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Alcoholism: The Self-Reinforcing Feedback Loop

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1. Introduction

Healthcare in the 18th and 19th centuries was primarily focused on infectious illnesses, such as smallpox, influenza, measles and polio. The development of the biomedical model (which specifically acknowledged that diseases could be explained by physical processes connected with injury, imbalance, or infection) represented a major advance in healthcare, facilitating the development improved hygiene practices, vaccines and antibiotics. In contrast to such historical healthcare priorities, in developed countries today, the major reasons for medical treatment and mortality are chronic illness and accidents (Catalbiano, Sarafino, & Byrne, 2008). Indeed, the current health priority areas in Australia are cancer, cardiovascular disease, diabetes, mental health, obesity, injury prevention/control, arthritis/ musculoskeletal conditions and asthma (AIHW, 2011). The risk factors for these contemporary health priorities are not only physical, but include important and complex behavioural and social interactions. Therefore, a biopsychosocial approach (Fig 1) is required in the current healthcare climate, acknowledging the contribution of physical, behavioural and social factors to health (Catalbiano et al., 2008).

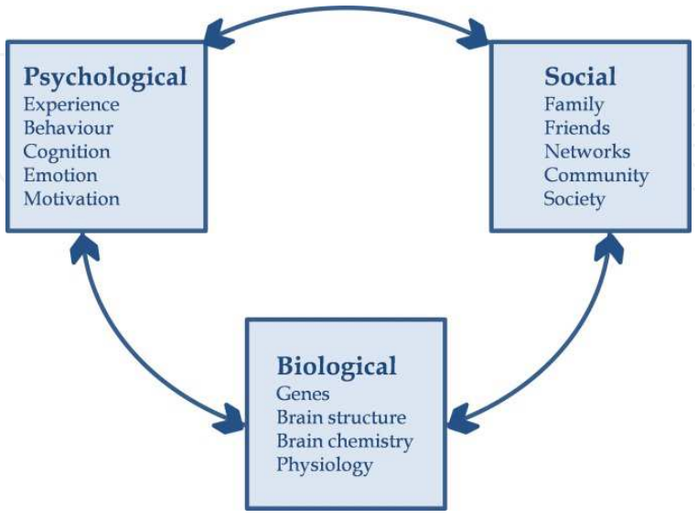

Fig. 1. Biopsychosocial model (adapted from Catalbiano et al., 2008).

Elevated alcohol consumption (along with smoking, lack of exercise and poor diet) represents an key behavioural risk factor for chronic illness and accident and injury, as well as many other costs at the personal and social level (Anderson, Chisholm, & Fuhr, 2009; Carr, 2011; Casswell & Thamarangsi, 2009; Room, Babor, & Rehm, 2005). Alcohol-use disorders are a particularly disabling contributor to the global disease burden (Rehm et al., 2009). Alcohol-use disorders include issues of alcohol *dependency* and *abuse* (Carr, 2011; Rehm et al., 2009), defined in Table 1.

Definitions of Alcohol Abuse and Dependence

Alcohol Abuse

a. "A maladaptive pattern of substance use leading to clinically significant impairment or distress, as manifested by one (or more) of the following, occurring within a 12-month period:

1. *Recurrent [alcohol] use resulting in a failure to fulfil major role obligations at work, school, or home*
2. *Recurrent [alcohol] use in situations in which it is physically hazardous*
3. *Recurrent [alcohol]-related legal problems*
4. *Continued [alcohol] use despite having persistent or recurrent social or interpersonal problems caused or exacerbated by the effects of [alcohol]*

b. The symptoms have never met the criteria for [Alcohol] Dependence"

DSM-IV-TR, p199.

Alcohol Dependence

"A maladaptive pattern of substance use leading to clinically significant impairment or distress, as manifested by three (or more) of the following, occurring at any time in the same 12-month period:

1. *Tolerance, as defined by either of the following:*
   a) *A need for markedly increased amounts of [alcohol] to achieve intoxication or desired effect*
   b) *Markedly diminished effect with continued use of the same amount of [alcohol]*
2. *Withdrawal, as manifested by either of the following:*
   a) *The characteristic withdrawal syndrome for [alcohol]*
   b) *The same (or a closely related) substance is taken to relieve or avoid withdrawal symptoms*
3. *[Alcohol] is often taken in larger amounts or over a longer period than was intended*
4. *There is a persistent desire or unsuccessful efforts to cut down or control [alcohol] use*
5. *A great deal of time is spent in activities necessary to obtain [alcohol], use [alcohol], or recover from its effects*
6. *Important social, occupational, or recreational activities are given up or reduced because of [alcohol] use*
7. *The [alcohol] use is continued despite knowledge of having a persistent or recurrent physiological or psychological problem that is likely to have been caused or exacerbated by [alcohol]"*

