# Treatment of alcohol use disorder from a psychological point of view

## *Trattamento del disturbo da uso di alcol da un punto di vista psicologico*

GIOVANNA CORIALE[1]*, DANIELA FIORENTINO[1], FRANCESCA DE ROSA[1], SIMONA SOLOMBRINO[1], BRUNA SCALESE[1], ROSARIA CICCARELLI[1], FABIO ATTILIA[1], MARIO VITALI[2], ALESSIA MUSETTI[1], MARCO FIORE[3], MAURO CECCANTI[1];
INTERDISCIPLINARY STUDY GROUP CRARL, SITAC, SIPaD, SITD, SIPDip**
*E-mail: gcoriale@tin.it

[1]Centro Riferimento Alcologico della Regione Lazio (CRARL), Sapienza University of Rome, Italy
[2]ASUR Marche-AV4, Italy
[3]Institute of Cell Biology and Neurobiology (IBCN-CNR), Rome, Italy

**SUMMARY.** The development of a treatment for alcohol use disorder (AUD) is a crucial and complex moment. Indeed, the information gathered by a team of professionals (physicians, psychologists and social workers) (bio-psycho-social model of AUD) interact to choose the most appropriate cure. As for AUD psychological treatment, it is of considerable importance to avoid clinical treatments leading to drop-out for improving the patients quality of life. Psychoanalytic and behavioral techniques were early utilized as psychological treatment of AUD, however, evidence-based approaches as motivational interviewing (MI) and cognitive behavioral therapy (CBT) are recently used in AUD. In this work we review the more effective and appropriate AUD psychological treatments.

**KEY WORDS:** alcohol use disorder, AUD, AUD treatment, treatment plan, cognitive behavioral intervention, motivational interviewing, follow-up.

**RIASSUNTO.** L'elaborazione del piano di trattamento rappresenta un momento molto delicato e complesso del processo terapeutico del disturbo da abuso di alcol (DUA). È la fase in cui le informazioni raccolte da un'équipe di professionisti (medici, psicologi e assistenti sociali) (modello bio-psico-sociale del DUA) vengono messe insieme per decidere il percorso terapeutico più adatto. Per quanto riguarda la parte psicologica, è di notevole importanza scegliere un trattamento clinico in grado di ridurre al minimo la mancata adesione al trattamento e, per i soggetti che rimangono in trattamento, di garantirne l'efficacia. Se da una parte, le tecniche psicoanalitiche e comportamentali hanno fornito le basi della terapia psicologica dell'alcolismo, dall'altra, gli approcci basati sull'evidenza scientifica sono stati elaborati a partire dai principi del colloquio motivazionale e della terapia cognitivo-comportamentale. In questo articolo viene fornita una panoramica dei trattamenti che sono risultati più efficaci nel trattare il DUA e delle modalità temporali più adeguate per monitorare l'efficacia del trattamento.

**PAROLE CHIAVE:** disordine da uso di alcol, DUA, trattamento del DUA, piano di trattamento, intervento cognitivo-comportamentale, colloquio motivazionale, follow-up.

### INTRODUCTION

Alcohol use disorder (AUD) is a complex and heterogeneous phenomenon. The kind, the amount and frequency of alcohol intake are extremely variable between people[1-3]. Alcohol abuse may be also discovered in combination with other recreational drugs[4]. AUD coexists, contributes or may be the effect of different psychiatric disorders[5,6]. All these factors may crucially influence AUD morbidity but also the help request by people attending appropriate structures for outcome treatments[7]. The choice of a psychological treatment that takes into account the clinical characteristics of the AUD person asking for help is a key factor to reduce mortality (lack of adherence to treatment) and to ensure the effectiveness of the treatment[8]. The development of a treatment schedule is a critical moment for patients with AUD because the information collected by physicians and psychologists are assembled to decide the most appropriate cure. A useful psychological model to recognize when and how to proceed in AUD is described in the Alcohol Needs Assessment Research[9] and is based on the International Classification of Diseases (ICD-10)[10]. This model categorizes the AUD patients by analyzing amount and drinking frequencies (Figure 1). The at risk drinking (*hazardous drinking*) is the first category with low level of drinking that could lead to harmful consequences[10,11], although, currently no at risk levels of consumption are universally recognized in the world. The World Health Organization (WHO) defines the daily at-risk drinking the consumption of 20-40 g of alcohol for women and 40-60 g for man[12]. Usually people who fall into this category do not ask for a

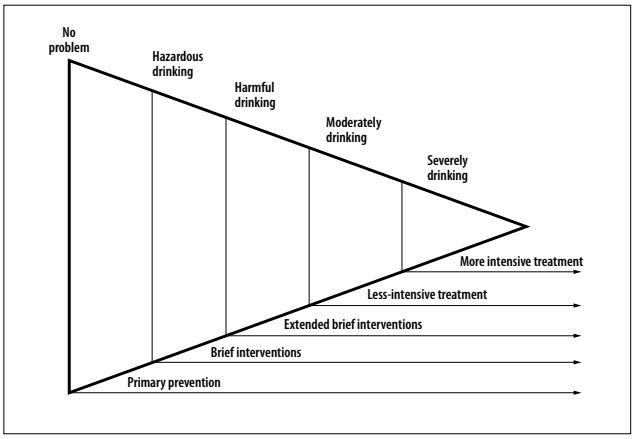


Figure 1. Alcohol Use Disorder categories and proposed methods of intervention[10].

clinical support. The second category is the *harmful drinking* eliciting physical and/or mental damage[10]. A regular alcohol consumption of 40 g for women and 60 g for men (or more) indicates the intake pattern of this clinical category[12]. AUD people of this category may casually attend medical structures for alcohol consequences as home or car accidents, pancreatitis, etc. The third category includes the AUD dependent people (*moderately* or *severely drinking*) defining a well-established pattern of people with alcohol-related problems and often looking for clinical support. The severity criteria of the DSM-5 for alcohol addiction can be used to define the dependence and its severity.

