment services often available only in urban centers, and with demand greatly exceeding treatment capacity. In fact, only about 10-12% of people with addictions actually seek treatment [4], so this lack of treatment capacity is a considerable challenge for successful addiction treatment, and recovery. Fortunately, there is increasing appreciation of alcohol and drug addictions as chronic medical illnesses, worthy of medical treatment and insurance and disability coverage [5]. To this end, alcohol and drug addictions are classified as disabilities under the Ontario Human Rights Code.

This medical discussion paper presents a brief overview of the principles behind the assessment and treatment of addictive disorders, describes changes in addiction diagnostics in the DSM-5, and reviews selected topics commonly encountered in cases before the Workplace Safety Insurance Appeal Tribunal (WSIAT).

2. Definitions:

The newest version of the diagnostic criteria for psychiatric and addictive disorders, the Diagnostic and Statistical Manual, 5th Edition (DSM-5), was published in May, 2013 by the American Psychiatric Association [6]. With this publication, the terms "abuse" and "dependence" were be eliminated in preference of the term “Substance Use Disorders” (e.g. Alcohol Use Disorder rather than Alcohol Abuse or Alcohol Dependence). A review of current terminology is given below (see [4]):

Substance Use Disorder (SUD): A cluster of cognitive, behavioural and physiological symptoms indicating that the affected individual continues using the substance despite significant substance-related problems. The diagnostic criteria for SUDs are listed below:

Criterion A: A problematic pattern of substance use leading to clinically significant impairment or distress, manifested by at least two of the following eleven criteria over the past 12 months:

1. The substance is often taken in larger amounts or over a longer period than was intended.

2. A persistent desire or unsuccessful efforts to cut down or control substance use.

3. A great deal of time is spent in activities necessary to obtain the substance, or to use and recover from its effects.
4. Craving, or a strong desire or urge to use the substance.
5. Recurrent substance use resulting in failure to fulfill major obligations at work, school or home.
6. Continued substance use despite recurrent social or interpersonal problems caused or exacerbated by substance effects.
7. Important social, occupational or recreational activities are curtailed or reduced because of substance use.
8. Recurrent substance use in situations in which it is physically hazardous.
9. Substance use is continued despite knowledge of having a psychological or physical problem that is likely to have been caused or exacerbated by the substance.
10. Tolerance, as defined by: a) a need for markedly increased amounts to achieve substance intoxication or desired effect; b) a markedly diminished effect with continued use of the same amount of the substance.
11. Withdrawal, as manifested by: a) The characteristic withdrawal syndrome for the substance upon discontinuation or reduction of use; b) the substance (or related compound) is taken to relieve or avoid withdrawal symptoms.

Remission Criteria:

a) Early Remission – Have not meet above criteria in past 3-12 months;

b) Sustained Remission – Have not meet above criteria for 12 more or longer.

Severity:

Mild – Presence of 2-3 symptoms;

Moderate – Presence of 4-5 symptoms;

Severe – Presence of 6 or more symptoms.

It is notable that with the DSM-5, most of the previous criteria from the DSM-IV from “abuse” and “dependence” were combined in “substance use disorders”, with the exception that “legal” issues were excluded, and craving was added as a new feature. A summary of changes in substance use disorder classification from DSM-IV to DSM-5 in the Table below:

Table 1: Changes in Substance Misuse Classification Between DSM-IV and DSM-5

Change	DSM-IV	DSM-5
Categorical Classification	Abuse and Dependence Diagnoses Included	Elimination of Abuse and Dependence Terminology and Creation of "Substance Use Disorder" Diagnosis
Legal Specifier	Included in DSM-IV Criteria for Abuse (Criterion #3)	No Longer Present as Part of Substance Use Disorder (SUD) Diagnosis
Craving	Not included in DSM-IV	Added to DSM-5 as one of the 11 criteria for SUD Diagnosis (need 2/11 to meet criteria for SUD diagnosis)
Threshold for Diagnoses	Early and Sustained Remission Criteria Present	Retention of Early versus Sustained Remission Criteria Creation of "Mild" (2-3/11), "Moderate" (4-5/11) and "Severe" (6 or more/11) Specifiers for SUD Diagnosis

3. Description of Pathophysiology

a. Causation: Drug addiction is a complex biological process that is thought to be mediated by long-term changes in the mesolimbic dopamine system located in the midbrain of the human brainstem [7], which is modulated by higher brain centers such as the prefrontal cortex. Several other transmitter systems converge on these midbrain dopamine projections, including endogenous opioid peptides (e.g., enkephalins and endorphins), GABAergic, glutamatergic, and endocannabinoid systems. The final common pathway related to the effects of drugs of abuse appears to be activation of mesolimbic dopamine systems (See **Figure 1**). Ultimately, the causes of drug addictions are thought to be multifactorial (e.g., related to the interplay of biological, social, psychological and cultural factors).