DSM-IV-TR, p199

Table 1. DSM-IV definitions of Alcohol Abuse and Dependence

The predictors of alcohol-use disorders are varied and complex, including family history (Eve 1989), genetics (Ginter & Simko, 2009; Hansell et al., 2009) and social and familial learning environment (Fergusson, Lynskey et al., 1994; Fergusson & Horwood 1998). The physical and cognitive consequences of alcohol-related problems impact negatively on the ability to engage with treatment (Dorrian, 2010; Williamson, 2009a). Stigma and stereotypes surrounding alcohol-related problems frequently damage crucial support relationships with friends and family (Dorrian, 2010; Schomerus et al., 2011) and healthcare professionals (Crothers & Dorrian, 2011; Durand, 1994). Despite this, research suggests that, at a global level, attempts to address alcohol-related issues are inadequate (Casswell & Thamarangsi, 2009). Problematic alcohol use represents a critical issue in global healthcare.

This chapter will discuss the prevalence and cost of alcohol *abuse* and *dependence*, the effects on brain and body, risk factors for the development of alcohol-use disorders, family and social support, current treatment approaches and the importance of positive, supportive interactions with healthcare professionals. This discussion will feed into the development of a biopsychosocially-grounded self-reinforcing feedback model of alcoholism, where the very nature of the illness serves to perpetuate its development and presents barriers to treatment.

2. Prevalence and cost of alcoholism

Alcohol is an important part of the economy in many countries, giving rise to employment and trade. Alcohol also represents an important part of social and family culture for many people, having associations with celebration, commiseration and relaxation (NAS, 2006). Most of the global population abstain, or drink at levels that do not warrant concern. Approximately 50% of men and two in three women have abstained from alcohol during the last year (WHO 2011). However, alcohol, which has been referred to as "*the oldest drug of abuse*" (Carr, 2011, p9), can lead to serious harm.

Approximately one in ten drinkers engages in *heavy episodic* drinking (consuming >60g of alcohol, approximately 5 standard drinks, on a single occasion). This type of drinking pattern is highly associated with short term risks, including injury. The male:female ratio of heavy episodic drinking is approximately 4:1. Indeed, men substantially outnumber women in all measures of alcohol consumption (WHO, 2011), including rates of alcohol-use disorders. The global estimate of prevalence of alcohol-use disorders among 15 to 64 year-olds in 2004 was 6.3% for men, 0.9% for women and 3.6% overall (Rehm et al., 2009). In the US, it has been estimated that alcohol-use disorders affect up to 25 million adults (Carr, 2011).

Evaluations in the US suggest that one in three adults consume alcohol at risky levels, and that approximately 15% binge drink, and 5% drink heavily (Carr, 2011). A recent report indicates that in Australia, one in five people drink at risky levels for lifetime harm (>2 standard drinks daily), and nearly one in three drink at risky levels for short-term harm (>4 standard drinks per occasion). More than other drugs, alcohol consumption has been cited as the greatest serious community concern in Australia (AIHW, 2010).

Alcohol is in the top 12 risk factors for global causes of disease burden in both developing and developed countries (NAS, 2006). Globally, nearly 4% of deaths have been attributed to alcohol. Further, 4.6% of Disability Life Years (which take into account years lost through early death as well as years lived with disability) have been ascribed to alcohol consumption (Rehm et al., 2009).

A recent study, which estimated the total economic impact of alcohol across 12 countries (Australia, Canada, France, Germany, Japan, The Netherlands, New Zealand, Portugal, Sweden, South Korea, Thailand, USA), found that it equated to between 0.45 and 5.44% of Gross Domestic Product (Thavorncharoensap, Teerawattananon, Yothasamut, Lertpitakpong, & Chaikledkaew, 2009). For high income countries, productivity loss has been identified as accounting for the largest proportion of alcohol-attributable costs (72%), followed by direct health costs (13%)(Rehm et al., 2009).

The yearly cost of alcohol-related social issues in Australia in 1998-99 was estimated to be $7.6 million, with $5.5 billion tangible costs. The greatest proportion of this (34%) occurred in the workplace, through lost productivity and reduced capacity due to absenteeism. This was followed by road accidents (33%), crime (22%), lost production in the home (7%) and health costs (4%)(NAS, 2006).

Alcohol results in increased risk of accident and injury, not only for the individual, but for those around them. It is also associated causally with more than 60 diseases. Table 2 displays a quote from the most recent World Health Organisation (WHO) report on alcohol and health, which summarises these effects.

