Psychiatric disorders and Heart Disease

“ For every affection of the mind that is attended with either pain or pleasure, hope or fear, is the cause of an agitation whose influence extends to the heart, and there induces change from the natural constitution,in the temperature, the pulse and the rest”

- Dr William Harvey, 1962

BOX 34-1 Psychosocial Factors That Have Been Linked to the Progression or Prevention of Cardiovascular Disease

Negative Thought Patterns and Emotions

Depressive syndromes
- Mild to moderate depressive symptoms
- Major depression
- Hopelessness

Anxiety syndromes
- Generalized anxiety disorder
- Phobic anxiety
- Panic disorder
- Post-traumatic stress disorder

Hostility and anger

Worry

Pessimism

Chronic Stress

Work stress

Marital stress and dissatisfaction

Social isolation and lack of social support

Low socioeconomic status

Caregiver strain

Adverse childhood experience

Perceived injustice

Positive Psychological Factors

Positive emotions

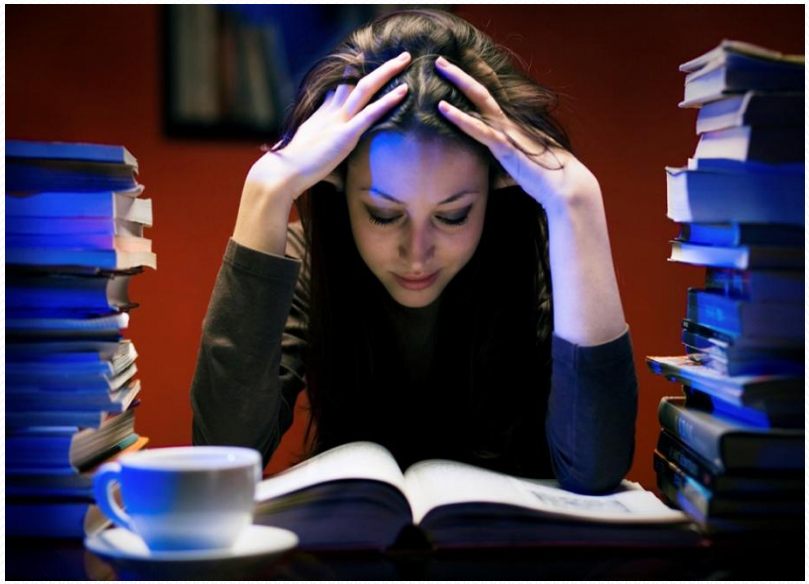
Optimism

Social support

Sense of purpose

Source: Rozanski A, Chap 34, Preventive Cardiology, Blumenthal, Foody, Wong, eds.

Stress, what is it?



- Stress is the body's response to a physical, chemical, emotional, or environmental stress.
- Stress reaction includes physiological changes in the body.
- Stress can be short term of long term and the effects are different on the body.

Types of Stress

- Emotional stress is
  - related to our feelings
  - linked to experiences with others
- Physical Stress
  - is related to physical exertion
  - can be healthy

Anxiety and CHD

- Anxiety is characterized by heightened levels of perceived fear and nervousness– may include panic disorder, social phobia, obsessive-compulsive disorder, acute stress disorder, posttraumatic stress disorder.
- Ventricular arrhythmia may be the underlying mechanism. Anxious individuals also have reduced heart rate variability.
- Some population surveys show prevalence to be approximately 20%

Post Traumatic Stress Disorder (PTSD)

- Present if after exposure of an inciting traumatic event the subject report re-experiencing the event, hyperarousal, and avoidance of traumatic reminders and emotional numbing.
- A retrospective study of men who have served in the military shows a stepwise relation between symptoms of PTSD and nonfatal MI and cardiac death (Kubzansky, Gen Psychiat 2007).
- Study of 1059 women shows relation between PTSD and incident CHD (Kubzansky, Health Psychol 2009).
- Boscarino evaluated 4328 men who served in Vietnam war; PTSD associated with more than a two-fold increased risk of subsequent cardiac mortality, independent of depression symptoms (Psychosom Med 2008).

Pessimism and Optimism

- Optimists tend to see negative events as temporary and positive events are more permanent; negative events are attributed to external causes rather than self-condemnation.
- Pessimists have an opposite explanatory style to events.