For hazardous or harmful drinking is strongly suggested a brief intervention (BI) or a motivational interview (MI)[13,14]. The treatment of the hazardous drinking could be carried out also in a no specialized context (primary care physician or emergency room), while the harmful drinking, as well as for the full alcohol dependence, should be treated in a specialized unit for dependence. In particular, for people in the category of alcohol addiction the treatment should be more intensive.

The treatment aims are: *i*, to improve the patient quality of life, through positive changes in physical and mental conditions, and socio-economic situations[15]; *ii*, the total abstinence from alcohol. However, a controlled drinking may be considered and negotiated with the patient at the beginning of treatment for ensuring a better adherence to treatment[16] since controlled drinking may be proposed or accepted in the case of at risk drinking or mild dependence but not for addicted people[17].

The involvement of family members and/or friends is strongly recommended because AUD people family members experience or are at risk in developing a range of physical stress and psychological problems needing themselves a support, a factor useful in engaging and motivating the AUD patient[18].

## PSYCHOLOGICAL EVIDENCE-BASED TREATMENT

Maintaining an AUD person adherent to treatment, especially in the first three months of abstinence, it is one of the biggest problems for professionals. The scientific literature documents drop-out levels ranging from 50% to 80%[19]. The choice of the "right" treatment is than essential not only for the efficacy of the treatment but also to create a culture of shared clinical findings facilitating the operators in the choice of "what to do" and "how to do" and for ensuring the dissemination of knowledge[20]. The evidence-based approaches for curing AUD have been developed and validated taking into account the motivational interviewing (MI) and the cognitive behavioral therapy (CBT)[21,22] because easy to deliver in a standardized and scientific form. Miller and Wilbourne[23] reviewed the treatment AUD outcomes of 381 studies. Among the psychosocial treatments, the treatments based on MI and CBT ("brief intervention, social skills training, the community reinforcement approach, behavioral contract, couples therapy and case management") resulted to be strongly efficient. Khan et al.[24], in a systematic review study, pointed out the effectiveness of CBT if associated with medical treatment (see Table 1 for the treatments' efficacy grading of evidence and recommendations).

There is unanimous accord on the fact that heavy drinking results in high economic costs for the society due to health and social cares, losses to productivity, and criminal activity[25]. It is crucial to develop and validate evidence-based approaches for psychological treatment of AUD offering both best chances of success but also those with affordable costs compared to others. As for the costs question, many psychosocial treatments, including MI and training in social skills, have been shown to be useful in reducing the economic costs[26]. The project MATCH funded in the USA by the National Institute on Alcohol Abuse and Alcoholism, showed substantial improvements in drinking status for all three treatments took into account (Cognitive Behavioral Coping Skills Therapy – CBT; Twelve-Step Facilitation Therapy – TSF; Motivational Enhancement Therapy - MET) with little difference between treatments at either the 1-year or the 3-year follow-up points[27,28]. The United Kingdom Alcohol Treatment Trial[29] decided to use in their study MET on the grounds of cost-effectiveness also considering the most relevant findings from Project MATCH that a less intensive and less costly treatment (MET) did offer significantly equal outcomes than two more intensive and expensive treatments (CBT and TSF) (Evidence A, Recommendation 1 of Table 1).

### Motivational approach

MI and MET refer to a clinical 4-sessions trials in the MATCH project developed by Miller and Rollnick[30]. The authors defined them as "client-centered", aimed at increasing the motivation to change, through exploration and resolution of ambivalence. The motivation is not an approach based on the comparison. It considers the change of drinking habits as a result of a decision[23]. The motivational approach includes a range of concepts, therapeutic techniques and relational styles. The main issues are: to express empathy, investigate and resolve the ambivalence, roll with resistance and support self-efficacy. The treatment aims to motivate a change in the behavior linked to drinking, stimulating and supporting the use of cognitive and behavioral resources possessed by the patient but without providing additional sessions for the training or

building new skills. The motivational treatment is short, often also limited to a single session for the MI and up to four for the MET. The MI evolved over the years shifting from a simple technical methodology to a more important role of the relational aspects of the clinical interview. A meta-analysis study[31] showed: 1) a high variability in the clinical efficacy of treatment; 2) a trend of the positive effects to decrease in the course of time. The authors suggest that when used as an independent treatment, the initial interviews, possibly administered in a short time, should be followed by follow-up at 1, 3, 6, 12 months. Furthermore, if followed by further treatments of different approaches, the positive initial effects of motivational approach could be considerably reinforced. In another meta-analysis study, the authors[32] have stressed the following points: 1) the motivational approach, also in shorter form, would be very effective to produce positive effects in the short time (within three months of "abstinence"); 2) would be more effective with subjects with low dependence and "binge" intake (Evidence A, Recommendation 1 of Table 1).

