

# *Psychological Correlates of Arterial Hypertension*

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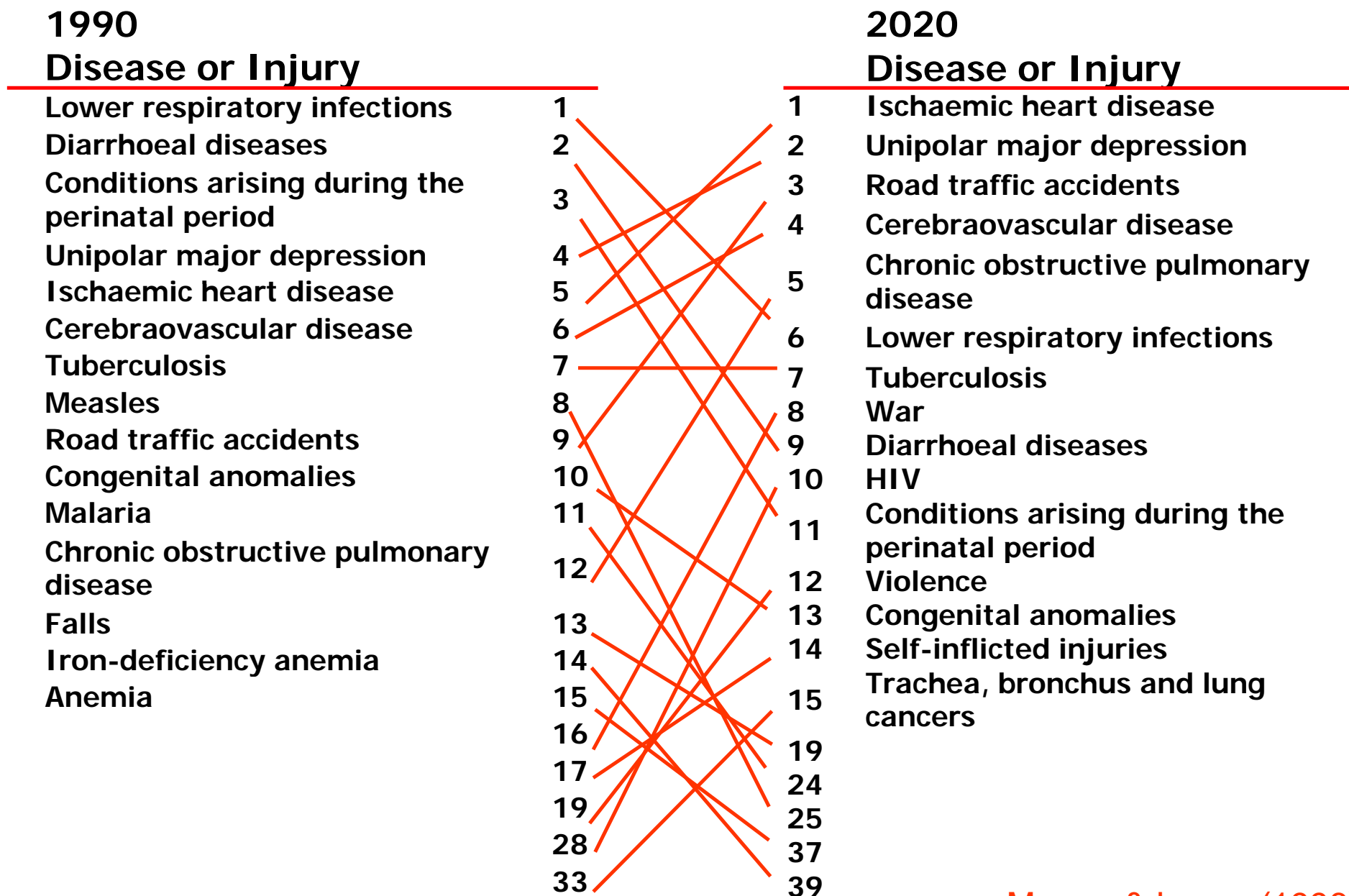