World Health Organisation statement, 2011
"The harmful use of alcohol results in approximately 2.5 million deaths each year, with a net loss of life of 2.25 million, taking into account the estimated beneficial impact of low levels of alcohol use on some diseases in some population groups…Alcohol consumption is the world's third largest risk factor for disease and disability; in middle-income countries, it is the greatest risk. Alcohol is a causal factor in 60 types of diseases and injuries and a component cause in 200 others. Almost 4% of all deaths worldwide are attributed to alcohol, greater than deaths caused by HIV/AIDS, violence or tuberculosis. Alcohol is also associated with many serious social issues, including violence, child neglect and abuse, and absenteeism in the workplace." *World Health Organisation (WHO), 2011, p10-11.*

Table 2. Quote from the WHO regarding the negative impact of harmful use of alcohol.

3. Brain and body effects

Alcohol stimulates the reward centres of the brain, heavily influencing dopamine, as well as other neurotransmitters. It activates similar pathways to other addictive drugs including benzodiazepines, barbiturates and opiates (Carr, 2011). Alcohol induces relaxation and euphoria, while at the same time impairing motor skills and judgement (NAS, 2006).

3.1 Brain damage

Neuronal damage due to chronic alcohol use is widespread, however, much research attention has focused on the diencephalon, limbic system, and in particular, the frontal lobe

(Carr, 2011). Studies suggest reduced glucose-utilisation in the frontal lobes (Kopelman, 2008; Moselhy, Georgiou, & Kahn, 2001). Autopsies of individuals with chronic drinking patterns reveal frontal volume loss and decreased neuronal counts (Kopelman, 2008). Neuropsychological testing indicates that individuals with alcohol-use disorders display reduced functioning on frontal lobe tasks (Kopelman, 2008).

Table 3 shows a list of some of the characteristics of individuals who experience frontal lobe dysfunction. Such difficulties are common among individuals with alcohol-use disorders. As can be seen from this list, these types of impairments can have a direct negative impact on risk-taking behaviours (e.g. impulsivity, disinhibition, reduced attention), and relationships with friends and family (e.g. abnormalities of emotion, apathy, shallowness), as well as the capacity to decide to reduce or cease drinking, and engagement with healthcare professionals and treatment programs (e.g. decrease in will and energy, problems with planning and problem solving, poor motivation and decision making).

Characteristics of frontal lobe dysfunction	
• Disorders of categorising • Decrease in voluntary motor behaviour • Difficulty shifting response set • Abnormalities in emotion • Apathy • Indifference • Shallowness • Difficulty in creative thinking • Reduced capacity to plan future actions • Reduced artistic expression • Poor spatial working memory	• Decrease in will and energy • Tendency to engage in perseverative behaviour • Problems with short-term memory • Problems with problem-solving • Impulsivity • Disinhibition • Poor motivation • Problems with decision-making • Poor language and motor control • Reduced ability to sustain attention
Reviewed in Moselhy et al., 2001	

Table 3. Summary of characteristic indicators of impairment in individuals with frontal lobe deficits.

Further, alcohol effects the formation of new long-term memories and can induce black-outs (Lee, Roh, & Kim, 2009; White, 2003). It has been suggested that black-outs may contribute to the likelihood of developing alcohol-use disorders, as perception of the effects of alcohol may be limited to the positive effects, and negative impact may be forgotten during black-out periods (Lee et al., 2009).

3.2 Illness, disease and injury

Continuing alcohol issues are associated with a 200-300% increase in the likelihood of early death. Among the most frequent causes of death are cirrhosis of the liver, heart disease, cancer, stroke and accidents and injuries, which include burns, falls and drowning (Carr, 2011; Schuckit, 2009). It has been estimated that alcohol-use disorders may be causally

related to approximately 50% of liver disease-related deaths. Alcohol-use disorders have been implicated in head and neck cancer. It has also been estimated that people with alcohol-use disorders have twice the risk of oesophagus, rectum and breast cancers (Schuckit, 2009). While low to moderate alcohol consumption has been shown to have a protective effect on the cardiovascular system, higher levels of consumption are related to stroke and heart failure (reviewed in Room et al., 2005; Carr, 2011).

Alcohol has also been associated with impaired endocrine function, resulting in problems with libido and reproductive capability, and increased risk of spontaneous abortion (Carr, 2011). Excessive alcohol consumption also interferes with vitamin and mineral absorption, often resulting in thiamine deficiency, which can lead to Wernicke's encephalopathy, characterised by problems with balance, gait, confusion and memory loss. Severe thiamine deficiency can also lead to Korsakoff 's syndrome, which is characterised primarily by severe anterograde amnesia. When the two sets of symptoms are present together, this is typically referred to as Wernicke-Korsakoff Syndrome (Carr, 2011; Schuckit, 2009).

Withdrawal from alcohol and the detoxification process are also associated with a spectrum of health issues. Symptoms may include anxiety, sleep problems, vivid dreams, headache, nausea, dangerously increased heart rate, elevated blood pressure, sweating, tremors, impaired heat regulation, seizures and delirium tremens (delirium and shaking). These symptoms may be fatal in up to 5% of cases (Carr, 2011). Further, repeated detoxification may result in reduced brain plasticity and longer healing times for frontal/executive processes (Loeber et al., 2010).