## Cognitive behavioral approach

The cognitive behavioral approach includes a range of therapeutic programs that are essentially based on the concepts of the social learning theory and the theory on stress and coping[33,34]. The inability to handle stressful situations in everyday life and specific risk situations, combined with culturally determined expectations of the positive effects of alcohol would be responsible for the abuse of alcohol or for the relapse after failed attempts to remain abstinent[35]. Alcohol dependence is a learned behavior that can be changed by applying cognitive and behavioral techniques. It is crucial provide at beginning techniques that increase motivation to quit or cut down on drinking, followed by the use of tools that help the patient: to identify situations at risk for drinking, to understand the consequences of drinking and to debate dysfunctional ideas that control behavior related to drinking, to prevent relapse and to improve social skills and stress management. In the Mesa Grande project[23], the authors examined a large number of scientific studies, confirming the effectiveness of cognitive-behavioral approach in the treatment of alcohol dependence (Evidence A, Recommendation 1 of Table 1).

Although cognitive-behavioral interventions may share many concepts and techniques, they can differ by duration, methods, content and treatment settings[36]. Below are listed some of the interventions.

## Relapse prevention

Relapse is an event frequently experienced especially in the first three months of abstinence[35,37,38]. It was also noted that specific situations (situations at risk for drinking) are associated with relapses. Negative emotions seem to account for the 35% of drop-out, the social pressures by 20%, interpersonal conflicts by 16%, the desire to drink by 9%, and 3% negative physical states[39]. The program of relapse management (Relapse Prevention - RP) provides not only cognitive-behavioral strategies that help to manage and prevent relapse but also general strategies not directly related to the use of alcohol that allow a lifestyle balance[40-43]. A detailed description of the method is showing in Dimeff and Marlatt[43] and Parks et al.[44]. Several authors[45] analyzing the clinical papers published using the RP came to the following conclusions:

- RP is effective in reducing and/or to make "less destructive" the relapse limiting the quantities drinking;
- RP works with severe addicted patients;
- RP acts not only on the relationship with alcohol, but also improving considerably the psychosocial functioning;
- RP can be used in different contexts;
- RP is more effective if used in combination with pharmacological treatments.

The effectiveness has been confirmed indeed by many studies[24,45,46] (Evidence A, Recommendation 1 of Table 1).

Table 1. Treatments' efficacy grading of both evidence and recommendations.

| **Grading of evidence** | **Notes** | **Symbol** |
|---|---|---|
| High quality | Further research is very unlikely to change our confidence in the estimate of effect and clinical practice | A |
| Moderate quality | Further research is likely to have an important impact on our confidence in the estimate of effect and may change the estimate and clinical practice | B |
| Low or very low quality | Further research is very likely to have an important impact on our confidence in the estimate of effect and is likely to change the estimate and clinical practice. Any estimate of effect is uncertain | C |
| **Grading of recommendation** | **Notes** | **Symbol** |
| Strong recommendation warranted | Factors influencing the strength of the recommendation included the quality of the evidence, presumed patient-important outcomes, and cost | 1 |
| Weaker recommendation | Variability in preferences and values, or more uncertainty: more likely a weak recommendation is warranted. Recommendation is made with less certainty; higher cost or resource consumption | 2 |

*Adapted from*: European Association for the Study of Liver. EASL clinical practical guidelines: management of alcoholic liver disease. J Hepatol 2012; 57: 399-420.

### Behavioral Self-Control Training

Behavioral Self-Control Training (BSCT) is a clinical approach that uses essentially behavioral techniques aimed at moderating drinking (*controlled drinking*). Although the treatment has been criticized by many, its efficacy has been well documented by meta-analysis studies[17,22,30,47]. In particular, moderation is possible especially for patients experiencing not so serious problems related to drinking and with a short story of AUD[8,41,48]. The BSCT includes eight steps to be given in this order: 1) Definition of the amount to drink; 2) Self-monitoring of drinking; 3) Controlling alcohol ingested; 4) Teaching the skill to reject an offering to drink; 5) Establish a list of rewards if the goals are achieved; 6) Learn to recognize the antecedents of drinking; 7) Learn coping skills different from drinking; 8) Learn to prevent that a relapse becomes the beginning "of a drink without control". There are advantages in choosing moderation as a goal of treatment[49]:

- there are some people who might reject the goal of abstinence without having first experienced a period of moderate drinking;
- if the patient is not able to pursue the goal of moderation, the therapeutic relationship could be used to continue working on the possibility to have abstinence as a main;
- if the patient reaches successfully controlled drinking, the goal should be achieved with a relatively brief intervention;
- finally, many people who reach the goal of controlled drinking may naturally choose the abstinence.

A meta-analysis study confirmed an increased efficiency of BCST to reduce consumption compared with other treatments of controlled drinking [22] (Evidence A, Recommendation 1 of Table 1).

### Cognitive Behavioral Marital Therapy

Cognitive Behavioral Marital Therapy (CBMT) is based on the social learning theory. It uses specific techniques, such as a behavioral contract or training for proper communication, to support the patient for change and restoring the balance in the couple. Several CBMT related programs have been developed[50,51]. CBMT assumes that both alcohol-related problems and relational functioning influence each other: once the AUD has developed, the abuse of alcohol can impair relationships and this in turn can lead to aggravate the AUD. Despite this vicious circle, the couple can be an important resource, able to stimulate and support a change[52]. BCMT appears to be very effective in reducing the alcohol consumption when compared with other treatments that do not include the spouse involvement[53]. A meta-analysis work[54] confirms the effectiveness even greater than the individual treatment with the same approach. The major disadvantage is that not always the spouse has time and resources to available to spend in BCMT processes, however BMCT may be considered useful alternative AUD treatment (Evidence A, Recommendation 1 of Table 1).