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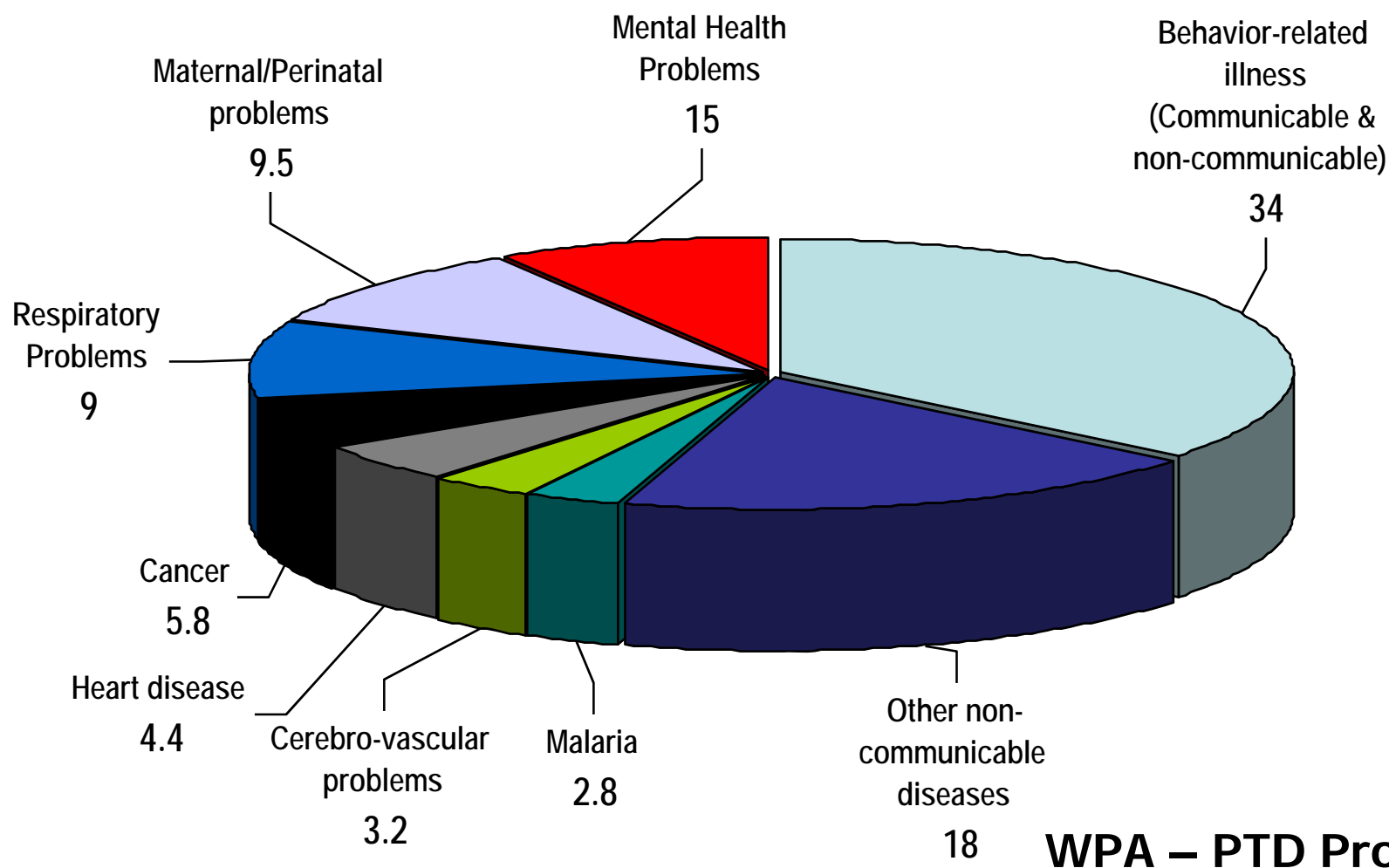
# Change in rank order of DALYs for the 15 leading causes, world, 1990 - 2020