- In the largest study, the Women's Health Initiative showed among 97,253 women that those who were optimistic had a 30% lower rate of cardiac mortality (Tindle, Circulation 2009)

Personality Constructs: Type A Behavior Pattern

- The Type A behavior pattern includes a hard-driving, time-patient, and hostile behavior.
- Friedman and Rosenman showed the Type A Behavior Pattern to be related to both CAD risk and recurrent MI; however subsequent studies showed no relationship, so this has been of diminished interest.
- The Recurrent Coronary Prevention Project did show intervention from counselling on Type A behavior to reduce recurrent MI rates and cardiac deaths (Friedman et al., Am Heart J 1986)

Hostility

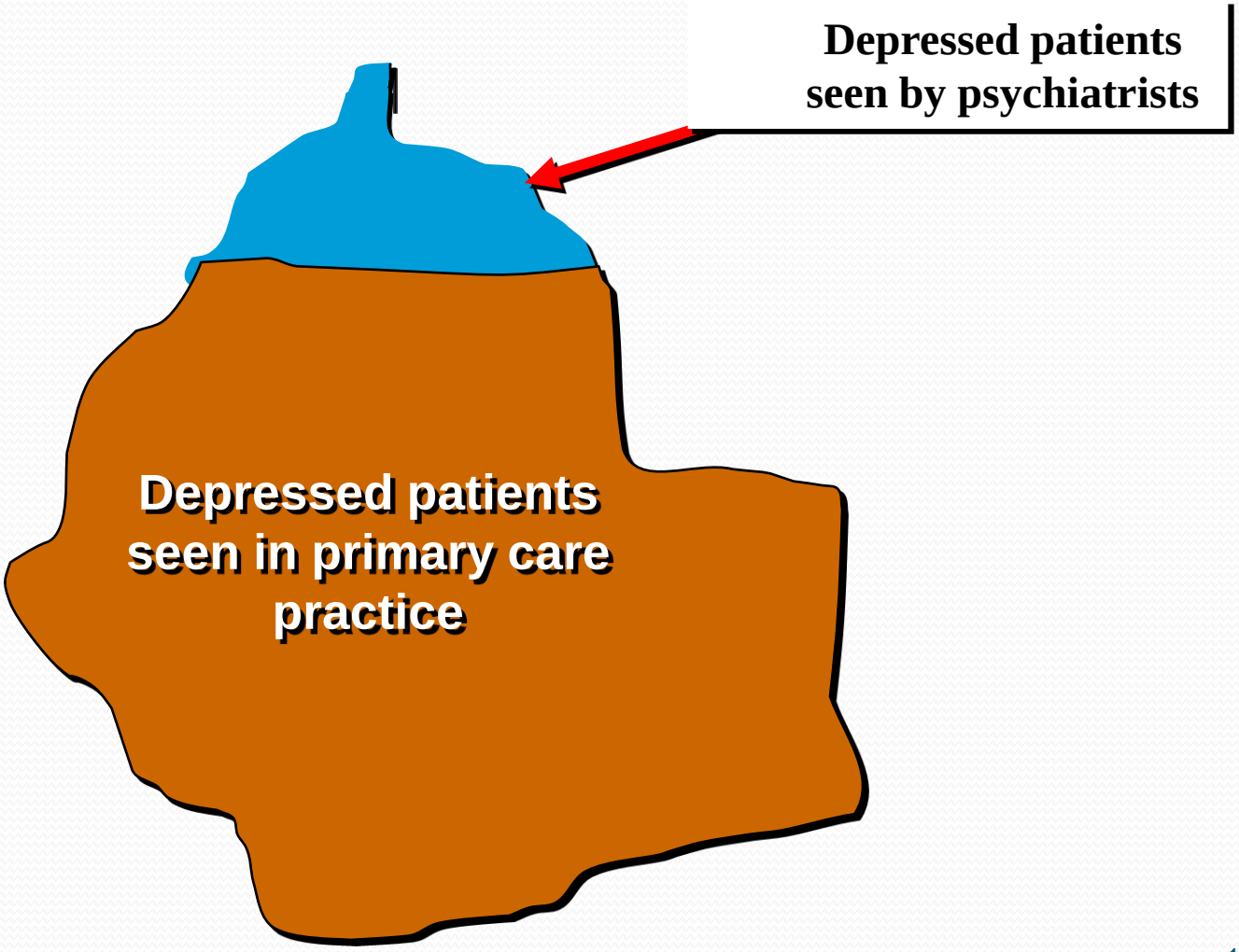
- Reflects emotional (anger, contempt), behavioral (verbal and physical aggression), and cognitive (cynicism, mistrust) factors.
- Predicts incident CHD in healthy individuals, even after risk factor adjustment (Niaura et al.. Health Psychol 2002).
- Hostility is associated with heightened cardiovascular reactivity and higher blood pressure.
- May be a stronger indicator of incident CHD than of recurrent CHD or its progression.