### Coping Skills Training

The Coping Skills Training (CST) is based on the assumption that drinking is a non-functional way to handle the emotional stress in interpersonal situations[55]. The training provides functional strategy skills for managing interpersonal stress without alcohol contribution. Monti et al.[55] have validated the skills training program for individuals or groups as allows:

- to strengthen or build interpersonal skills to manage better relationships (assertive communication techniques and listening);
- to manage emotions and then regulate emotional level (technical anger management and stress);
- to handle situations related to drinking (coping with the desire to drink, and with refusing the offer of drinking).

The CST has accumulated over time many scientific evidences of effectiveness in reducing consumption to improve the quality of life[8,56]. The CTS is considered one of the most effective treatments with a good cost/benefit ratio[23]. Patients with a weakness in social skills may have greater benefit mainly when administered in combination with other treatments[56,57] (Evidence A, Recommendation 1 of Table 1).

### Group therapy

AUD is a significant challenge to health costs, so it is crucial to identify the appropriate treatment for this disorder[58]. Group therapy, involving more patients, can significantly moderate the economic costs. Group therapy efficacy has been shown in studies, comparing individual CBT and MI versus the group format of both[59,60]. The studies have shown that there are no differences between individual treatment and the group treatment in terms of alcohol consumption, adherence to treatment, patient satisfaction and percentage of patients who achieve abstinence[59,60]. A recent Cochrane meta-analysis[61] has shown, despite the low quality of the studies taken into account, the same positive results of alcohol intake reduction of both group and individual motivational interviews. Other studies have shown the efficacy of group CBT involving patients with dual diagnosis[62]. Another recent study has taken into account the treatment for the prevention of relapse based on mindfulness[63] demonstrating a reduction of alcohol consumption, an increase in awareness, a greater skill to avoidance or manage "stimuli" that can lead to a relapse and an increase in cognitive flexibility and a high degree of patient satisfaction[64]. In conclusion, exposure techniques, training of coping skills, cognitive behavioral group techniques in general, and relapse prevention strategies specifically, are the most effective treatment modality to achieve positive results in the treatment of AUD[65] (Evidence A, Recommendation 1 of Table 1).

## AVAILABLE CLINICAL RESOURCES TO SUPPORT THE THERAPEUTIC SCHEDULE

### Self-help groups

The self-help groups for alcohol addiction are formed by people who share the same problem, with the aim of helping

each other. Below, we will discuss the best known associations in alcohol addiction field. The Club of Alcoholics in Treatment (CAT) is a multi-family communities, based on the practice of self/mutual help and solidarity among families who have alcohol-related problems. The creator of the Club is Vladimir Hudolin, World Health Organization consultant, famous for having conceived the program of the first Club in Zagreb in the 1964. They consist of a minimum of two to a maximum of twelve families and patients with AUD and a "servant-teacher", that is a person who has been trained to deal with alcohol-related problems operating on a voluntary basis. They meet weekly with his servant-teacher to face and share their discomforts and experiences[66,67]. Club's attention is focused not only on alcohol problems but also on family and social distress. Particularly the alcoholic problems are considered whole family problems, which is also followed and helped to change their lifestyle and to grow and mature along with the alcoholic person[68]. CAT depends on zonal associations (the ACAT), which in turn relate to regional associations (or provincial) the ARCAT (or APCAT), confluent in turn into a national association, the AICAT. The latter has representation and coordination functions and support the activities of CAT. The few studies performed to evaluate the efficacy, confirmed the positive effects in attending the CAT abstinence groups[69].

### Alcoholics anonymous

Alcoholics anonymous (AA) is an association of self-help, spread throughout the world, which deals with the recovery of people who have problems of AUD. It was born in 1935 in the United States and then spread in over 160 countries. As the name suggests, the association guarantees the anonymity and therefore can avoid revealing the patients identity. They are open access and is configured as a place to exchange experiences and put into practice the recovery program, known as the "twelve steps" method, that is a step a day during the week to quit drinking. There are no other restrictions of any kind, nor social, nor ethnicity, gender or religion. In parallel to the AA groups operate: 1) the Al-A with the purpose of helping families of alcoholics to manage the negative effects caused by alcohol abuse in a family member or a friend and 2) Alateen, specific recovery program for teenagers. Many studies have shown a positive correlation between AA attendance and abstinence[70,71]. It is important to emphasize that the group therapy and self-help groups are not equivalent. The latter are not therapy groups but play an important role in the recovery process. This type of program is indicated to support the patient in the maintenance of abstinence from alcohol and provide an opportunity to understand and explore the emotional and interpersonal conflicts that can have contributed to the development and maintenance of AUD.