## World Health Report 1999

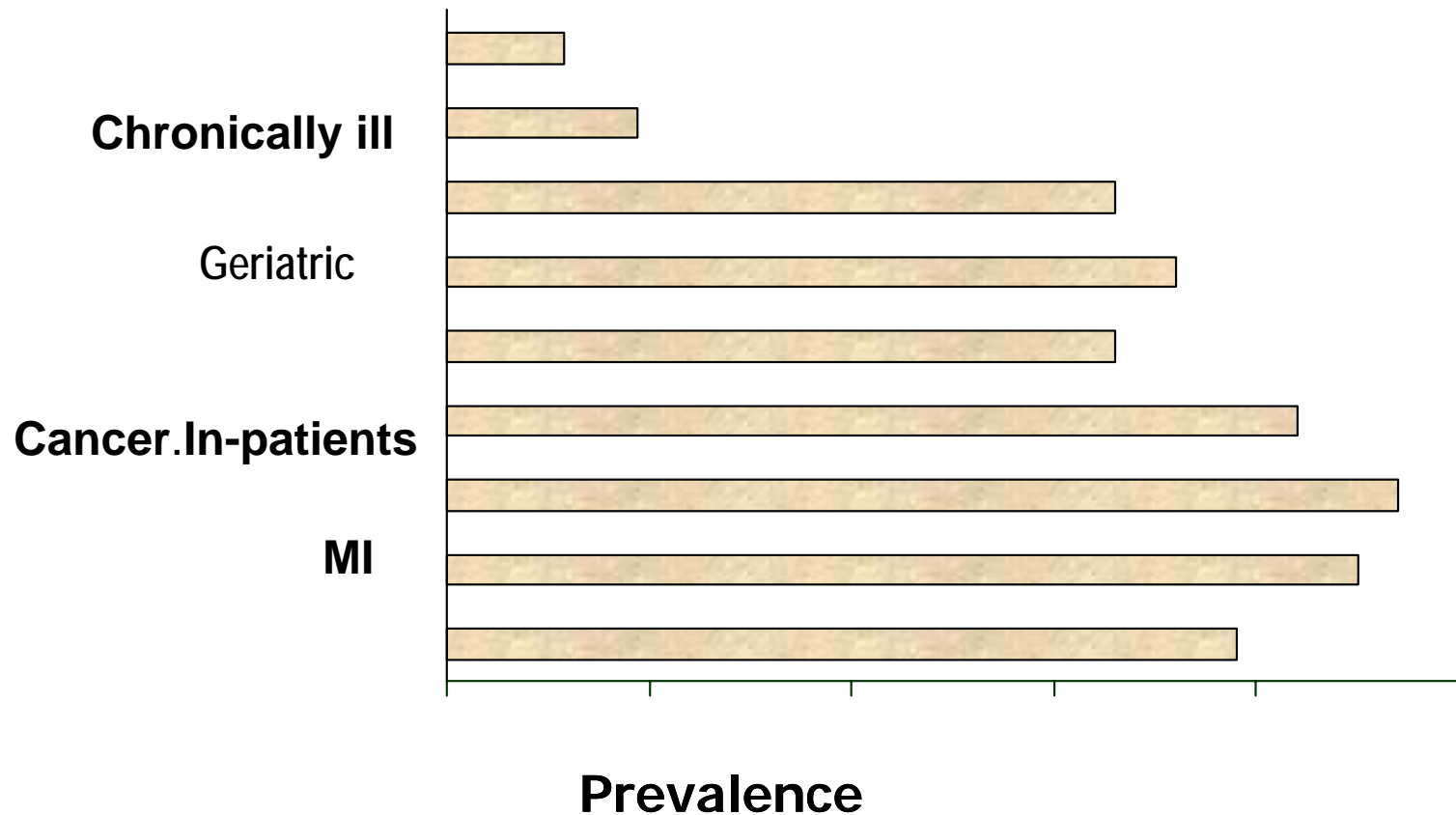


Murray & Lopez (1996)

# Global Distribution of Health Burdens (1999) Percentage of Disability-adjusted Life Years Lost



# Prevalence of Depressive Disorders in Different Patient Populations\*



\*There is a range of percentages depending on the study.

WPA – PTD Program

# Heart and Emotions

- Cardiac disease has a reciprocal relation with emotional distress, psychosocial state, and psychiatric pathology.

- A panic attack may present as chest discomfort , and cardiac ischemia can mimic acute anxiety.

# Limbic System and Endocrines

- Limbic-hypothalamic emotional-behavioral responses, triggered by the sympathoadrenal and other neuroendocrine systems, affect cardiac illness.

# Stress and Arrhythmias

- Both the brain and the peripheral sympathetic nervous system are implicated as causes of stress induced arrhythmias.



Cont..