Failure to diagnose and address an alcohol-use disorder can result in complications with other illnesses, including psychiatric problems (Schuckit, 2009). Even when alcohol-use disorders have been identified, managing concomitant alcohol-related chronic illness can be very difficult. Patients with alcohol-use disorders are more likely to have post-operative complications related to bleeding and infection (Carr, 2011). An individual experiencing one or more of the chronic illnesses mentioned above will be likely to require several medications. Such medications may interact with alcohol, and a patient with alcohol-related memory impairments may have reduced capacity to remember to take correct numbers of medications at the right time of day, in the right dosage (Dorrian, 2010).

The physical, medical, risk, psychological and family/social implications of alcohol-use disorders are summarised, in alignment with the biopychosocial approach, in Table 4.

4. Risk factors for alcoholism

As with many other mental illnesses, family history is an important risk factor for alcohol-abuse disorders, with studies suggesting a heritability rate as high as 60% (Eve, 1989; Ginter & Simko, 2009). This raises classic nature versus nurture questions about whether it is the genes or the family environment that is responsible (Morrison, Bennett, Butow, Mullan, & White, 2008). Certainly, research has identified genetic factors which predispose an individual to developing alcohol-related issues (Ginter & Simko, 2009; Hansell et al., 2009). This is further supported by adoptee studies (Morrison et al., 2008).

The biopsychosocial spectrum of alcoholism-related consequences				
bio----------psycho----------social				
Direct physical damage	**Associated diseases**	**Risk**	**Cognitive/ Psychological**	**Family/Social**
Brain Gastrointestinal system (in particular, the liver) Cardiovascular system Endocrine system Vitamin and nutrient absorption Immune system Dehydration Blood thinning	Cancers Epilepsy Cardiovascular disorders (heart disease, stroke) Gastrointestinal disease (cirrhosis of the liver) Diabetes mellitus Wernicke's Encephalopathy Infections	Motor vehicle accident Falls Drowning Poisoning Trauma Burns	Frontal lobe dysfunction (see Box 4) Unipolar depressive disorders Suicidal ideation Anxiety Korsakoff's Psychosis Confusion Hallucinations	Family deprivation Unintentional injury Interpersonal violence Injury/fatality caused through drink-driving Reduced job performance Absenteeism Spread of STD Maternal and perinatal disorders Judgments from others
Summary from reviews: Anderson et al., 2009; Government of Australia, 2006; Room et al., 2005; Carr, 2011; Rehm et al., 2009; Schuckit, 2009				

Table 4. Summary of negative physical consequences, associated disease and illness, risks, cognitive and psychological issues and family and social problems associated with alcohol-use disorders.

On the other hand, family and social learning experience are also predictors of alcohol consumption patterns later in life. Exposure to alcohol before 6 years approximately doubles the likelihood of reporting frequent, heavy or problem drinking during adolescence (Fergusson, Lynskey, & Horwood, 1994). Not only do parental drinking behaviours increase risk of developing problematic alcohol behaviours (Eve 1989), but also violence between parents, particularly violence initiated by the father (Fergusson & Horwood, 1998), and maltreatment and abuse as a child (Gilbert et al., 2009; Magnusson et al., 2011). Taken together, these studies suggest that permissive attitudes to alcohol in the home

environment, as well as violence or trauma in the home, may increase the likelihood of later development of problem drinking behaviours (Fergusson, Boden, & Horwood, 2008).

A recent study suggests that early drinking behaviours may be more strongly determined by family environment, whereas, later in life, genetics may be more important (Kendler, Schmitt, Aggen, & Prescott, 2008). Other research suggests an interaction, where early exposure to alcohol may enable expression of genes related to vulnerability (Agrawal et al., 2009). Clearly, both genes and the environment are important.

Psychopathology has also been heavily implicated in alcohol-use disorders. Depression and alcohol-use disorders are frequently comorbid (Fowler, 2006). Indeed, in adolescents comorbidity between depression, suicide and alcohol abuse has been estimated to be as high as 73% (Ganz & Sher, 2009). Alcohol problems are also frequently comorbid with anxiety and post-traumatic stress disorders (Carr, 2011). Mood may provide a motive for drinking (Young-Wolff, Kendler, Sintov, & Prescott, 2009). Indeed, a self-medication hypothesis has been proposed, where individuals may be using alcohol to reduce anxiety, depression, or negative mood more generally (Ganz & Sher, 2009). This is supported by studies of negative mood and behaviour, including evidence for use of alcohol to reduce nervousness (Swendsen et al., 2000), depression in adolescents (Deykin, Levy, & Wells, 1986), psychological distress as a result of sexual assault (Miranda, Meyerson, Long, Marx, & Simpson, 2002), and anxiety in individuals with social phobia (Carrigan & Randall, 2003). However, it is important to note that psychopathologies such as depression and anxiety can be symptoms of alcohol withdrawal or detoxification, and that such disorders may simply tend to have an earlier onset age, and therefore appear to be predisposing factors (Swendsen et al., 2000).