### Therapeutic community

The framework law on alcohol and related problems (no. 125/2001) introduced the possibility, even for alcoholics, to make use of residential and semi-residential facilities established for care, rehabilitation programs and territorial reintegration. Many therapeutic communities for drug addiction also admit alcoholics, but only a few have started a specialization module and special training for working with alcohol-specific problems. The therapeutic community has not yet become an effective response of care for patients with AUD. Frequently, alcoholics have a history of drug abuse or current dependence from other substances in addition to alcohol to set benefit therapeutic community. There is a common agreement in the scientific and clinical field in considering that, differently from programs for addiction, the specific Community proposals for alcoholics should have different characteristics: 1) of shorter length; 2) with specific treatment programs for AUD; 3) strong connection, starting already from the residential phase, with territorial structures such as SERT or outpatient alcohol unit[72,73].

## CONCLUSIONS

AUD treatments consist in activating clinical processes not so easy to perform but with long lasting duration. Currently, professionals dealing with AUD can choose from a wide range of treatment options for their patients[74]. The work of physicians and psychologists has been greatly enriched by scientific researches on AUD that expand and potentiate the knowledge on the biochemical effects of alcohol in the brain and its relationship with changing behavior[75-84]. Furthermore, it has been evaluated the effectiveness of many psychological treatment protocols[24].

It is worth to underline that no treatment (medical or psychological) is possible without the motivation of the patient to quit drinking. A further crucial step of AUD cure is to early assess and reinforce patient motivation to ensure adherence treatment[47,85]. Maintaining an AUD subject with dependence in the treatment, especially during the first three months of abstinence, is one of the major problems to overcome. In order to avoid drop-out, much attention should be paid to the choice of treatment[19]. The CBT has accumulated many scientific evidences overtime, especially when combined with both motivational and pharmacological treatments[24], and it is considered a quite useful tool for curing AUD. Patients with AUD show a considerable variability in responding to the treatment leading also to different results. Numerous studies have found that one year after the beginning of the treatment, 2/3 of patients fall again in the problem[9]. Critical moments emerge three months after the beginning of abstinence: 66% of relapses occur in the first 3 months, most of these arise in the 1st month[10,13]. Scientific data show that the changes which occur the first three months, when properly supported by the right treatment, could be maintained in the next months [14,15]. On the other hand, while some people manage to positively remain abstinent and to maintain the positive changes after completing a therapeutic program, others require a more intensive and long lasting treatments to achieve the same results[16].

Some evidences suggest that there are same variables (specific characteristics of functioning) that can interfere or potentiate the treatment success: for example patients who are motivated to change have a more positive prognosis[17-19] than those with higher degree of severity of addiction or psychiatric issues[16,17]. It's clear that the recovery process is not linear and the outcomes depend very much on the psycho-

logical and social patient characteristics and on his/her alcohol habits. From what has been said it is clear that: 1) therapeutic interventions should be intensive in the first three months of treatment; 2) treatments should be diversified according to patient characteristics; for highly motivated patients, with no serious dependence, the programs may be less intensive and short (at least three months of treatment followed by follow-up at one month, three, six and twelve months after treatment)[31]; the programs should be more intensive and long-lasting for patients with severe alcohol addiction associated with psychopathological problems and for poly-addicted people (at least 6 months of treatment followed by follow-up for monitoring the recovery)[86,87].

*Conflict of interests*: the authors have no conflict of interests to declare.

****Interdisciplinary Study Group - Centro Riferimento Alcologico Regione Lazio (CRARL), Società Italiana per Il Trattamento dell'Alcolismo e delle sue Complicanze (SITAC), Società Italiana Patologie da Dipendenza (SIPaD), Società Italiana delle Tossicodipendenze (SITD), Società Italiana di Psichiatria e delle Dipendenze (SIPDip)**: Giovanni Addolorato, Vincenzo Aliotta, Giovanni Alessandrini, Maria Luisa Attilia, Giuseppe Barletta, Egidio Battaglia, Gemma Battagliese, Ida Capriglione, Valentina Carito, Onofrio Casciani, Pietro Casella, Fernando Cesarini, Mauro Cibin, Paola Ciolli, Angela Di Prinzio, Roberto Fagetti, Emanuela Falconi, Michele Federico, Giampiero Ferraguti, Simona Gencarelli, Angelo Giuliani, Antonio Greco, Silvia Iannuzzi, Guido Intaschi, Luigi Janiri, Angela Lagrutta, Giuseppe La Torre, Giovanni Laviola, Roberta Ledda, Lorenzo Leggio, Claudio Leonardi, Anna Loffreda, Fabio Lugoboni, Simone Macrì, Rosanna Mancinelli, Massimo Marconi, Icro Maremmani, Marcello Maviglia, Marisa Patrizia Messina, Martino Mistretta, Franco Montesano, Michele Parisi, Esterina Pascale, Roberta Perciballi, Fabiola Pisciotta, Claudia Rotondo, Giampaolo Spinnato, Alessandro Valchera, Valeria Zavan.

