Alcohol-related disorders
Epidemiology

- Alcohol dependence or abuse is a problem of 13% of the world population.

- Worldwide, alcohol causes 2.5 million deaths (3.8% of total) and 69.4 million (4.5% of total) of Disability-Adjusted Life Years (DALYs).

- There is a causal relationship between alcohol consumption and more than 60 types of disease and injury.

- Alcohol is estimated to cause about 20-30% worldwide of oesophageal cancer, liver cancer, cirrhosis of the liver, homicide, epilepsy, and motor vehicle accidents.

- Men are more exposed to alcoholism than women (3-4x) but percentage of women with alcohol problems increases.
Alcohol consumption
### Per capita recorded alcohol consumption (litres of pure alcohol) among adults (>=15 years)

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(according to World Health Statistics 2010 containing WHO's annual compilation of data)
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Alcohol use disorders:
- abuse
- dependence
- intoxication
- withdrawal
- induced disorders

...and complications
Diagnostic Classification

Abuse
- Maladaptive pattern of use for 12 months causing social, role, or legal problems

Dependence
- Maladaptive pattern of use for 12 months with specific symptoms of dependence
Diagnostic criteria of alcohol dependence.  
**ICD -10**

1. A **craving** or feeling of compulsion to use the alcohol

2. Evident **impairment of the ability to control** use of alcohol. This can be related to difficulties in avoiding initial use, difficulties in discontinuing use, difficulties in controlling the level of use

3. **Withdrawal** state, or use of the substance to mitigate or avoid withdrawal symptoms, and subjective awareness of the efficacy of this behaviour

4. Presence of **tolerance** to the alcohol's effects

5. Progressive **neglect of pleasures**, behaviours or **interests** in favour of using alcohol

6. Persistent **use** of alcohol despite evident presence of harmful consequences.
Diagnostic criteria of alcohol dependence

**DSM - IV**

1. **Tolerance** defined as: need of considerably higher doses of the alcohol to achieve intoxication or the desired effect or a considerably diminished effect with continuous use of the same quantity of the alcohol.

2. **Withdrawal** defined as: the characteristic withdrawal syndrome for the alcohol or the same substance (or a closely related one) being taken to reduce or mitigate withdrawal symptoms.

3. The alcohol is often taken in higher quantities or for longer periods than expected by the subject.

4. Persistent **craving** or unsuccessful attempts to reduce or control use of the alcohol.

5. Considerable time is spent in activities needed to obtain the alcohol, to take it or to recover from its effects.

6. Discontinuation or reduction of major social, working or recreational activities because of the use of alcohol.

7. Continuous use of the alcohol despite the awareness of having a persistent or recurrent problem of a physical or psychological nature or a problem which is exacerbated by the substance.
ICD - 10

- craving / compulsion
  - impairment of the ability to control use
  - use of alcohol despite evident presence of harmful consequences.

DSM – IV

- withdrawal
  - unsuccessful attempts to reduce or control use
  - considerable time is spent on activities needed to obtain alcohol (discontinuation or reduction of major activities)

- tolerance
  - neglect of pleasures, behaviours or interests in favour of using alcohol
  - despite the awareness of having a persistent or recurrent problem
ICD 10

PROBLEM DRINKING
F10.1

Health and social negative consequences

DEPENDENCE
F10.2

Health and social negative consequences + diagnostic criteria (≥3)
SCREENING INSTRUMENTS
CAGE

- **craving** During the last 3 months, have you ever thought you should drink less alcohol?

- **anger** During the last 3 months, have you ever got upset because somebody told you to drink less?

- During the last 3 months, have you ever felt **guilty** because you drank too much?

- **eye-opener** During the last 3 months, have you ever waken-up in the morning with a wish for an alcoholic drink?
The Michigan alcohol Screening Test (MAST) is a 22 (or 25) item questionnaire to screen for lifetime alcohol related problems and alcoholism.