Not only has trauma early in life been identified as a risk factor for alcohol-related problems (Gilbert et al., 2009; Magnusson et al., 2011), alcohol-use disorders with an onset later in life may be triggered by an unpleasant or traumatic event in adulthood (Johnson, 2010; Sacks & Keks, 1998). Alcohol abuse has been associated with disaster, exposure to grotesque death, physical and sexual abuse in adulthood, and combat in military service (reviewed in Stewart, 1996). Increased volume and frequency of alcohol consumption has been linked to loss of a spouse in older men (Byrne, Raphael, & Arnold, 1999). Pilot work has also suggested that females who have recently lost spouses who themselves had alcohol issues, and who also had unresolved marital problems or were socially isolated, may be more likely to experience alcohol issues as a response to grieving (Adele, 1989).

Overall, there are many factors that may, at least partially, explain why individuals develop alcohol-use disorders.

5. Family and social effects

Traditional stereotypes of people with alcohol problems include scruffy, derelict, amoral, weak-willed individuals without friends or family (Carr, 2011; Catalbiano et al., 2008). However, while people in lower socioeconomic groups are at increased risk of alcohol-use disorders, large proportions of individuals with such problems are highly functioning professionals (Catalbiano et al., 2008). Further, British research indicates that higher education level is a risk factor for problem drinking and daily alcohol consumption (Huerta & Borgonovi, 2010). In addition, as discussed in Section 4, there is increasing evidence for

multiple predisposing factors that may render individuals particularly vulnerable to alcohol-use disorders, such as genetics (Kendler, Myers, Dick, & Prescott, 2010), early exposure to patterns of drinking in the home (Fergusson et al., 1994; Kendler et al., 2008), and trauma (Sacks & Keks, 1998).

Despite this information, a recent review revealed persistent stigma associated with alcohol dependence. Compared with other mental illnesses that are not linked to substance abuse, individuals with alcohol dependence were more likely to trigger negative emotions and social rejection, and were also less likely to be perceived as having a mental illness. The level of danger attributed was equivalent to that associated with schizophrenia. The authors concluded that alcohol dependence was particularly stigmatised, that individuals were more likely to be blamed for their condition (Schomerus et al., 2011). Given the current context, with understanding of the biopsychosocial determinants of alcohol-use disorders, the question remains, why do stigma and negative stereotyping persist?

One possible explanation may lie in the fact that alcohol-use disorders often involve behaviour which puts others at risk. In a large scale Australian survey completed by more than 26,000 respondents, recent drinkers were asked whether they had done certain potentially harmful activities during the past year while drunk. Thirteen per cent reported that they had driven a vehicle, 6% reported engaging in verbal abuse, 5% reported going to work, 4% reported that they created a disturbance, damaged or stole goods, and 1% reported engaging in physical abuse. Overall, one in five recent drinkers reported engaging in at least one potentially harmful activity while intoxicated (AIHW, 2010). The same study revealed that, within the preceding year, one quarter of participants over the age of 14y had been verbally abused, 8% had been physically abused, and 14% had been put in fear by someone under the influence of alcohol (AIHW, 2010). In addition, there may be specific negative impacts on those caring for an individual with an alcohol-use disorder. A survey of 110 concerned family members and significant others (CSOs) of people with alcohol or other substance abuse reported one or more problems in emotional, family, relationship, financial, health or violence domains (Benishek, Kirby, & Dugosh, 2011).

Another potential reason for the continued negative feeling towards patients with alcohol-use disorders may be alcohol-induced impairment of social cognition. Indeed, in line with the frontal lobe impairment discussed earlier, research indicates that excessive alcohol use may result in difficulties with understanding the stress, rhythm and intonation of speech, problems understanding emotional content of facial expressions, theory of mind impairment and issues with humour processing (Uekermann & Daum, 2008). Further, consistent with other addiction-related disorders, alcohol-use disorders are frequently characterised by deceit, guilt and shame (reviewed in Shaffer et al., 2004). Coupled with emotional abnormalities, indifference, shallowness and apathy (Table 3), this can clearly have a negative impact on interpersonal communication, and ultimately result in damage to crucial support relationships.

6. Alcohol-use disorders, prevention and treatment

At a societal level, there is evidence that alcohol price increases and reductions in alcohol availability and advertising, as well as legally enforced drink-driving penalties may be beneficial in the prevention of alcohol-use disorders (Rehm et al., 2009; Room et al., 2005).