## REFERENCES

1. Morley KC, Baillie A, Sannibale C, Teesson M, Haber PS. Integrated care for comorbid alcohol dependence and anxiety and/or depressive disorder: study protocol for an assessor-blind, randomized controlled trial. Addict Sci Clin Pract 2013; 8: 19.
2. Mancinelli R, Binetti R, Ceccanti M. Woman, alcohol and environment: emerging risks for health. Neurosci Biobehav Rev 2007; 31: 246-53.
3. Mancinelli R, Vitali M, Ceccanti M. Women, alcohol and the environment: an update and perspectives in neuroscience. Funct Neurol 2009; 24: 77-81.
4. Stinson FS, Grant BF, Dawson DA, Ruan WJ, Huang B, Saha T. Comorbidity between DSM-IV alcohol and specific drug use disorders in the United States: results from the National Epidemiologic Survey on Alcohol and Related Conditions. Drug Alcohol Depend 2005; 80: 105-16.
5. Pacini M, Maremmani I, Vitali M, Santini P, Romeo M, Ceccanti M. Affective temperaments in alcoholic patients. Alcohol 2009; 43: 397-404.
6. Rich SD, Riley LJ. Neurodevelopmental disorder associated with prenatal alcohol exposure: consumer protection and the industry's Duty to Warn. Amsterdam: Springer International Publishing, 2016.
7. Hesselbrock VM, Hesselbrock MN. Are there empirically supported and clinically useful subtypes of alcohol dependence? Addiction 2006;101 Suppl: 97-103.
8. Raistrick D, Heather N, Godfrey C. Review of the effectiveness of treatment for alcohol problems. London: National Treatment Agency for Substance Misuse, 2006.
9. Drummond DC, Oyefeso A, Phillips T, et al. Alcohol Needs Assessment Research Project (ANARP): the 2004 National Alcohol Needs Assessment for England. London: Department of Health, 2005.
10. World Health Organization. The ICD-10 Classification of Mental and Behavioural Disorders Diagnostic criteria for research. Geneve: World Health Organization, 1994.
11. Edwards G, Arif A, Hadgson R. Nomenclature and classification of drug- and alcohol-related problems: a WHO Memorandum. Bull World Health Organ 1981; 59: 225-42.
12. Rehm J, Room R, Monteiro M, et al. Comparative quantification of health risks: global and regional burden of disease attributable to selected major risk factors. Geneva: World Health Organization, 2004.
13. Moyer A, Finney JW, Swearingen CE, Vergun P. Brief interventions for alcohol problems: a meta-analytic review of controlled investigations in treatment-seeking and non-treatment-seeking populations. Addiction 2002; 97: 279-92.
14. Bertholet N, Daeppen J-B, Wietlisbach V, Fleming M, Burnand B. Reduction of alcohol consumption by brief alcohol intervention in primary care: systematic review and meta-analysis. Arch Intern Med 2005; 165: 986-95.
15. Babor TF, Del Boca FK. Treatment matching in alcoholism. Cambridge, GB: Cambridge University Press, 2003.
16. Cox WM, Rosenberg H, Hodgins CHA, Macartney JI, Maurer KA. United Kingdom and United States healthcare providers' recommendations of abstinence versus controlled drinking. Alcohol Alcohol 2004; 39: 130-4.
17. Sobell MB, Sobell LC. Controlled drinking after 25 years: how important was the great debate? Addiction 1995; 90: 1149-53-77.
18. Moos RH, Finney JW, Cronkite RC. Alcoholism treatment: context, process, and outcome. New York: Oxford University Press, 1990.
19. Fonsi Elbreder M, de Souza e Silva R, Pillon SC, Laranjeira R. Alcohol dependence: analysis of factors associated with retention of patients in outpatient treatment. Alcohol Alcohol 2011; 46: 74-6.
20. Spring B. Evidence-based practice in clinical psychology: what it is, why it matters; what you need to know. J Clin Psychol 2007; 63: 611-31.
21. Burke BL, Arkowitz H, Menchola M. The efficacy of motivational interviewing: a meta-analysis of controlled clinical trials. J Consult Clin Psychol 2003; 71: 843-61.
22. Walters GD. Behavioral self-control training for problem drinkers: a meta-analysis of randomized control studies. Behav Ther 2000; 31: 135-49.
23. Miller WR, Wilbourne PL. Mesa Grande: a methodological analysis of clinical trials of treatments for alcohol use disorders. Addiction 2002; 97: 265-77.
24. Khan A, Tansel A, White DL, et al. Efficacy of Psychosocial interventions in inducing and maintaining alcohol abstinence in patients with chronic liver disease: a systematic review. Clin Gastroenterol Hepatol 2016; 14: 191-202.e4.
25. UKATT Research Team. Effectiveness of treatment for alcohol problems: findings of the randomised UK alcohol treatment trial (UKATT). BMJ 2005; 331: 541.
26. Slattery J, Chick J, Cochrane M, et al. Health Technology Board for Scotland Health Technology Assessment of Prevention of Relapse in Alcohol Dependence Consultation Assessment Report With significant contributions from a broad range of Scottish and UK experts (see Appendix 1). Edimburgo, GB: NHS Scotland, 2002.
27. Project MATCH Research Group. Matching Alcoholism Treat-