Scores indicate:

- 0 - 2 No apparent problem
- 3 - 5 Early or middle problem drinker
- 6 or more Problem drinker
The role of amygdala

- The central amygdala, a part of the brain involved in emotions such as stress and fear, sending impulses to the ventral tegmental area, locus coeruleus, and laterodorsal tegmental nucleus for activation of dopamine, norepinephrine and epinephrine.

- is important in regulating alcohol consumption.

- Most central amygdala neurons communicate via a chemical signal known as GABA (an inhibitory neurotransmitter).

- Alcohol dependence has been associated with the strengthening of inhibitory synapses in this brain region.
The brain as viewed from the underside and front. The thalamus and Corpus Striatum (Putamen, caudate and amygdala) have been splayed out to show detail.

**Corpus Striatum**

- Caudate nucleus
- Lenticular nucleus (globus pallidus and putamen)
- Amygdala
Etiology

- The environmental factors
- The genetic factors
- The neuromediator systems
  - the norepinephrin system
  - the dopaminergic system
  - the serotoninergic system
  - the cholinergic system
  - the GABAergic system
  - the opioidergic system
The incentive phase

- Dopamine is commonly associated with the pleasure system of the brain, providing feelings of enjoyment and reinforcement to motivate a person to perform certain activities. Dopamine is released (particularly in areas such as the nucleus accumbens and prefrontal cortex) by naturally rewarding experiences such as food, sex, or alcohol.
- Dopamine is more associated with anticipatory desire and motivation ("wanting")
- These dopamine pathways are pathologically altered in addicted persons
The incentive phase
The consumatory phase

**Consummatory pleasure** (commonly referred to as "liking")

- In the contemporary view, the trend is to acknowledge the possibility that the hypothalamus creates peptides in the brain that equal and/or exceed the effect of externally applied chemicals (alcohol, nicotine etc.) when addictive activities take place.

- When an addict is satisfying his craving, endorphins are produced and released within the brain, reinforcing the individual's positive associations with their behavior.
The consumatory phase
Etiology

The biochemical factors:

Alcohol is metabolized by two enzymes:

- **alcohol dehydrogenase** (ADH) - catalyses the conversion of alcohol into acetaldehyde which is the toxic compound,

- **aldehyde dehydrogenase** - catalyses the conversion acetaldehyde into acetic acid.

  aldehyde dehydrogenase is inhibited by disulfiram (Antabuse)
EFFECTS OF ALCOHOL
DIAGNOSTIC CRITERIA FOR ALCOHOL INTOXICATION (DSM IV)

A. recent ingestion of alcohol

B. clinically significant maladaptive behavior or psychological changes (e.g. inappropriate sexual or aggressive behavior, mood liability, impaired judgment, impaired social or occupational functioning) that develop during or shortly after alcohol ingestion

C. one or more of following signs developing during or shortly after alcohol ingestion:
   - (1) slurred speech
   - (2) in-coordination
   - (3) unsteady gait
   - (4) nystagmus
   - (5) impairment in attention or memory
   - (6) stupor or coma

The symptoms are not due to a general medical condition and not better accounted for by other mental disorder.
Clinical symptoms of acute intoxication

<table>
<thead>
<tr>
<th>Concentration of ethanol (promille):</th>
<th>The disorganised function of the central nervous system:</th>
<th>The effects of an ethanol action:</th>
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</thead>
<tbody>
<tr>
<td>0,2 - 0,5</td>
<td>Self-criticism</td>
<td>Handicap higher acts of brain, improvement of frame of mind, carelessness, diminution of moral brakes, diminution of criticism, decrease of cognitive functions</td>
</tr>
<tr>
<td>0,5 - 1,5</td>
<td>Intellect</td>
<td>Sensorial, emotional, motorial control</td>
</tr>
<tr>
<td>1,5 - 3,0</td>
<td>Sensorial, emotional, motorial control</td>
<td>Shaky walk, mumbling speech, considerable diminution of motorial efficiency, lack of emotional self-control</td>
</tr>
<tr>
<td>3 - 5</td>
<td>Consciousness, orientation</td>
<td>Sopor, stupor</td>
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<tr>
<td>&gt; 5</td>
<td></td>
<td>Alcohol coma</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Death</td>
</tr>
</tbody>
</table>
The treatment of the acute intoxication

