

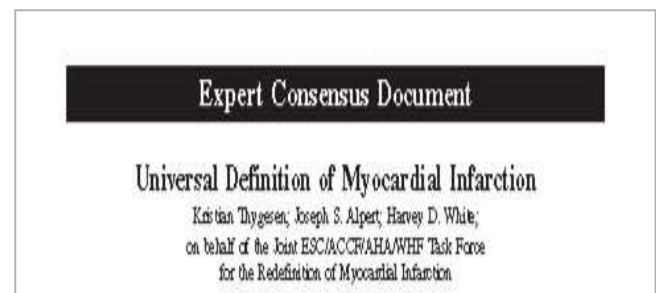
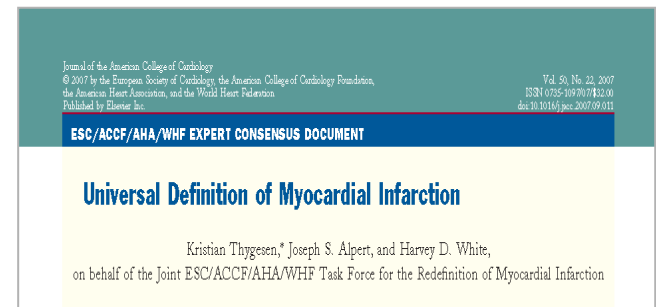
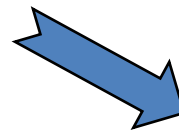
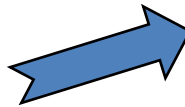
**How the Universal MI Criteria
will be used by
WHO for Coding of Diseases**



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No Conflicts

Promulgation of Criteria for the Diagnosis of Myocardial Infarction through 50 Years



Obstacles for Worldwide Applicability of Uniform Criteria for the AMI Definition

Well-resourced countries: 

The ESC/ACCF/AHA/WHF definition which has biomarkers as a compulsory feature can be used

Resource-constrained countries:  

Typical biomarker pattern cannot be made compulsory as the necessary assays may not be available due to high cost or logistic difficulties

Global Burden of Coronary Heart Disease

Manifestations of CHD

- Angina pectoris
- Unstable angina
- **Myocardial Infarction**
- Heart Failure
- Sudden death



In epidemiological studies, the incidence of MI can be used as **proxy** for estimating the burden of CHD

WHO Meeting on 16-17 April 2008 in Geneva

Participants



Simona Giampaoli



Kathleen Blaykett



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WHO Definition of AMI for Use in Settings with no Resource Constraints

Category A

- Detection of rise and/or fall of cardiac biomarkers above the 99th percentile of the upper reference limit together with evidence of ischemia with at least one of the following:
 - Ischemic symptoms
 - ECG changes of new ischemia (new ST-T changes or LBBB)
 - Development of pathologic Q waves in the ECG
 - Imaging evidence of new loss of viable myocardium or new regional wall motion abnormality

Same as ESC/ACCF/AHA/WHF

WHO Definition of AMI for Use in Settings with no Resource Constraints

Category A

Sudden (abrupt) unexpected cardiac death, often with symptoms of myocardial ischemia, accompanied by

- **presumably new ST elevation or new LBBB, and/or**
- **evidence of fresh coronary thrombus by angiography and/or autopsy,**

but death occurring before blood samples are obtained, or before appearance of biomarkers in the blood

Same as ESC/ACCF/AHA/WHF

WHO Definition of MI if the Criteria for the Diagnosis in Category A have not been met

Category B

The term MI should be used if the following criteria are present:

- Symptoms of ischemia; and**
- Development of unequivocal pathological Q waves (no pathological Q wave in the first ECG); or**
- Death with a history CHD and/or documented cardiac pain within 72 hrs before death and no evidence of non-coronary cause of death, or autopsy evidence of chronic CHD**

WHO Definition of Probable Myocardial Infarction

Category B

The term probable MI should be used when there is insufficient information to decide whether meeting the criteria in categories A and B, but either one of the following is present in a person with symptoms of ischemia:

- Development of unequivocal pathological Q waves (no pathological Q wave in the first ECG followed by a record with a pathological Q wave) or development of new ischemia (new ST-T changes and an equivocal change in Q waves); or
- Incomplete information on cardiac biomarkers provided that myocardial damage of other reasons that can cause a rise in cardiac biomarkers are excluded

WHO Definition of Prior Myocardial Infarction

- Development of new pathological Q waves with or without symptoms
- Imaging evidence of a region of loss of viable myocardium that is thinned and fails to contract in the absence of a non-ischemic cause
- Pathological findings post-mortem of a healed or healing myocardial infarction

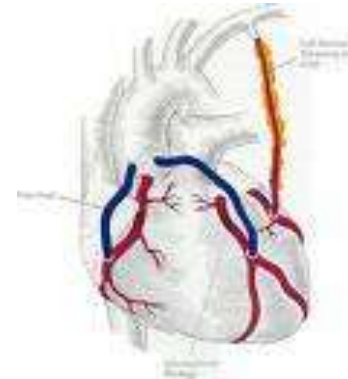
Same as ESC/ACC/AHA/WHF

WHO Definition of Periprocedural Myocardial Infarction

PCI-related increase of biomarkers $> 3 \times 99^{\text{th}}$ percentile upper reference limit (URL)



CABG-related increase of biomarkers $> 5 \times 99^{\text{th}}$ percentile URL plus either new Q waves or verified new coronary occlusion or imaging evidence of new loss of viable myocardium



Same as ESC/ACC/AHA/WHF

WHO Definition of Fatal Coronary Heart Disease

Death with none of the above and no other cause of death with any one of the following:

- Symptoms suggestive of myocardial ischemia including cardiac arrest
- Documented history (based on clinical records and ECG) of coronary heart disease
- Pathological findings of coronary atherosclerosis and myocardial scarring at autopsy

WHO Definition of Recurrent MI and Reinfarction

Recurrent MI

Incident MI is defined as the person's first MI ever. When features of MI occur in the first 28 days after an incident event, the event is not counted as a new event for epidemiological purposes. If features of MI occur after 28 days of an incident event, it is considered to be a new infarct (a recurrent event).

Reinfarction

The term reinfarction is used for an MI that occurs within 28 days of an incident or a recurrent MI.

WHO Definition of Unstable Angina

Unstable angina is diagnosed when there are new or worsening symptoms of ischaemia (or changing symptom pattern) and ischaemic ECG findings with normal biomarkers. The distinction between new angina, worsening angina and unstable angina is notoriously difficult and based on a clinical assessment and a careful and full clinical history.

Conclusions

- **In epidemiology, the incidence of MI can be used as a **proxy** for estimating the global burden of CHD**
- **The ESC/ACC/AHA/WHF criteria for the definition of MI is universally applicable**
- **The ESC/ACC/AHA/WHF criteria is applicable in low resource settings as well although if needed, with a re-alignment of the wording according to the WHO criteria**
- **The WHO definitions include additional CHD events for the sake of international coding of diseases**