- Stressors—from mental arithmetic to the more potent interview discussing illness and death were much more reliable inducers of arrhythmias than physical maneuver such as carotid sinus massage, posture changes on a tilt table, the Valsalva maneuver, hyperventilation, breath holding, and dive reflex activation

# Psychosocial Factors and BP

- Given the effects of norepinephrine and epinephrine on the myocardium and on peripheral vascular resistance it is not surprising that psychosocial factors correlate with transient and sustained blood pressure elevation.

# Urban and Rural Societies

- Rural societies have fewer hypertensive individuals than do urban societies with their higher crime rate and unstable social structures .

# Vasoconstrictive Response

- Some hypertensive patients, for instance, have a more prolonged vasoconstrictive response to psychological stress than normotensive patients.
- Similar responses in normotensive offspring of hypertensive parents suggest genetic transmission of a vulnerability in stress responsiveness.

# Personality Vulnerability to HT and CAD

- Compulsively working long hours without taking vacations.
- Without delegating responsibility.
- Without taking care of his or her health , and without acknowledging a tendency to depression.

# Inner Anger

- The tendency to experience internal anger while controlling its expression was another cornerstone in the psychoanalytic understanding of patients with CAD.

# Time Urgency

**To determine the presence of time urgency, you may ask the following questions:**

1. Do you eat fast and leave the dinner table immediately ?
2. Does your partner or any close friend tell you to slow down, become less tense, or take it easy?
3. Does it bother you a lot to wait in line at a cashier's counter or to be seated in a restaurant?

Cont..

4. Do you usually look at TV or read the paper while eating?
5. Do you examine your mail or do other things while listening to someone on the telephone?
6. Do you often think of other matters while listening to your partners or others?
7. Do you believe that usually you are in a hurry to get things done?



# Free Floating Anxiety

**To determine free floating anxiety, you may ask the following questions:**

1. Do you often find it difficult to fall asleep or difficult to stay asleep because you are upset about something a person has done?
2. Do you believe that most people are not honest or are not willing to help others?
3. Do you become irritated when driving or swear at others?

Cont..

4. Does your partner, when riding with you, ever tell you to cool or calm down?
5. Do you often have a feeling that your partner is competing against you or is too critical of your inadequacies?
6. Do you grind your teeth or has your dentist ever told you that you have done so?
7. Does the car-driving errors of other drivers, the indifference of store clerks, or the tardiness of mail delivery upset you significantly?

# Type “A” Behaviour “Time Urgency” or “Hurry Sickness”

- There are two cardinal features of type A that we must remember, namely, "time urgency or time-impatience" and "free-floating anxiety", (all pervasive and ever-present).

# Type A

- The relationship between type A personality and heart disease has become common knowledge, at least, among physicians and their afflicted patients.
- In spite of its wide publicity and media attention, criteria of type A behavior or personality still remain vague.

## **a) Hates Delays:**

- Rage at having to wait in line.
- Detests wasting time.
- Drives over the speed limit.

## **b) Hostility**

- Competitive, 'must win,' reluctant to share power/control/delegate, takes on more and more work.

## **C) Self-destructive Tendencies:**

- over-working
- low levels of exercise
- smoking
- works during vacations
- guilt over relaxing
- always works more than eight hours a day

## **d) Cognitive:**

- Perfectionistic.

## **e) Affective:**

- Negative, Cynical, Critical, Ruthless in self-reproach.

## **f) Workaholic:**

- Lives by deadlines and quotas.
- Creates unnecessary deadlines.

## The Six Physical Signs are:

1. Excessive perspiration of the forehead and the upper lip.
2. Teeth grinding.
3. Indentation of the tongue due to its chronic pressure against the top incisor teeth.
4. Tic-like retraction of the upper eye lid.
5. Tic-like retraction of the corners of the mouth.
6. Brown coloring of the skin of the lower eyelid.



