American Heart Association® | American Stroke Association®

Learn and Live®

2010美国心脏协会心肺复苏和心血管急救指南

STEPHEN D. PRUDHOMME, MS

美国心脏协会/美国中风协会全球策略部副总裁

American Heart Association®

GUIDELINES CPR ECC 2010

公开声明

- 美国心脏协会员工
  - **AHA**建立培训课程及市场支持材料

- 注:美国食品药物管理局法规未能完全介定所有美国心脏协会指引中的急救方法
  - 如，心脏骤停的低温治疗和对心脏骤停的儿童病患使用胺碘酮

心肺复苏
历史

CLOSED-CHEST CARDIAC MASSAGE

W. B. Kouwenhoven, Dr. Ing., James R. Jude, M.D.
and
G. Guy Knickerbocker, M.S.E., Baltimore

Cardiac resuscitation after cardiac arrest or ventricular fibrillation has been limited by the need for open thoracotomy and direct cardiac massage. As a result of exhaustive animal experimentation a method of external transthoracic cardiac massage has been developed. Immediate resuscitative measures can now be initiated to give not only mouth-to-nose artificial respiration but also adequate cardiac massage without thoracotomy. The use of this technique on 20 patients has given an over-all permanent survival rate of 70%. Anyone, anywhere, can now initiate cardiac resuscitative procedures. All that is needed are two hands.

Experiment

Kouwenhoven, Jude & Knickerboker.
JAMA.
1960年7月9日

OCEAN CITY MEETING

MEDICAL and CHIRURGICAL FACULTY

FRIDAY SEPTEMBER 16, 1960

It's SEMIANNUAL MEETING time again

Headquarters
COMMANDER HOTEL
Boardwalk and 14th Street
OCEAN CITY, MARYLAND

SCIENTIFIC SESSION
FRIDAY, SEPTEMBER 16, 1960
12:30 P.M.

Commander Hotel
Beach Lounge, Ground Floor

Words of Welcome
Whitmer B. Firor, M.D., President,
Medical and Chirurgical Faculty

Recent Advances in Emergency Resuscitation

An illustrated symposium

Moderator
Donald W. Benson, M.D., Professor of Anesthesiology,
The Johns Hopkins University School of Medicine

1. EXTERNAL CARDIAC MASSAGE AND DEFIBRILLATION
William B. Kouwenhoven, M.D., Ph.D., Eng., Professor Emeritus of Electrical Engineering and Lecturer in Surgery, The Johns Hopkins University.
James R. Jude, M.D., Resident Surgeon, The Johns Hopkins Hospital.

2. MODERN METHODS OF ARTIFICIAL RESPIRATION
Paul R. Hackett, M.D., Associate Professor of Anesthesiology, University of Maryland School of Medicine.
Peter Safar, M.D., Chief of Anesthesiology, Baltimore City Hospitals, and Associate Professor of Anesthesiology, University of Maryland School of Medicine.