Depression

- Estimated prevalence of major depression is up to 30% in cardiac patients
- Characterized by a depressed mood and combination of other symptoms such as weight change, sleep disturbance, insomnia, fatigue, feelings of guilt, worthlessness, and/or hopelessness.
- Depression can stimulate the autonomic nervous system and HPA axis. It is also proinflammatory and is associated with increases in CRP, fibrinogen, IL-6 and other inflammatory measures, independent of BMI and other risk factors.

- Of all psychosocial factors, evidence of association with CVD is strongest for depression.

"ICEBERG" PHENOMENON



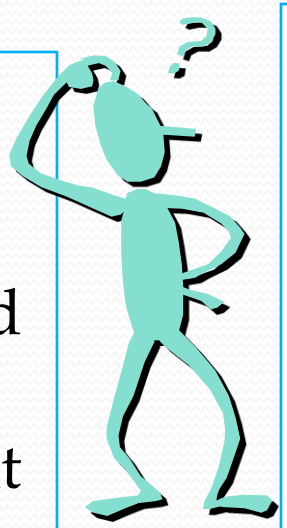
General Medical Disorders and Depression

The Myth & The Reality

MYTH

⇓

Depression is obvious and easily recognized and expressed by the patient



REALITY

⇓

Depressive disorders are overlapping, hardly expressed by the patient and constitute a major problem in *symptom exaggeration*

General Medical Disorders and Depression

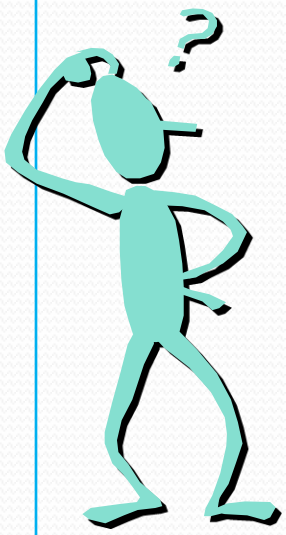
The Myth & The Reality

MYTH

⇓

Depression is Secondary to GMD activity

Treatment of the medical disorder will relieve Depression.