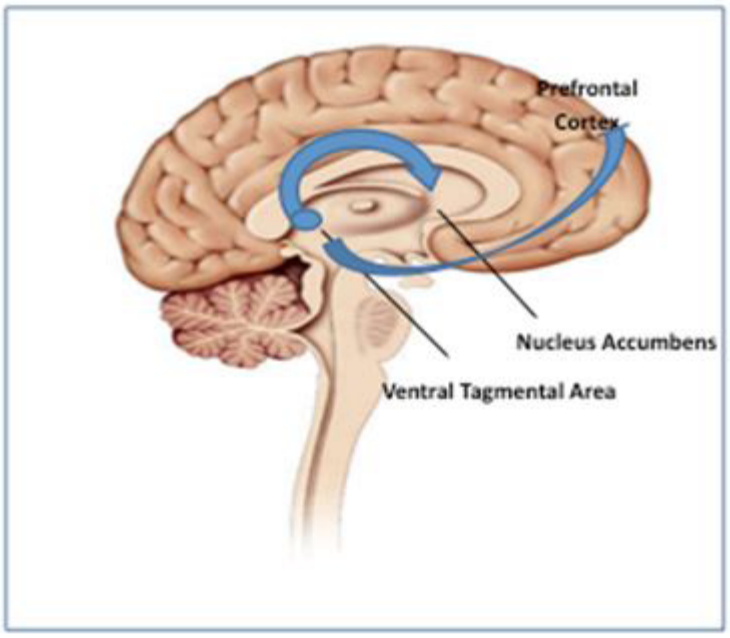

Figure 1 - Dopamine Mesolimbic Pathway

b. Clinical Profile: Drug addiction often progresses from experimental, non-abuse, non-dependent usage to a rapid profile of compulsive drug-seeking and loss of control which proceeds to drug abuse and dependence. Presumably, such progression is mediated by long-term changes in mesolimbic dopamine and related neurotransmitter systems.

c. Natural History: Drug addiction is generally a clinical disorder with an onset in teenage years to early adulthood, with peak expression in middle adulthood. In later years, the course of most drug dependence tends to wax and wane, although in alcohol and other sedative-hypnotic addictions, onset may be in later years (e.g. age range of 30-50s) and be manifest by rapid progression (e.g. “telescoping”).

d. Effects of Drug Treatment on Brain Systems Involved in Addictions: There is evidence to suggest that with treatment and abstinence from drug use and abuse, many of in the changes in brain function described above in section “3a” will eventually reverse, but the time course for this normalization is unknown. However, studies use of drug cue presentation (e.g. exposing drug dependent persons to people, places or things that remind them of previous drug use to stimulate drug craving) suggest that after chronic drug exposure, the brain becomes “hard-wired” to respond to drug cues, which leads to craving, which is a proximate mediator of drug use relapse.

4. Diagnosis: How is it made?

a. Diagnostic Tests: Typically the presence of drug misuse is detected using objective drug screens in urine, blood or saliva. The clinical diagnosis of abuse and dependence is based on clinical history, according to diagnostic schedules such as the DSM-5 and ICD-10.

b. Differential Diagnosis: The clinical presentations associated with drug abuse can mimic several medical and psychiatric disorders, therefore use of urine and blood toxicology can be quite informative to narrow the differential diagnosis to substance abuse.

5. Risk Factors:

It is important to note that both genetic and environmental factors confer vulnerabilities to the initiation and maintenance of drug abuse behaviours. Probably the best example of these dual contributions comes from the Vietnam Twin Registry Studies [8] where American troops who were identical twins (often adopted away at birth) serving in the Vietnam war were followed after they returned from Vietnam (where they were first exposed to heroin and other drug use), and the highest concordance rates of heroin use were found in the order monozygotic twins > dizygotic twins >> non-twin siblings suggesting the importance of genetic contributions to drug addiction. However, even amongst monozygotic twins the concordance rates were 50-60%, suggesting the importance of environmental factors that also contribute towards drug initiation and maintenance.