Prevention and treatment approaches at the individual level, and the importance of the relationship between individuals with alcohol-use disorders and healthcare professionals are discussed below.

6.1 Individual-level treatment approaches

Early moral perspectives on alcohol-use disorders considered alcohol-related behaviours to be under the control of the individual, and those with problem behaviour patterns were blamed and punished (Morrison et al., 2008). It is clear that such perspectives are out-dated and counterproductive. A goal in alcohol-use disorder treatment today is to maintain a non-judgemental attitude (Sacks & Keks, 1998), and to acknowledge the importance of the biology, experience and social environment of the individual (Morrison et al., 2008).

Comprehensive care necessitates support and management at intervention, in detoxification and withdrawal, during acute alcohol-related health threats, and throughout on-going follow-up care. This process should include education, individual and possibly group therapy, and special care to address comorbid psychopathologies (Carr, 2011). Family involvement and other sources of psychosocial support are also critical (Carr, 2011; Sacks & Keks, 1998). Medications such as acamprosate and naltrexone, which help to reduce dependence, may be included. However, these should not be employed in isolation. While they are aimed at addressing physical dependence issues, psychological dependence must also be treated (Garbutt, West, Carey, Lohr, & Crews, 1999; Graham, Wodak, & Whelan, 2002).

Central to the success of current treatment approaches is the patient's readiness and willingness to change, and their resulting level of engagement and compliance (Catalbiano et al., 2008; Holmwood, 2002; Sacks & Keks, 1998). Willingness predicts retention in treatment and positive change in substance use (Erickson, Stevens, McKnight, & Figueredo, 1995). Conversely, those who are less willing to change are less motivated and report lower treatment demand (Ekendahl, 2007). It is important to note that, due to the physiological effects of alcohol, especially the frontal lobe impairment (e.g. decrease in will and energy, problems with planning and problem solving, poor motivation and decision making, Table 3), it may be particularly difficult for patients, particularly those with advanced alcohol-use disorders, to make the decision to change, and to comply with treatment. Even indications of readiness to change may not be indicative of future treatment involvement (Yonas et al., 2005). Indeed, "*waiting for the addict to 'be ready' for treatment can be dangerous*" (Clay, 2008, p1).

Many treatments for alcohol-use disorders focus on abstinence. However, there has been a great debate in the literature as to whether individuals with alcohol-use disorders, following a period of abstinence can learn to modify their behaviour and engage in controlled drinking (Catalbiano et al., 2008). This approach has been argued to be most appropriate for young people, with fewer alcohol-related problems (McMurran, 1991), but may not be appropriate for individuals with longer-term chronic alcohol issues (Catalbiano et al., 2008). Nevertheless, it must be recognised that abstinence may not be a realistic goal for all individuals and that relapse is frequent (Graham et al., 2002; Sacks & Keks, 1998). This may be particularly important to acknowledge in situations where individuals have alcohol-related chronic illness, where medications may have reduced efficacy, or even become harmful, with high or fluctuating levels of alcohol in the bloodstream. In such cases, open

acknowledgement that abstinence may not be observed, and non-judgemental discussion of alcohol consumption, may lead to safer and more efficacious pharmacological management of the concomitant chronic illness (Dorrian, 2010).

6.2 Interactions with healthcare professionals

Table 5 displays a quote, which summarises many of the current issues related to attitudes and training of healthcare professionals in treatment of individuals with alcohol-use disorders. Research suggests that positive, supportive, non-judgemental interactions with healthcare professionals are critical (Sacks & Keks, 1998). However, healthcare professionals may have negative attitudes to working with patients with alcohol-use disorders (Clay, Allen, & Parran, 2008; Durand, 1994), particularly professionals without specialist training in working with individuals with substance use problems (Albery et al., 1996). Among doctors, including General Practitioners, reported barriers include lack of training, inadequate expertise and time constraints (Durand, 1994; Geirsson, Bendtsen, & Spak, 2005), prejudice against individuals with alcohol-use disorders, and negative perceptions about the potential efficacy of treatment (Carr, 2011). To address some of these negative attitudes, it has been argued that understanding pharmacological as well as cognitive-behavioural treatments should facilitate practitioner optimism in treatment of people with alcohol-abuse issues, specifically, "*an understanding of the biological reality of addiction allows physicians to understand addicts as having a brain disease*" (Clay et al., 2008, p1).

Carr, 2011
"Historically, we have attributed addictive illness, including alcoholism, to wilful misconduct, character flaws, weak will, moral turpitude, or just bad people. Science does not support these outdated stereotypes. In 1956, the American Medical Association declared alcoholism an illness. Hampered by prejudice, misinformation, and an outdated sense of hopelessness at our supposed inability to effect meaningful intervention, the medical community has been slow to respond. Even today, most medical students and residents complete training without benefit of a rudimentary working knowledge of addictive illness; an illness they will see in their office almost daily for the rest of their careers." *Carr, 2011, p9-10.*

Table 5. Quote from Carr, 2011 summarising issues in the medical community.