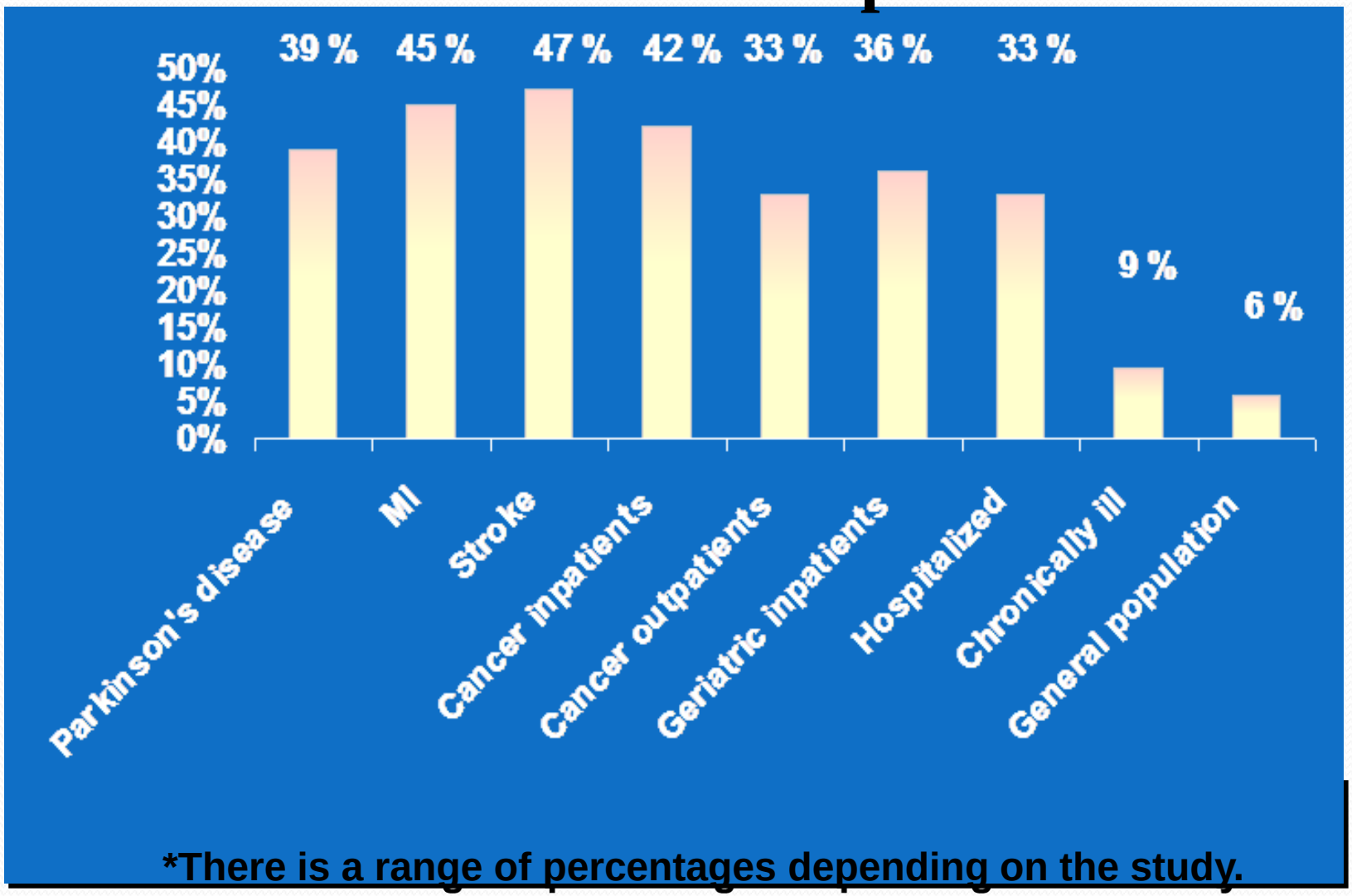


REALITY

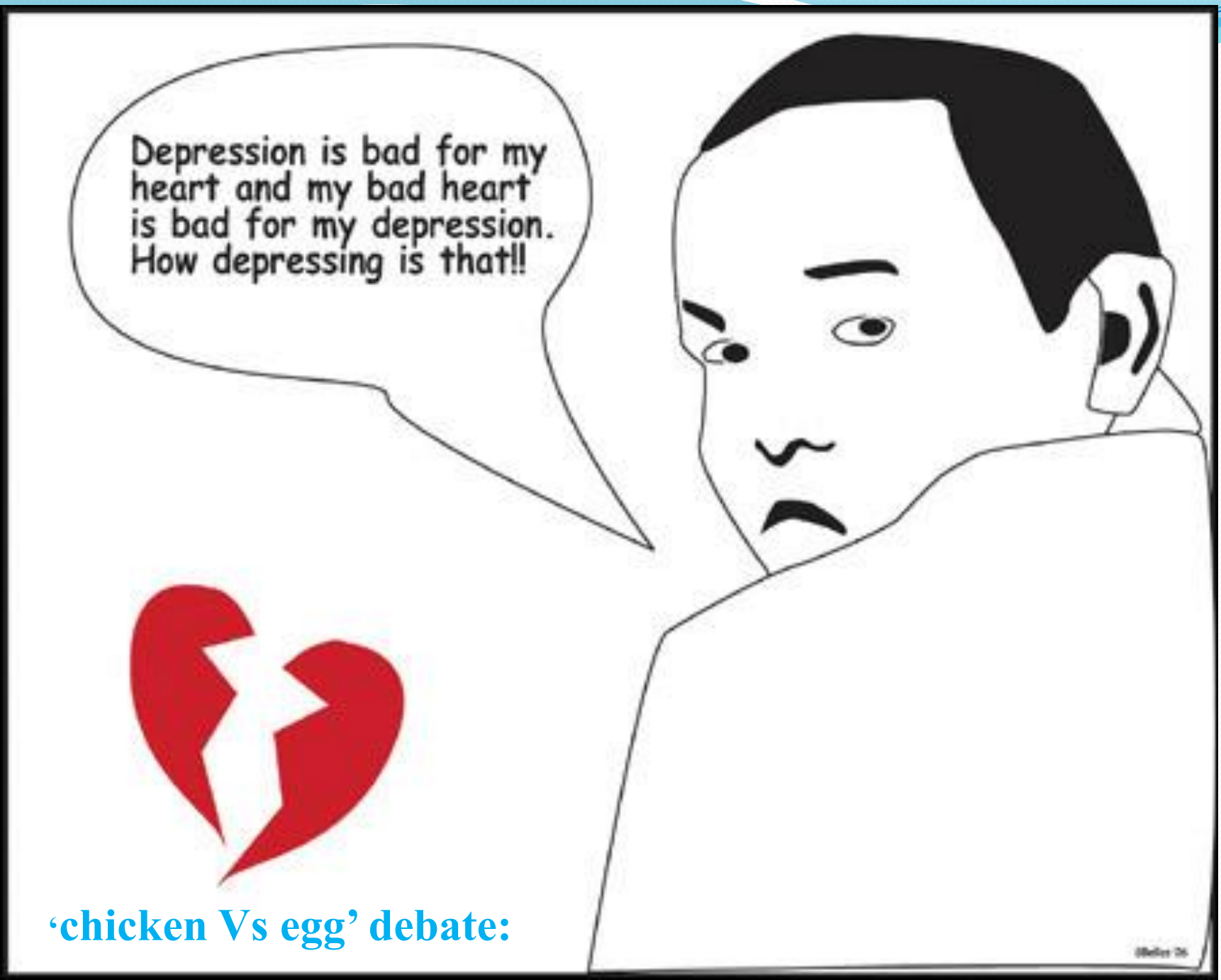
⇓

DEPRESSION REQUIRES TREATMENT intervention and do not remit with relief of symptoms