- Estimation of the patient state
- Drug treatment as a help only
  No benzodiazepins!
  No neuroleptics!
- Vitamines (B1, B12, acidum folicum)
- 1-2 l 0.9 % NaCl and 10 % glucose + 15 u. insulin + 100-200 mg tiamine - to improve alcohol metabolism
- In stupor or coma a routine treatment is practiced (as with other substances working depressively on the central nervous system).
Alcohol withdrawal ("the shakes")

A. Cessation of (or reduction in) alcohol use that has been heavy and prolonged

B. Symptoms developing within several hours to a few days:
   - autonomic hyperactivity
   - tachycardia or hypertension
   - tremulousness (trembling of a tongue, eye-lids, and hands)
   - diaphoresis
   - sweating
   - nausea or vomiting
   - insomnia
   - irritability
   - anxiety
   - psychomotor agitation
   - headaches
   - orthostatic hypotension
   - malaise or weakness
   - transitory hallucinations or illusions
   - grand mal seizures
COMPLICATIONS

- **Tremulousness** (commonly called shakes, jitters) develops 6 - 8 h after the cessation of drinking.
- **Psychotic and perceptual symptoms** begin in 8 - 12 h.
- **Seizures** in 12 - 24 h.
- **DT** - during 72 h or first week of withdrawal (symptoms usually develop on the third day after withdrawal).
Delirium Tremens

- In addition to symptoms of delirium (consciousness disturbances) the symptoms of alcohol withdrawal delirium include autonomic hyperactivity, tachycardia, fever, insomnia, anxiety and hypertension, perceptual distortions, visual or tactile hallucinations (formication), fluctuating motor activity (from hyperexcitability to lethargy).

- Is a medical emergency (mortality rate of 20%).

- Patients with DT are dangerous to themselves and to others.

- Unpredictable behavior - may act on hallucinations or delusional thoughts.
Treatment of DT

- Benzodiazepines
  - to prevent: 25-50 mg every 2-4
  - to treat DT: 50-100mg every 4

- Physically restraining is risky - they may fight to a complete exhaustion

- Dehydration caused by diaphoresis and fever can be corrected with fluids given by mouth or intravenously

- Antipsychotic medication should be avoided (may decrease the seizures threshold)
Cause of death in DT:

• intercurrent somatic diseases, like pneumonia, hepatic insufficiency, heart failure,
• unpredictability of suicidal behavior,
• fever, dehydration ect.
Alcohol withdrawal and detoxification

- Withdrawal from large amounts can cause mild to life threatening symptoms lasting for days to weeks.

- Requires medical monitoring and treatment with medication to prevent seizures and delirium tremens.
The treatment of withdrawal syndromes

- Exact patient’s examination
- Estimation of biochemical parameters
- Check of life parameters (every 6 hours) and continuous observation as well
- Supplementation of electrolyte disturbances, irrigating, treatment of comorbid disorders
- BZD administration (diazepam, lorazepam). In case of severe anxiety or psychotic symptoms haloperidol is used
- Vitamins: tiamine, nicotinic acid
- Magnesium Sulphate might be administrated as well
# Long term effects of alcohol

## Medical
- Polyneuropathy
- Cardiomiopathy
- Hypertension
- Skeletal muscle damage of uncertain clinical significance
- Gastritis, peptic ulcer
- Constipation
- Pancreatitis
- Cirrhosis
- Impotence
- Various anemia
- Accidents