Several characteristics have been shown to increase the risk for prescription narcotic use, including male gender, age < 41 years, family history of prescription drug use, personal history of substance abuse or psychiatric co-morbidity, a history of legal problems and motor vehicle accidents [9], and a history of adverse childhood events [10]. Moreover, the increasing availability of prescription drugs over the internet has further contributed to rapid and easy access to these agents, which has also compounded the problems in monitoring their use and abuse.

6. Controversies that Surround Addiction: Sorting the Hype from the Facts

The discussion in this section will focus on two important clinical controversies related to prescription of narcotic analgesics:

A) Non-Medical Use of Prescription Narcotic Analgesics.

Despite reductions in the rates of alcohol, tobacco and illicit drugs, rates of prescription narcotic analgesics continue to rise sharply [11]. In the United States, approximately 5% of the population is reported to have used non-prescribed psychotropic medications in the past month, and about two-thirds of this use was of narcotic analgesics. In fact, from 1995 to 2005, the number of Americans abusing controlled prescription drugs jumped from 6.2 to 15.2 million. The most commonly used prescriptions in the USA are hydromorphone drugs (e.g. in combination with acetaminophen), exceeding 100 million in 2005, far exceeding other commonly prescribed drugs such as atorvastatin (63 million) and amoxicillin (52 million). A similar

pattern of use appears to be occurring in Canada [2]. Therefore, the economic and social burden of prescription drug abuse is large and significant, and these persons appear to have much higher (8 to 9-fold) associated healthcare costs as compared to non-abusers [12].

Many persons who go on to abuse prescription narcotic pain medication have undiagnosed or under-treated pain syndromes [12,15]. Despite concerns by physicians and other health care providers that it is undesirable to prescribe larger doses or narcotic pain medication over long periods of time, it is highly recommended that analgesic medications should be prescribed in sufficient doses and in sufficient length of treatment to adequately control acute or chronic pain [13]. However, in cases of insufficient pain relief, patients may escalate their use in an attempt to self-control their pain. The term “pseudoaddiction” has been used in such cases. It has been observed in such cases that: 1) patients are using higher doses to achieve pain relief, not to achieve a “high”; 2) with sufficient increases in the narcotic analgesic dose by the treating physician, these aberrant behaviours will subside. Again, the key to success in treating such patient with chronic pain syndromes with narcotic analgesics is careful monitoring and follow-up by the treating physician.

B) Physicians encountering patients needing acute and chronic pain control who have histories of substance use disorders.

In pain treatment settings, >90% of patients reported receiving opioids for the management of chronic pain syndromes. Rates of drug abuse in these settings have been estimated to be between 18-41% [11], with one study in chronic lower back pain patients suggesting a specific prevalence of 36-56% [14]. While the presence of a history of drug or alcohol abuse should be noted in any patient to whom narcotic medication prescription is being considered, the presence of such a history should not be considered an absolute contraindication [15], as these medications can have clear benefits for pain management in such individuals. Careful monitoring of such patients (as with any patient prescribed these medications) is warranted, and the frequency and quantity of such prescriptions should be minimized, with more frequent visits to the prescribing physician. The use of frequent urine drug testing (UDT) is also an important part of the treatment planning for such patients, and evidence of drug relapse can be quickly obtained. In such cases, the patient can be advised that unless they agree to stop abusing illicit substances or enter drug treatment with evidence of no continuing drug use by UDT, the analgesic pain control treatment may be interrupted, especially in light of concerns about overdoses or drug interactions. The use of screening tools such as the opioid risk tool (ORT) allows prescribers to estimate risk of opioid abuse prior to the initiation of therapy [16]. During treatment, the use of tools such as the Current Opioid Misuse Measure (COMM), which is a tool designed to monitor for aberrant opioid-associated behaviours in patients receiving chronic opioid maintenance analgesic therapies is recommended [17]. It is important that clinicians treating co-morbid pain and substance use disorders employ an integrated approach

which combines appropriate pharmacotherapeutic principles with psychosocial and behavioural therapies [18].

7. Protocols for prescribing narcotics to persons with a history of drug or alcohol abuse

It is a frequently perceived that use of narcotic pain medications in persons with addiction histories is contraindicated. However, in many cases use of these agents in acute pain settings is necessary and consistent with compassionate treatment. Strategies to minimize the chance of drug diversion and initiation of narcotic pain addictions are also important.