Prevalence of Depressive Disorders In Different Patient Populations*



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



‘chicken Vs egg’ debate:

Cardiovascular

- Acute cardiovascular disease - 65% report some symptoms of depression
- By diagnosis:
  - CHF 24-42%
  - CABG 20%
  - MI 40%
- Of those diagnosed only about half treated
- 20-30% acute coronary events triggered by emotional states

PLAUSIBLE MECHANISMS

- Autonomic imbalance- Too much sympathetic, too little parasympathetic.
- Exaggerated platelet reactivity, endothelial dysfunction.
- Hypothalamic-pituitary-adrenocortical and sympatheic adrenal medullary activation.
- Polymorphism in the serotonin transport promoter region gene (Otte, 2007)

Many Faces of Depression

Depressive symptoms ⇨ Background

Somatic symptoms ⇨ Foreground

Major Depressive disorder

Pervasive depressed mood / sadness

Loss of interest/ pleasure …. plus

lack of energy, fatigue, poor sleep and appetite, physical slowing or agitation, poor concentration, physical symptoms (aches and pains), thoughts of guilt, irritability and thoughts of suicide

If untreated, depression can last for years.

Often complicated by chronic medical disorders, chronic pain, anxiety, cognitive impairment, grief/ bereavement, substance abuse

QUICK SCREENING FOR DEPRESSION IN PRIMARY CARE

Visual Screening Tool

Ask the patient to point to the face that best represents how she/he has felt in the past 2 weeks.

Two Questions

Over the last two weeks:

1. Have you felt down, depressed, or hopeless? (Mood)

2. Have you felt little interest or pleasure in doing things? (Interest)

Two-Steps for Depression Screening

Step One: Two-Question Depression Screen

- Over the past 2 weeks have you felt down, depressed, or hopeless?
- Over the past 2 weeks have you felt little interest or pleasure in doing things

A "yes" to either question is a positive initial screen for depression…

Step Two: If Screen is Positive…

- Probe deeper, be proactive, engage in conversation about mood and changes in behavior
- 24% - 40% of patients with positive screen receive MDD diagnosis
- Others may have dysthymia, sub syndromal depressive disorders, anxiety, PTSD, substance abuse, panic disorder, or grief disorder

US Preventive Services Task Force. Screening for depression: recommendations and rationale. Ann Intern Med. 2002;136(10):760-764

Simple and Quick:
Patient health Questionnaire-9

•PHQ-9 is designed for self-completion by respondents and is in clinics face-to-face and telephone interviews

•It is cognitively simple, taking only a few minutes to complete.

•Instructions to respondents are included in the questionnaire.

The PHQ-9 Depression Screener is provided at in a variety of languages www.phqscreener.com/

- Including Arabic, Assamese, Chinese (Cantonese, Mandarin), Czech, Dutch, Danish, English, Finnish, French, French Canadian, German, Greek, Gujarati, Hindi, Hebrew, Hungarian, Italian, Malay, Malayalam, Norwegian, Oriya, Polish, Portuguese, Russian, Spanish, Swedish and Telugu

Fold back this page before administering this questionnaire

INSTRUCTIONS FOR USE

for doctor or healthcare professional use only

PHQ-9 QUICK DEPRESSION ASSESSMENT

For initial diagnosis:

1. Patient completes PHQ-9 Quick Depression Assessment on accompanying tear-off pad.
2. If there are at least 4 ✓s in the blue highlighted section (including Questions #1 and #2), consider a depressive disorder. Add score to determine severity.
3. ***Consider Major Depressive Disorder***
   —if there are at least 5 ✓s in the blue highlighted section (one of which corresponds to Question #1 or #2)

   Consider Other Depressive Disorder
   —if there are 2 to 4 ✓s in the blue highlighted section (one of which corresponds to Question #1 or #2)

Note: Since the questionnaire relies on patient self-report, all responses should be verified by the clinician and a definitive diagnosis made on clinical grounds, taking into account how well the patient understood the questionnaire, as well as other relevant information from the patient. Diagnoses of Major Depressive Disorder or Other Depressive Disorder also require impairment of social, occupational, or other important areas of functioning (Question #10) and ruling out normal bereavement, a history of a Manic Episode (Bipolar Disorder), and a physical disorder, medication, or other drug as the biological cause of the depressive symptoms.