ments to Client Heterogeneity: Project MATCH posttreatment drinking outcomes. J Stud Alcohol 1997; 58: 7-29.
28. GROUP PMR. Matching patients with alcohol disorders to treatments: clinical implications from Project MATCH. J Ment Heal 1998; 7: 589-602.
29. United Kingdom Alcohol Treatment Trial (UKATT): hypotheses, design and methods. Alcohol Alcohol 2001; 36: 11-21.
30. Miller WR, Rollnick S. Motivational interviewing: preparing people to change addictive behavior. New York: Guildford Press, 1991.
31. Hettema J, Steele J, Miller WR. Motivational interviewing. Annu Rev Clin Psychol 2005; 1: 91-111.
32. Vasilaki EI, Hosier SG, Cox WM. The efficacy of motivational interviewing as a brief intervention for excessive drinking: a meta-analytic review. Alcohol Alcohol 2006; 41: 328-35.
33. Moos RH. Theory-based active ingredients of effective treatments for substance use disorders. Drug Alcohol Depend 2007; 88: 109-21.
34. Sibilia L, Ceccanti M, Deiana L, Coriale G, Picozzi R. Maintenance of abstinence from alcohol. Lancet 2001; 358: 1103-4.
35. Marlatt GA. Taxonomy of high-risk situations for alcohol relapse: evolution and development of a cognitive-behavioral model. Addiction 1996; 91 Suppl: S37-49.
36. Kadden RM. Behavioral and cognitive-behavioral treatments for alcoholism: research opportunities. Addict Behav 1994; 26: 489-507.
37. Connors GJ, Maisto SA, Zywiak WH. Understanding relapse in the broader context of post-treatment functioning. Addiction 1996; 91 Suppl: S173-89.
38. Mackay PW, Marlatt GA. Maintaining sobriety: stopping is starting. Int J Addict 1991; 25 (9A-10A): 1257-76.
39. Lowman C, Allen J, Stout RL. Replication and extension of Marlatt's taxonomy of relapse precipitants: overview of procedures and results. The Relapse Research Group. Addiction 1996; 91 Suppl: S51-71.
40. Jarvis TJ, Tebbutt J, Mattick RP, Shand F. Treatment approaches for alcohol and drug dependence: an introductory guide. Hoboken, NJ: John Wiley & Sons, 2005.
41. Edwards G, Marshall EJ, Cook CCH. The Treatment of drinking problems: a guide for the helping professions. Cambridge, GB: Cambridge University Press, 2003.
42. Hendershot CS, Witkiewitz K, George WH, Marlatt GA. Relapse prevention for addictive behaviors. Subst Abuse Treat Prev Policy 2011; 6: 17.
43. Dimeff LA, Marlatt GA. Relapse prevention. In: Hester RK, Miller WR (eds). Handbook of alcoholism treatment approaches: effective alternatives, (2nd edition). Needham Heights, MS: Allyn and Bacon, 1995.
44. Parks GA, Anderson BK, Marlatt GA. Relapse prevention therapy. In: Heather N, Stockwell T (eds). The essential handbook of treatment and prevention of alcohol problems. Hoboken, NJ: John Wiley & Sons; 2004.
45. Carroll KM. Relapse prevention as a psychosocial treatment: a review of controlled clinical trials. Exp Clin Psychopharmcology 1996; 41: 46-54.
46. Irvin JE, Bowers CA, Dunn ME, Wang MC. Efficacy of relapse prevention: a meta-analytic review. J Consult Clin Psychol 1999; 67: 563-70.
47. Hester RK, Miller WR. Handbook of alcoholism treatment approaches: effective alternatives. Oxford: Pergamon Press, 1989.
48. Ambrogne JA. Reduced-risk drinking as a treatment goal: what clinicians need to know. J Subst Abuse Treat 2002; 22: 45-53.
49. Hodgins DC, Leigh G, Milne R, Gerrish R. Drinking goal selection in behavioral self-management treatment of chronic alcoholics. Addict Behav 1997; 22: 247-55.
50. O'Farrell TJ, Choquette KA, Cutter HS, Brown ED, McCourt WF. Behavioral marital therapy with and without additional couples relapse prevention sessions for alcoholics and their wives. J Stud Alcohol 1993; 54: 652-66.
51. O'Farrell TJ. Treating alcohol problems: marital and family interventions. New York: Guilford Press, 1993.
52. O'Farrell TJ, Fals-Stewart W. Behavioral couples therapy for alcoholism and drug abuse. J Subst Abuse Treat 2000; 18: 51-4.
53. O'Farrell TJ, Clements K. Review of outcome research on marital and family therapy in treatment for alcoholism. J Marital Fam Ther 2012; 38: 122-44.
54. Powers MB, Vedel E, Emmelkamp PMG. Behavioral couples therapy (BCT) for alcohol and drug use disorders: a meta-analysis. Clin Psychol Rev 2008; 28: 952-62.
55. Monti PM, Gulliver SB, Myers MG. Social skills training for alcoholics: assessment and treatment. Alcohol Alcohol 1994; 29: 627-37.
56. Shand F, Stafford J, Fawcett J, Mattick R. The treatment of alcohol problems: a review of the evidence. Canberrs, ACT, Australia: Publication Production Unit, 2003.
57. Longabaugh R, Morgenstern J. Cognitive-behavioral coping-skills therapy for alcohol dependence. Current status and future directions. Alcohol Res Health 1999; 23: 78-85.
58. SAMHSA. Substance Abuse Treatment: Group Therapy (TIP 41). Rockville, MD: Substance Abuse and Mental Health Services Administration Center for Substance Abuse Treatment, 2005.
59. Marques AC, Formigoni ML. Comparison of individual and group cognitive-behavioral therapy for alcohol and/or drug-dependent patients. Addiction 2001; 96: 835-46.
60. Sobell LC, Sobell MB, Agrawal S. Randomized controlled trial of a cognitive-behavioral motivational intervention in a group versus individual format for substance use disorders. Psychol Addict Behav 2009; 23: 672-83.
61. Klimas J, Field C-A, Cullen W, et al. Psychosocial interventions to reduce alcohol consumption in concurrent problem alcohol and illicit drug users: Cochrane Review. Syst Rev 2013; 2: 3.
62. Gotoh M. [An investigation into the effectiveness of integrated group therapy and prognosis for dually diagnosed patients an invitation for the dual-diagnosis patients to the 12 step group therapy for alcoholics]. Nihon Arukoru Yakubutsu Igakkai Zasshi 2012; 47: 144-54.
63. Witkiewitz K, Lustyk MKB, Bowen S. Retraining the addicted brain: a review of hypothesized neurobiological mechanisms of mindfulness-based relapse prevention. Psychol Addict Behav 2013; 27: 351-65.
64. Carpentier D, Romo L, Bouthillon-Heitzmann P, Limosin F. [Mindfulness-based-relapse prevention (MBRP): evaluation of the impact of a group of Mindfulness Therapy in alcohol relapse prevention for alcohol use disorders]. Encephale 2015; 41: 521-6.
65. Orchowski LM, Johnson JE. Efficacy of group treatments for alcohol use disorders: a review. Curr Drug Abuse Rev 2012; 5: 148-57.
66. Hudolin V. Il club degli alcolisti in trattamento una realta' in continuo cambiamento. Treviso: ARCAT Veneto, 1993.
67. Hudolin V, Sorce V, Galletti L. Il sistema ecologico-sociale dei club degli alcolisti in trattamento. Trento: Edizioni Erickson, 1994.
68. Hudolin V, Gosparini P, Guidoni G, et al. Club degli alcolisti in trattamento (manuale per il lavoro nei club degli alcolisti in trattamento "approccio ecologico sociale"). Trieste: Scuola Europea di Alcologia e Psichiatria Ecologica, 2001.
69. Giuffredi C, Di Gennaro C, Montanari A, Barilli A, Vescovi PP. Alcohol addiction: evaluation of alcohol abstinence after a year of psycho-medical-social treatment. Addict Biol 2003; 8: 219-28.