Nurses are at the coal-face of healthcare, and also have the potential to make a substantial contribution to alcohol-use disorder prevention, screening and treatment (George, 1988). While overall, recent studies find evidence for neutral or positive attitudes toward the care of patients with alcohol-use disorders, suggestions remain of negative, stereotyped attitudes towards these patients. For example, studies have demonstrated that nurses may be more likely to describe patients labelled as being 'alcoholics' as more unsocial, boring, uncooperative and unpleasant (Wallston et al., 1976). In a recent study of Australian nurses, 14% reported that they did not want to work with drinkers, and 13% did not feel that they would find working with drinkers rewarding. In this study, none of the participants

reported receiving drug and alcohol training (Crothers & Dorrian, 2011). In contrast, in a study in a small community hospital with a specialised inpatient drug and alcohol program, nurses reported positive attitudes to working with drinkers (Allen, 1993). Indeed, similar to studies in doctors, nursing studies have consistently indicated gaps and opportunities for training in the identification, treatment and ongoing support of patients with alcohol-related issues (Anderson, Eadie, MacKintosh, & Haw, 2001; Owens, Gilmore, & Pirmohamed, 2000). Studies yield expressions of interest from nursing staff in working more in this area, and requests for more training (Anderson et al., 2001; Owens et al., 2000). This is clearly an important area for development, since education results in more positive attitudes to care (Allen, 1993; Geirsson et al., 2005).

Emergency department staff may also play a particularly critical role. A study of Scottish Accident and Emergency Departments found that one in seven admissions were related to alcohol consumption. However, 40% of departments did not routinely screen for alcohol problems, or keep related records (Anderson et al., 2001). In an Australian study of emergency department staff, including doctors and nurses, only 5% reported routinely screening for alcohol problems, 16% reported routinely directing short interventions, and 27% reported routinely referring for specialist treatment. A primary barrier identified by staff was motivational deficiency on the part of the patients. Again, this study highlighted a requirement for additional training (Indig, Copeland, Conigrave, & Rotenko, 2009). In another Australian study, interns failed to identify 84% of heavy drinkers who attended a casualty department, which was not in alignment with their perceptions of what was required in terms of quality healthcare. This further highlights shortcomings with training (Gordon, Fahey, & Sanson-Fisher, 1988).

Therefore, without further training and support (infrastructure, time, evidence-based techniques) for healthcare professionals, specific treatment of alcohol-use disorders may be inadequate or overlooked. There is evidence that treatment may be so focused on the acute, and potentially life-threatening, related health problems experienced by individuals with alcohol-use disorders, longer-term, consistent follow-up to treat the underlying alcohol-use issues themselves may not occur (Baird, Burge, & Grant, 1989; Dorrian, 2010). This can be conceptualised as a reactive treatment of symptoms as they arise, as opposed to addressing the cause.

A further barrier to working with patients with alcohol-use disorders is that they may not seek treatment. Only 13% of individuals with alcohol dependency will receive specific treatment for their addiction (Carr, 2011). Only one in four people with alcohol-use disorders will pursue treatment, and most will approach their General Practitioner (Schuckit, 2009). Patients may be worried about health care professionals maintaining confidentiality (Gordon, Ettaro, Rodriguez, Mocik, & Clark, 2011), or may be concerned about the treatment approaches (Durand, 1994). However, the difficulties that the patient must contend with relating to stereotyping and stigma from the general community as well as healthcare professionals should not be underrated. *"People living with dependency problems must strive for recovery (often relapsing along the way) within communities and families which often despise them and/or their condition"* (Williamson, 2009, p9). This stigma may represent a significant hurdle for treatment. Further, as discussed earlier, alcohol-related brain damage can harm individual ability to understand risk and to plan, commit and be motivated to

change behaviour. This issue of impaired agency and a reduced capacity to "*choose health*" has been largely overlooked in treatment and public policy (Dorrian, 2010; Williamson, 2009a, 2009b).