To monitor severity over time for newly diagnosed patients or patients in current treatment for depression:

1. Patients may complete questionnaires at baseline and at regular intervals (eg, every 2 weeks) at home and bring them in at their next appointment for scoring or they may complete the questionnaire during each scheduled appointment.
2. Add up ✓s by column. For every ✓: Several days = 1 More than half the days = 2 Nearly every day = 3
3. Add together column scores to get a TOTAL score.
4. Refer to the accompanying PHQ-9 Scoring Card to interpret the TOTAL score.
5. Results may be included in patients' files to assist you in setting up a treatment goal, determining degree of response, as well as guiding treatment intervention.

PHQ-9 SCORING CARD FOR SEVERITY DETERMINATION

for healthcare professional use only

Scoring—add up all checked boxes on PHQ-9

For every ✓: Not at all = 0; Several days = 1;
More than half the days = 2; Nearly every day = 3

Interpretation of Total Score

Total Score	Depression Severity
1-4	Minimal depression
5-9	Mild depression
10-14	Moderate depression
15-19	Moderately severe depression
20-27	Severe depression

PATIENT HEALTH QUESTIONNAIRE (PHQ-9)

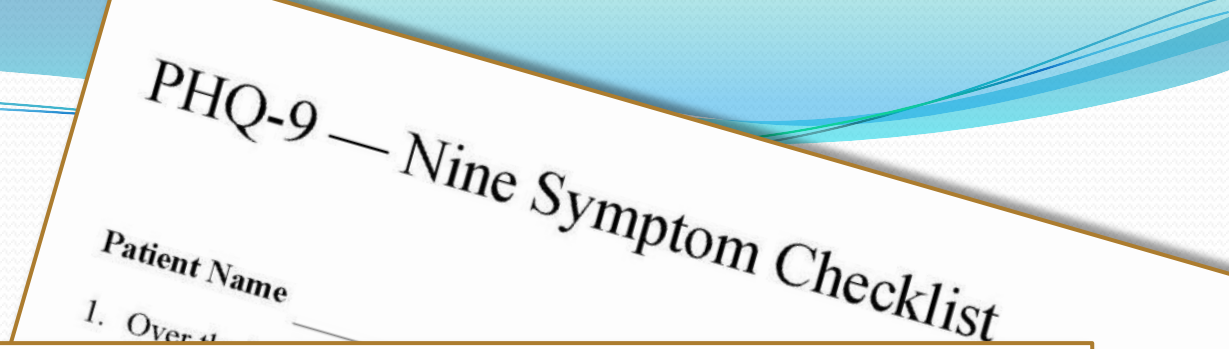
NAME: _____ **DATE:** _____

Over the *last 2* weeks, how often have you been bothered by any of the following problems?
(use "✓" to indicate your answer)

	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself—or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite—being so fidgety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself in some way	0	1	2	3
add columns:		+	+	
(Healthcare professional: For interpretation of TOTAL, please refer to accompanying scoring card) **TOTAL:**				

10. If you checked off *any* problems, how *difficult* have these problems made it for you to do your work, take care of things at home, or get along with other people?	**Not difficult at all** _____ **Somewhat difficult** _____ **Very difficult** _____

PHQ-9



How to Score

Major depressive syndrome is suggested if:

- **Of the 9 items, 5 or more are circled as at least "More than half the days"**
- **Either item 1a or 1b is positive, that is, at least "More than half the days"**

Minor depressive syndrome is suggested if:

- **Of the 9 items, b, c, or d are circled as at least "More than half the days"**
- **Either item 1a or 1b is positive, that is, at least "More than half the days"**

Add all circled answers. For every answer circled:

Not at all = **0**

Several Days = **1**

More than half the days = **2**

Nearly every day = **3**

Total Score	Depression Severity
0-4	None
5-9	Mild
10-14	Moderate
15-19	Moderately Severe
20-27	Severe

Pfizer Inc. Instructions for Use (for doctor or healthcare professional use only): PHQ-9 Quick Depression Assessment.
Available at: http://www.phqscreeners.com/pdfs/PHQ9InstruxforUse.pdf.; The MacArthur Initiative on Depression and Primary Care at Dartmouth and Duke. Depression Management Tool Kit. Hanover, NH: Trustees of Dartmouth College, 2004.