## Type B

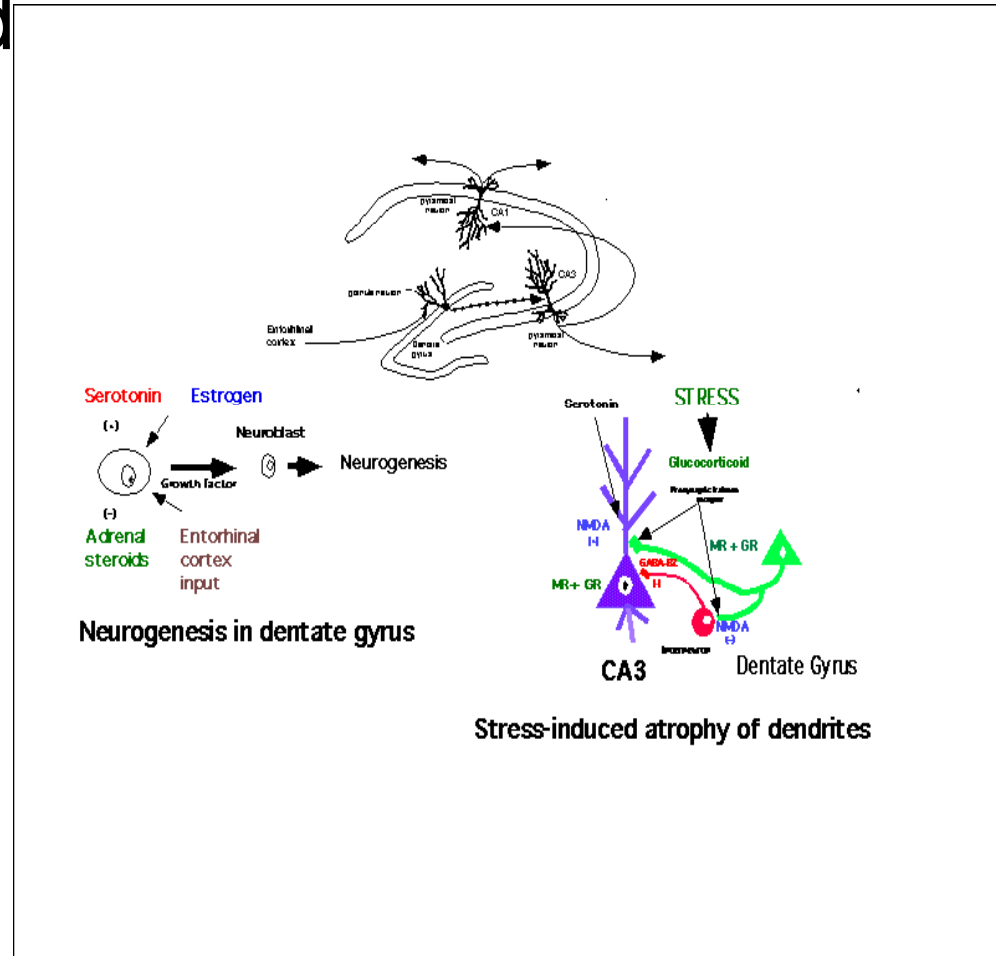
- Relaxes readily.
- Focuses on the quality of their life.
- Easygoing "one day at a time".
- Less ambitious.
- Lower incomes/grades
- Less irritable

# Type D

- Negative affectivity and social inhibition are broad and stable personality traits that may be of special interest not only in CHD, but in other chronic medical conditions as well.

# Repeated Restraint Stress

- Dendrites remodeled
- Neurogenesis inhibited.
- Memory impaired.
- Fear increased - open field; fear conditioning
- Aggression increased
- HPA habituation



# Psychosocial Intervention

- Social interaction leads to neurogenesis and proliferation of dendrites in cells of the hippocampus and increased dopamine in the dopaminergic reward pathways.
- Lack of social interaction leads to the opposite, hopelessness and helplessness.

# **Stress, Cardiovascular Disease and Depression**

**Stress may produce:**

**anxiety – depression – hostility –  
unexpressed anger - cynicism – mistrust**

# Acute stress → activation of sympathetic system →:

1. Reduction of vagal tone which is protective for the heart
2. Endothelial function is impaired → injured → thrombosis
3. Platelets more hyper-coagulable, more sticky, increases platelet aggregation and adhesion.
4. Haemoconcentration → increased blood viscosity

# Chronic Stress

1. Platelets
2. Endothelium
3. Vagal tone
4. Activating cortisol system
5. Ovarian dysfunction, oestrogen is probably very protective → it raises HDL

# Myocardial Infarction

After an episode of major depression, the risk of myocardial infarction increased four to fivefold.

Subsyndromal forms of depression had a twofold increased risk of myocardial infarction.