## Mental disorders
- Depressed or anxious mood, especially during withdrawal
- Decreased appetite, poor sleep, body aches, suicide attempts
- Disinhibited behavior
- Alcohol induced mental disorders
Complications of alcoholism - physical complications

**LIVER:**
- The major adverse effect of alcohol use are related to liver damage.
- Heavy drinking can result in an accumulation of fats and proteins leading to **fatty liver**.
- Alcohol use is associated with developing alcoholic **hepatitis** and **hepatic cirrhosis**.
- **Hepatic encephalopathy** - hepatic dysfunctions cause changes in intellectual and emotional processes as well as in psychomotor and behavioral regulation.

**GASTROINTESTINAL SYSTEM:**
- Alcohol abuse inhibit intestine’s capacity to absorb various nutrients such as vitamins and amino acids. This effect coupled with the often poor dietary habits can cause serious **vitamin deficiencies**, particularly of the **B-group** vitamins.
Alcohol induced persisting dementia

- A result of Cerebral atrophy

It is difficult to separate the toxic effects of alcohol abuse from the **CNS damage**, done by poor nutrition, or malfunctioning of such organs like liver, pancreas, kidneys,
Alcohol induced persisting amnestic disorder

Wernicke - Korsakoff Syndrome

**Wernicke's encephalopathy**

- A set of acute symptoms, completely reversible with treatment;
- Characterized by: ataxia (specially the gait), vestibular dysfunction, confusion, ocular motility (horizontal nystagmus, gaze palsy, sluggish reaction to light).
- May clear spontaneously in a few days or weeks or may progress into Korsakoff's syndrome.

**Korsakoff's syndrome**

- Chronic amnestic syndrome that can follow the Wernicke's encephalopathy.
- Features: impaired recent memory and anterograde amnesia in alert and responsive patient.
- Confabulation may occur or not.

Both caused by thiamine deficiency

**Treatment:** large doses of thiamine
Alcohol induced persisting amnestic disorder, c.d.

Alcoholic pellagra encephalopathy

Nicotinic acid (niacin, vitamin B3) deficiency encephalopathy

A patient, who seems to suffer from Wernicke-Korsakoff’s syndrome but do not respond to thiamine treatment.

Symptoms: confusion, clouding of consciousness, myoclonus, fatigue, apathy, irritability, anorexia, insomnia, sometimes delirium.
Alcohol induced psychotic disorder (with delusions)

- Usually in chronic alcohol abuse.
- Most common hallucinations are auditory, usually voices, but often unstructured.
- Voices are maligning, reproachful, threatening, sometimes pleasant.
- Impaired reality testing is common.
- Often last less then one week. After the episode most patients realized the hallucinatory nature of those symptoms.
- Differentiation criteria: the temporal association with alcohol withdrawal, short time duration and absence of history of schizophrenia; presence of the clear sensorium differs from DT.

Treatment: benzodiazepines, good nutrition and fluids. In long term cases antipsychotic drugs may be used.
Other alcohol induced disorders:

- Alcohol induced mood disorder
  With manic, depressive or mixed features - onset during either intoxication or withdrawal

- Alcohol induced anxiety disorder
  Generalized anxiety, panic attacks, obsessive-compulsive disorder.
  (may be difficult to decide whether the anxiety symptoms are secondary or primary)

- Alcohol induced sleep disorder
- Alcohol induced sexual dysfunction
Fetal alcohol syndrome (FAS)

Occurs when a fetus is exposed to alcohol due to its mother's drinking.