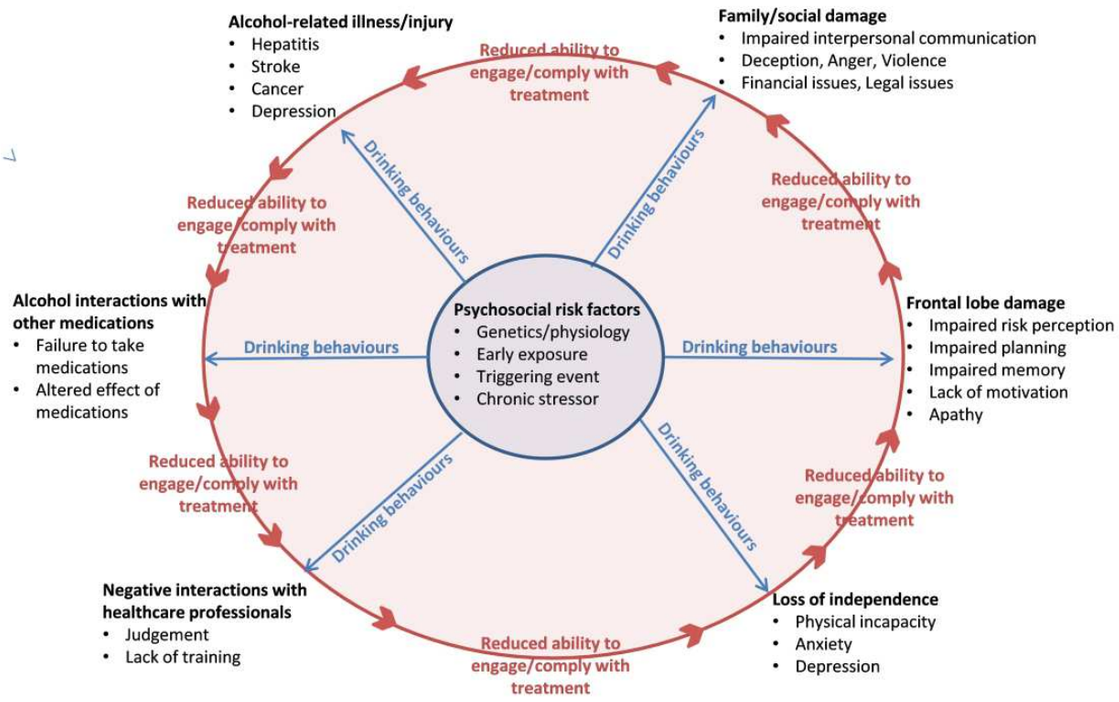

Fig. 2. Alcohol-use disorders as a self-reinforcing (positive) feedback loop.

7. Conclusions

Taken together, alcohol-use disorders can be seen as a self-perpetuating feedback loop, where all aspects of the disease serve to reduce the ability to engage and comply with treatment. This is illustrated in Figure 2, which displays psychosocial risk factors for developing alcohol-use disorders at the centre. Negative outcomes associated with alcohol-use disorders are displayed around the perimeter of the circle. Each outcome— frontal lobe damage, family/social damage, alcohol-related illness, alcohol interactions with other medications, negative interactions with healthcare professionals and loss of independence, all amplify the other effects of the disease, and make it increasingly difficult for the individual to move towards positive behaviour change. It is clear that holistic, biopsychosocial thinking is required to address problems with alcohol-use disorders. In particular, it must be acknowledged that the most seriously ill patients will have progressed further in this loop, and current treatment approaches and public policy which emphasise individual choice will likely be completely inadequate. Final recommendations resulting from the review are displayed in Table 6.

Recommendations
• The importance of support from friends, family and the wider community for those with alcohol-use disorders cannot be overstated. This support is required at times when these relationships are put under particular strain. Stigma and stereotypes of individuals with alcohol-use disorders must be addressed at a community level, and among healthcare professionals, as they are out-dated, unhelpful and present barriers for treatment • Education for healthcare professionals in evidence-based identification, treatment and follow-up for individuals with alcohol-use disorders is absolutely required and desired by the professionals themselves • This education must emphasise the importance of positive, supportive, non-judgemental interactions and provide a clear understanding of alcohol addiction as a relapsing brain disease, with recognised biological and social risk factors • Education will also facilitate increased routine screening for patients particularly those who may be identifiable as 'at-risk' (e.g. older, bereaved individuals, those with frequent hospital admissions for burns, falls or common alcohol-related chronic illness) • Public level policies and education may be demonstrably effective, as may current treatments with a central focus on readiness to change, but these may have limited influence for those with impaired cognitive capacity who may not be able to "*choose health*" • We cannot overlook the most ill patients of alcohol-use disorders, and dedicated and innovative research and development of treatments and support systems for those who have reduced agency is crucial

Table 6. Summary recommendations

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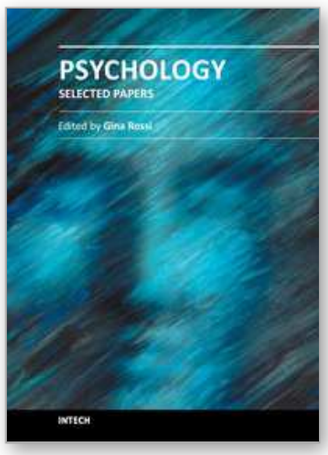

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