70. Kownacki RJ, Shadish WR. Does Alcoholics anonymous work? The results from a meta-analysis of controlled experiments. Subst Use Misuse 1999; 34: 1897-916.
71. Ferri M, Amato L, Davoli M. Alcoholics Anonymous and other 12-step programmes for alcohol dependence. Cochrane Database Syst Rev 2006; (3): CD005032.
72. Rossin MR, Bossi M. Alcolismo e comunità terapeutiche. Prospett Soc Sanit 2012; 7: 17-20.
73. Center for Substance Abuse Treatment. Treatment of Adolescents with Substance Use Disorders. Substance Abuse and Mental Health Services Administration (US), 1999.
74. Huebner RB, Kantor LW. Advances in alcoholism treatment. Alcohol Res Health 2011; 33: 295-9.
75. Koob GF. Neurocircuitry of alcohol addiction. In: Handbook of Clinical Neurology. 2014.
76. Koob GF, Volkow ND. Neurocircuitry of addiction. Neuropsychopharmacology 2010; 35: 217-38.
77. Koob GF, Volkow ND. Neurobiology of addiction: a neurocircuitry analysis. Lancet Psychiatry 2016; 3: 760-73.
78. Ciafrè S, Fiore M, Ceccanti M, Messina MP, Tirassa P, Carito V. Role of Neuropeptide Tyrosine (NPY) in ethanol addiction. Biomed Reviews 2016; 27: 27-39.
79. Carito V, Ceccanti M, Ferraguti G, et al. NGF and BDNF Alterations by prenatal alcohol exposure. Curr Neuropharmacol 2017 Aug 24.
80. Ciafrè S, Carito V, Tirassa P, et al. Ethanol consumption and innate neuroimmunity. Biomed Reviews 2018; 28: 49-61.
81. Ceccanti M, Hamilton D, Coriale G, et al. Spatial learning in men undergoing alcohol detoxification. Physiol Behav 2015; 149: 324-30.
82. Ceccanti M, Carito V, Vitali M, et al. Serum BDNF and NGF modulation by olive polyphenols in alcoholics during withdrawal. J Alcohol Drug Depend 2015; 3: 214-9.
83. Ceccanti M, Coriale G, Hamilton DA, et al. Virtual Morris Task Responses in individuals in an abstinence phase from alcohol. Can J Physiol Pharmacol 2018; 96: 128-36.
84. Ceccanti M, Inghilleri M, Attilia ML, et al. Deep TMS on alcoholics: effects on cortisolemia and dopamine pathway modulation. A pilot study. Can J Physiol Pharmacol 2015; 93: 283-90.
85. Demmel R, Beck B, Richter D, Reker T. Readiness to change in a clinical sample of problem drinkers: relation to alcohol use, self-efficacy, and treatment outcome. Eur Addict Res 2004; 10: 133-8.
86. Heather N, Raistrick D, Godfrey C. A summary of the review of the effectiveness of treatment for alcohol problems a summary of the review of the effectiveness of treatment for alcohol problems. The National Treatment Agency for Substance Misuse, 2006.
87. Brambilla R, Vigna-Taglianti F, Avanzi G, Faggiano F, Leone M. Gamma-hydroxybutyrate (GHB) for mid/long term treatment of alcohol dependence: a systematic review. Riv Psichiatr 2012; 47: 269-80.