- mental retardation,
- inhibited growth and postnatal development
- microcephaly,
- facial malformations,
- limbs and heart defects
- maladaptive behavior in adults
Complications of alcoholism

**Health and psychiatric complications**

- Suicide
- Depression
- Hallucinosis
- Dementia
- Othello’s syndrome
- Delirium tremens

**Social complications**

- Alcoholic’s families problems
- Unemployment
- Crimes
  - Functional problems
    - Relationships
    - Work
    - Money
    - Housing
    - Legal
Why do people drink and why do they abuse?
Common consequences of use

Positive
- Friendships
- Sense of belonging to a group
- Facilitation of intimacy/sex
- Relief from distress
- Pleasure and enjoyment
- Reduction of craving or withdrawal symptoms

Negative
- Relapse of symptoms
- Interpersonal conflicts
- Financial problems
- Health
- Housing problems
- Legal problems
- Institutionalization
  - Hospital
  - Jail
Three patterns of chronic alcohol abuse

- Regular daily excessive drinking
- Regular heavy drinking on weekends only
- Long periods of sobriety interspersed with binges that last days, weeks, or months
Phases of alcoholism

1. Social drinking
2. Warning phase
3. Phase of symptoms
4. Chronic phase
History of alcohol dependence

1. Beginning of alcohol use and warning symptoms
   
   a. the first contact with alcohol
   b. the first intoxication
   c. the first deep intoxication

   - symptoms of physical intolerance, e.g. vomiting
   - better feeling, relaxation after alcohol intake
   - social disapproval connected with alcohol abuse
   - increase of alcohol tolerance
History of alcohol dependence

2. **Problem drinking (phase of symptoms)**
   a. alcohol intakes lasting longer than one day
   b. aggressive behavior after alcohol intake
   c. social pressure towards abstinence
   d. beginning of law problems
   e. withdrawal symptoms
   f. lonely alcohol intake
   g. feeling of alcohol abuse
   h. absence at work
   i. troubles with employment
   j. inability to decrease and discontinue drinking
History of alcohol dependence

3. Attempts to control drinking

a. trying to decrease amount of alcohol

b. drug self-administration to improve the medical condition

c. Disulfiram, Esperal

d. feeling of alcohol dependence
History of alcohol dependence

4. Chronic phase

a. decrease of alcohol tolerance

b. anxiety, fear, distress

c. body trembling

d. the first visit at a psychiatrist

e. aversive drugs intake

f. dysfunctions of CNS or other physical complications

g. the first hospitalization

h. the first alcohol psychosis (delirium, hallucinosis)
assessment questions

- When do you usually drink?
- Who do you drink with? Where? When?
- What makes you feel like having a ___?
- What is it like when you drink? How do you feel? What do you do?
- What do you enjoy about drinking?
- What are the down sides of drinking for you?
- What do other people think/say about your drinking?
Common cues

- Internal
  - Thoughts
  - Emotions
  - Craving

- External
  - People
  - Places
  - Activities
THERAPY
• confrontation of denial
• insistence of abstinence
• assessment of motivation
• pharmacotherapy: Disulfiram, Naltrexone, Acamprosate
• involvement of family
• Alcoholics Anonymous
• Cognitive-behavioral therapy
Dependence treatment

Modern programs of addiction psychotherapy are based on the Minnesota program

- Engagement
  - Outreach, practical help, crisis intervention, develop alliance, assessment
- Persuasion
  - Education, set goals, build awareness of problem (motivational counseling), practical skills training, family support, peer support
- Active Treatment
  - Substance abuse counseling, medication treatments, skills training, self help, groups, family
- Relapse prevention
  - Relapse prevention plan, continue skills building in active treatment, expand recovery to other areas of life

Different services are helpful at different stages of treatment
Groups of support

**AA** - is a voluntary supportive fellowship of persons with alcohol related disorder

- AA is part of multiple-treatment approach.
- Members make a public admission of their alcohol related disorder and abstinence is the rule.
- Was founded in 1935 by two alcohol addicts: a stockbroker and a surgeon.

**Al-Anon** is an organization of spouse of people with alcohol related disorders and is structured along the same lines as AA.

- Helps the spouse to regain the self-esteem.
- To refrain from feeling responsible for a spouse drinking.
- To develop rewarding life for themselves and their families.