DEPRESSION AND HEART DISEASE

A synopsis based on the WPA volume “Depression and Heart Disease”

(Glassman AH, Maj M, Sartorius N, eds. – Chichester: Wiley, 2010)

Depression as a risk factor for development of coronary heart disease

- Clinical depression is associated with an almost 2-fold higher risk of subsequent coronary heart disease. This association remains significant after adjustment for smoking, alcohol use and coffee consumption (Ford et al., 1998).
- A meta-analysis of 28 studies comprising almost 80,000 subjects found that depression was associated with increased risk of cardiovascular diseases, in particular for acute myocardial infarction (RR = 1.6) (van der Kooy et al., 2003).

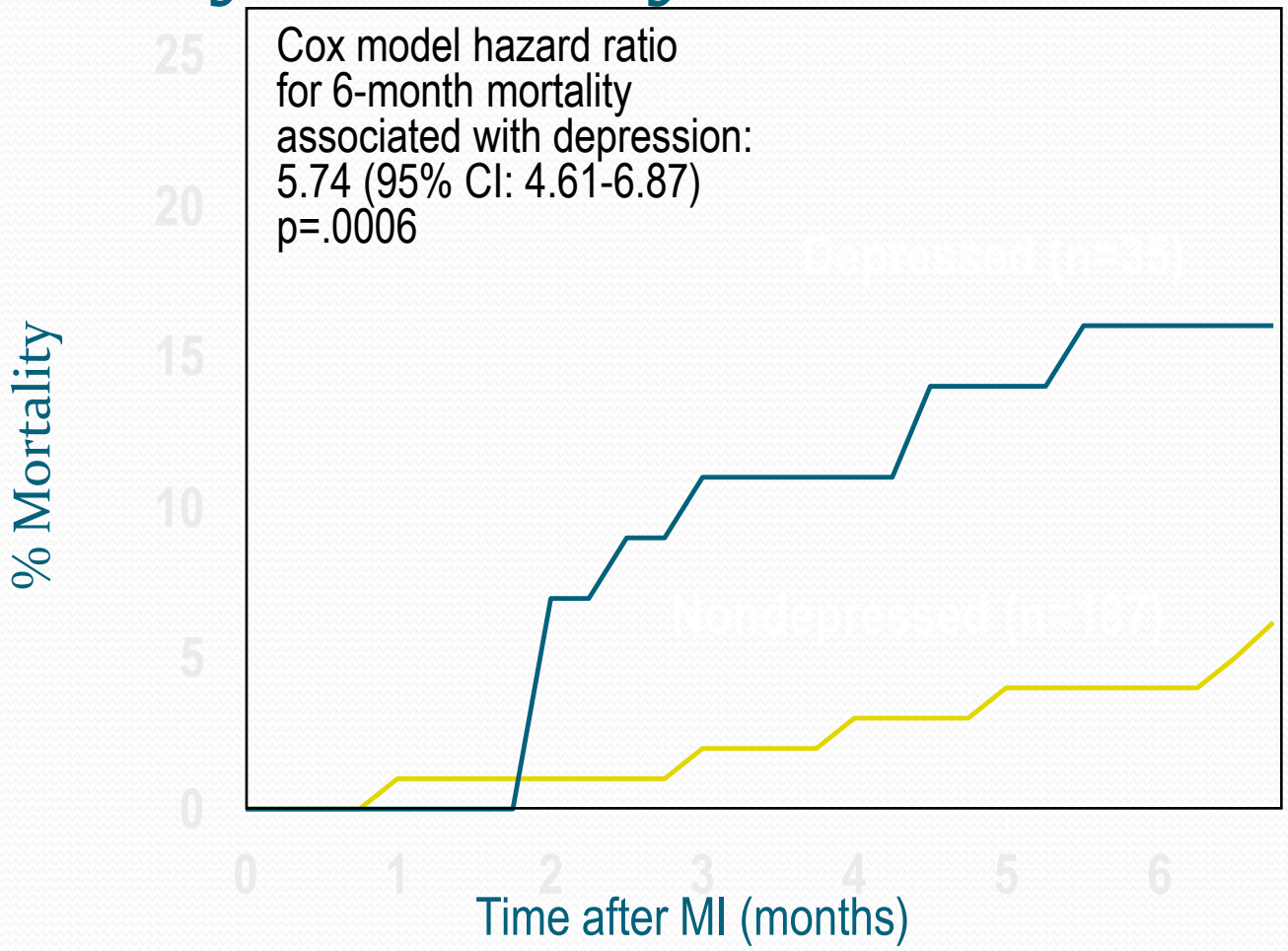
From Jiang W, Xiong GL. Epidemiology of the comorbidity between depression and heart disease. In: Depression and Heart Disease. Glassman AH, Maj M, Sartorius N (eds). Chichester: Wiley, 2010.

Incidence of depression after myocardial infarction

- The incidence of DSM-III major depressive disorder after myocardial infarction has been found to be 16% (Schleifer et al., 1989; Frasure-Smith et al., 1993). Studies based on self-administered questionnaires have reported rates up to 50%.