- 6 months after MI:  
Mortality rate : 17% in patients with depression,  
3% without . (Frasure-Smith et al 1993)
- 12 months after bypass:  
Those with depression : a higher incidence of  
subsequent cardiac events, angina, heart  
failure, MI, repeat surgery. (Connerney 2000)
- Major depression is a significant risk factor for  
the development of coronary artery disease and  
stroke

- “Social Capital” is defined as the ties that bind families, neighborhoods , workplaces, communities, and religious, groups together and find that it correlates strongly with subjective wellbeing.
- In fact the breadth and depth of an individuals' social connections are the best predictors of their happiness.

# Depression and Cardiac Disease

- According to a large meta-analysis, the prevalence of major depression in patients with CHF is more than 20%.
- Etiological factors include individual environment (eg. genetic disposition and social environment) as well as psychosocial stress and biological risk factors related to the chronic cardiac illness.

Cont..

- Possible mechanisms mediating this relationship include both biological (eg. severity of chronic heart failure, autonomic and immunological irregularity, multiple comorbidities) and behavioral factors (eg. health behavior, compliance with pharmacological and non-pharmacological therapy)
- Important mediators of atherosclerosis that have been characterized in recent years include endothelial dysfunction, inflammation, and a spectrum of hematologic and metabolic abnormalities.

# HPA and CRF

- Gillespie and Nemeroff note that common elevation of corticotrophin-releasing factor (CRF) occurs in the cerebrospinal fluid of depressed individuals.
- This stimulation leads to hyperactivity of the hypothalamic pituitary-adrenal (HPA) axis. high plasma cortisol levels, blunting of the adrenocorticotrophic hormone (ACTH) response to CRF infusion, dexamethasone nonsuppression. and adrenal hypertrophy.

# Norepinephrine and Platelet

- Depression is associated with stimulation of the sympathetic nervous system. Followed by elevated levels of circulating plasma norepinephrine levels. with resultant dysfunction of the autonomic nervous system.
- Depression is also associated with complex platelet abnormalities such as increased concentrations of functional glycoprotein receptors and hyperactivity of the (5-HT) transporter 2A receptor signal transduction system.

# Immune Abnormalities

- The relationship between depression and a range of immune abnormalities, including increased production of cytokines and C-reactive protein.
- The potential bidirectional relationship that may exist between depression and atherosclerosis, indicating an increase in depressive symptoms after the experimental administration of tumor necrosis factor (TNF).
- This inappropriate behavior also includes smoking, physical inactivity, and poor diets, thereby indirectly increasing the likelihood of recurrent cardiac events and premature death.

# Mental Illnesses and Physical Morbidity

- People with severe mental illnesses (SMI), such as schizophrenia, have a reduced life expectancy compared to the general population. They have a 2-3 fold increased risk of dying.
- People with severe mental illness have nearly twice the normal risk of dying from cardiovascular disease.
- The causes of MetS are not fully understood, but there is a central role of visceral adiposity and insulin resistance.



Estimated prevalence and relative risk (RR) of modifiable cardiovascular disease risk factors in schizophrenia and bipolar disorder compared to the general population

<b>Estimated prevalence, % (RR)</b>		
<b>Modifiable risk factors</b>	<b>Schizophrenia</b>	<b>Bipolar disorder</b>
Obesity	45-55	21-49 (1-2)
Smoking	50-80	54-68 (2-3)
Diabetes	10-15 (2)	8-17 (1.5-2)
Hypertension	19-58 (2-3)	35-61 (2-3)
Dyslipidaemia	25-69 ( $\leq 5$ )	23-38 ( $\leq 3$ )
Metabolic syndrome	37-63 (2-3)	30-49 (1.5-2)

# GET HAPPY ... IT IS GOOD FOR YOU

- Embark on a loving relationship with another adult, and work hard to sustain it.
- Plan frequent interactions with friends, family, and neighbours (in that order).
- Make sure you're not working so hard that you've no time left for personal relationships, and leisure.

- In your spare time, join a club, volunteer for community service or augment your religious heritage.
- Happiness should become the goal of public policy and the progress of national happiness should be measured and analysed as closely as the growth of gross national product.
- This means that public policy should be judged by how it increases human happiness and reduces human misery

# Make Your Choice

- Be successful, competitive, workaholic and die younger.

or

- Be less ambitious with lower income, more relaxed and live longer.