In cases where such prescriptions are required, careful monitoring of prescriptions and usage should be a priority. Agents with longer half-lives and less propensity for abuse potential (e.g. methadone and buprenorphine) should be considered over short-acting, short-half life agents such as oxycodone and hydrocodone. The use of an opioid treatment agreement (OTA) is highly recommended, as it outlines the therapeutic goals of opioid therapy, responsibilities of both patient and physician, and designation of a single pharmacy source for obtaining prescriptions [19]; such plans have been shown to increase treatment compliance and decrease the risk of illicit drug use or relapse.

The use of accepted pharmacological and behavioural treatments should be strongly considered in such individuals, under close medical supervision. Pharmacological treatments for opioid addiction include naltrexone (opioid antagonist used as a relapse-prevention strategy), and agonist-maintenance treatments (an agonist is an agent which stimulates a drug receptor, mimicking the effects of the endogenous neurotransmitter) including methadone and buprenorphine [3]. Behavioural treatments include drug counseling (both individual and group), motivational interviewing (to engage patients, and build insight into their drug problems), and cognitive-behavioural and social skills training (to teach patients to manage cravings, and reduce exposure to high-risk situations associated with drug relapse). In addition, therapeutic interventions directed to dysfunctional relationships in the patient's life should also be addressed such as that with the spouse and/or family.

8. Issue of Drug Dependence Entitlement that is the Sequelae of Narcotic Pain Medication Treatment for a Compensable Injury: The Need for Accommodation in the Workplace and Appropriate Compensation

Addiction to narcotic analgesics is unfortunately a common complication of the treatment of chronic pain, and not easily predictable. In fact, the current state of the science in predicting who will become a narcotic abuser after a therapeutic trial of

prescription opioids for analgesia is far from accurate, and there is a need for better predictive tests [13]. Nonetheless, the occurrence of narcotic addiction is a predictable sequela of pain treatment for workplace injury, and when it does occur, it is a problem that requires professional treatment and monitoring. Therefore, reimbursement for a compensable injury/condition should be considered if: 1) there is evidence of compulsive drug-seeking with resultant psychological and physical dependence, and significant functional impairment in daily life is present; 2) attempts by the patient and physician who prescribed the narcotics to reduce the severity and consequences of the narcotic addiction have failed. Drug treatment (both pharmacological and psychosocial interventions) is a mandatory part of the evaluation process, and should be done by experienced treatment professionals working in the setting of an accredited treatment facility. A Panel or Vice Chair should consider if it is of benefit to the addicted individual to be compensated up to the completion of successful inpatient and/or outpatient drug treatment based on their progress towards the goals set in their treatment towards addressing their drug addiction, and improving their functioning in service of returning to work.

9. Questions and Answers (Q&A):

A) Are Addictions a "Personal Choice"?

While it is clear that in many cases individual who misuse drugs and alcohol can make the decision to stop using addictive substances, in many cases of more severe presentations of substance use disorders, these addictive behaviours become involuntary [20], and the personal choice element is circumvented. In such case, professional assistance is often needed. This likely relates to the observation that chronic drug and alcohol use can cause permanent changes in the brain's reward and reinforcement centres based on neuroimaging studies in populations with addictive disorders [21] (See Figure 1).

B) What are the Signs and Symptoms of Drug-Seeking Behaviours, and their Relationship to Drug and Alcohol Misuse.

Prior to the onset of addictive disorders, there is often a history of impulsivity, pre-morbid novelty/drug-seeking behaviours and drug use experimentation, which typically begins in adolescence [22]. There is a long-standing theory known as the "gateway hypothesis" which suggests that early use and experimentation with drugs such as alcohol, and tobacco lead to progression to use of illicit drugs such as cannabis, heroin, and cocaine; however, this hypothesis has been criticized, and perhaps better accounted for by common genetic, neurobiological and environmental factors to the initial and maintenance of addictive behaviours [23].

C) What is the Relationship between Addictions and Posttraumatic Stress Disorder (PTSD)?

There is strong evidence that addictive disorders are highly co-morbid with PTSD (50-70%; [24]) and that drug and alcohol misuse may occur as a self-medication response to acute traumatic experiences which qualify for the PTSD diagnosis [25]. However, it is important to note that not all people exposed to a traumatic event develop PTSD, and not all people who develop PTSD in response to a traumatic event initiate and maintain a co-morbid addictive disorder. This speaks to the issue of resilience, and that there are complex biological, psychological and social determinants of health, which lead to the expression of PTSD and/or co-morbid drug and alcohol addictions [26].

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