From Jiang W, Xiong GL. Epidemiology of the comorbidity between depression and heart disease. In: Depression and Heart Disease. Glassman AH, Maj M, Sartorius N (eds). Chichester: Wiley, 2010.

Depression Associated With Increased Mortality Post-Myocardial Infarction



Frasure-Smith N, et al. *JAMA.* 1993;270:1819-1825.

Recommendations for clinicians providing care for patients with comorbid depression and heart disease - I

- *Sleep*. Ask your patients about their sleep habits. Ask about why patients are awakening, and see if changes in treatment or the timing of medications might decrease the need to awaken during the night to pass urine or because of breathlessness.
- *Physical activity*. Strongly encourage your patients to exercise at home and to become involved (and stay involved) in structured exercise programs. Greater involvement in exercise may improve symptoms of depression.
- *Cigarette smoking*. Ask every patient whether he/she smokes, and counsel about smoking cessation if appropriate. Every clinician should become familiar with medications that help patients quit, and should offer specific advice on how to quit and/or set a quit date.

From Ziegelstein RC, Elfrey MK. Behavioural and psychological mechanisms linking depression and heart disease. In: Depression and Heart Disease. Glassman AH, Maj M, Sartorius N (eds). Chichester: Wiley, 2010.

Recommendations for clinicians providing care for patients with comorbid depression and heart disease - II

- *Medication adherence.* Specifically address the issue of medication adherence with every patient and try to decrease barriers to adherence. Simplifying medication regimens, eliminating medications that are not absolutely necessary, and prescribing low-cost alternatives may be helpful in specific circumstances.
- *Attitudes and beliefs about cardiac treatment regimens.* Anticipate the possibility that patients with depression may have greater levels of concern and more negative attitudes and beliefs about medical treatment regimens. Discuss the importance of each medication, what the goals of treatment are, and how the patient's particular health goals are more likely to be achieved by adhering to a particular medical treatment.

From Ziegelstein RC, Elfrey MK. Behavioural and psychological mechanisms linking depression and heart disease. In: Depression and Heart Disease. Glassman AH, Maj M, Sartorius N (eds). Chichester: Wiley, 2010.

Recommendations for clinicians providing care for patients with comorbid depression and heart disease - III

- *Social isolation.* Encourage patients to socialize with family and friends; offer to engage family and friends on behalf of the patient, encourage the patient to participate in group activities that may be appropriate and desirable (sport clubs, hobbies, religious groups).
- *Self-efficacy.* Inquire about your patient's confidence that he/she can accomplish a given task or behaviour (e.g., participation in a cardiac rehabilitation program, stopping smoking, following a proper diet). If the patient's confidence is low, consider specific counseling that might enhance self-efficacy.

From Ziegelstein RC, Elfrey MK. Behavioural and psychological mechanisms linking depression and heart disease. In: Depression and Heart Disease. Glassman AH, Maj M, Sartorius N (eds). Chichester: Wiley, 2010.

Screening for Psychosocial Risk: AHA Science Advisory on Depression (Lichtman J et al. Circulation 2008)

- The recommendations, which are endorsed by the American Psychiatric Association, include:
  - early and repeated screening for depression in heart patients
  - the use of two questions to screen patients – if depression is suspected the remaining questions are asked (9 questions total)
  - coordinated follow-up for both heart disease and depressive symptoms in patients who have both.

AHA Science Advisory on Depression: Other Recommendations

- Evaluation by a professional qualified in diagnosing and managing depression
- Screening for other psychiatric disorders.
- Treatments include cognitive behavioral therapy, physical activity, cardiac rehabilitation, and/or antidepressant drugs.
- Selective serotonin reupake inhibitor (SSRI) treatment may be effective for treating depression. Studies show mixed findings in relation to cardiac events and mortality.
- Routine screening should be done in multiple settings, including the hospital, physician's office, clinic and cardiac rehabilitation center to avoid missing the opportunity to effectively treat depression.
- Coordination of care between health providers is essential for patients with combined medical and psychiatric diagnoses.

Lichtman J et al., Circulation 2008

Some of the recent studies..

- Physical activity and anger or emotional upset as triggers of acute myocardial infarction - the interheart study (Circulation 2016) – Physical exertion and anger or emotional upset are triggers associated with first AMI in all regions of the world in men and women and in all age groups with no significant effect modifiers.

- The role of myocardial micro vasculature in Mental Stress Induced Myocardial Ischemia (clinical cardiology vol. 39, April 2016) – cardiac micro circulation is a key point of interaction between mental stress and cardiac ischemia.

THANK YOU