SEE REVERSE SIDE FOR ADDITIONAL INFORMATION

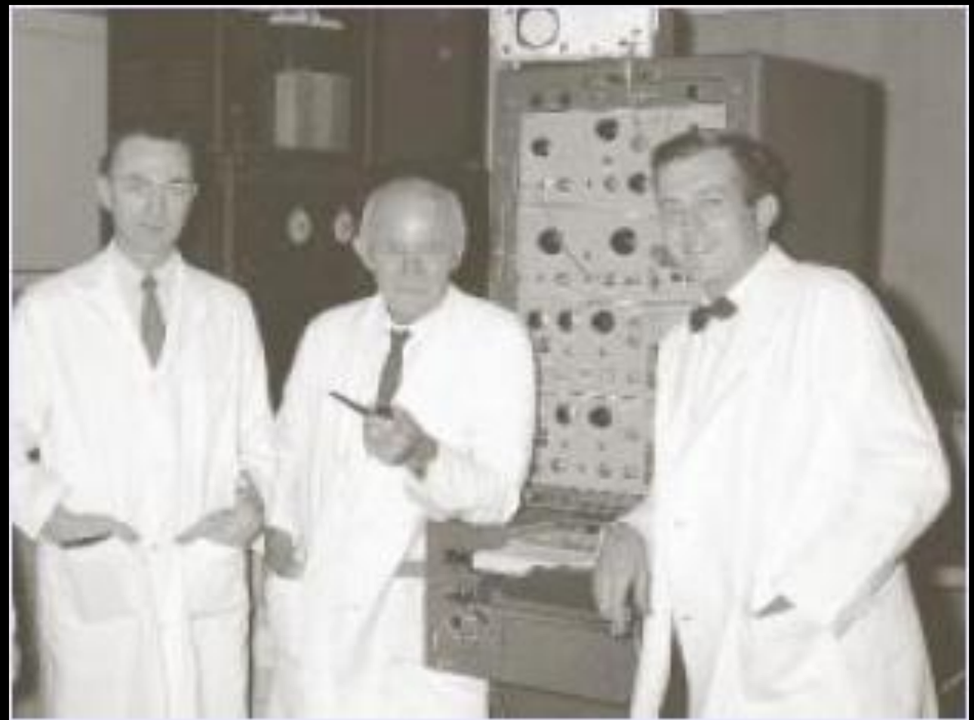
<u>胸外按压</u>
Kouwenhoven & Jude

+

<u>口对口人工呼吸</u>
Safar & Hackett

1960 – AHA成立早期CPR基金会

1960年，Drs. James Jude, William Kouwenhoven and Guy Knickerbocker在美国医学会的杂志中发表了CPR对于118位病人的运用。它们是由美国心脏协会马里兰联盟成立的.



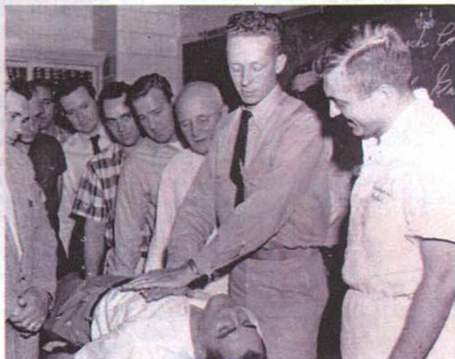
Drs. James Jude, William Kouwenhoven, Guy Knickerbocker (L to R)

CLOSED CHEST CARDIAC RESUSCITATION —

1960 –巴尔的摩港市消防部门.

Another EMERGENCY METHOD OF RESUSCITATION

**by Captain Martin C. McMahon,
Supervisor of Ambulance Service,
Baltimore, Maryland, Fire Department**



Fire Fighter Hubert Cheek of Baltimore's Ambulance No. 2 shows technique he used successfully on a victim four days after he received the training. At his right is Dr. Kouwenhoven. Guy Knickerbocker is at Cheek's left.

NOTICE — This is a brand new technique and many medical personnel may not, as yet, have had the chance to study its application and benefits. Consequently, fire departments should consult with doctors before adopting the technique for training and standard practice.

MEMBERS of the ambulance crews of the Baltimore Fire Department recently have been applying a new technique on victims of cardiac arrest or standstill. Called "closed chest cardiac resuscitation," the technique is combined with mouth-to-mouth or mouth-to-airway artificial respiration as an emergency measure for cardiac arrest victims when no medical assistance is immediately available. The cessation of all circulation is recognized by absent respirations, cyanosis, absence of the pulses in the wrist and groin, and the absence of a heartbeat. The method is simple to understand and easy to perform and is shown in illustrations on these pages. If performed correctly, it may produce a palpable pulse and sufficient circulation to keep the brain alive and maintain the tone of the heart until medical assistance is obtained.

The victim when found should be placed on a hard surface such as a floor or sidewalk (a soft surface beneath him, such as a mattress, does not offer sufficient resistance for compression of the heart). The rescuer places the heel of one hand on the sternum, or breastbone, about two inches from the lower end. The palm of the other hand is placed on top of the first hand. Pressure is now exerted downward, compressing the heart between the breastbone and the spinal column. The largest part of the heart lies directly under the sternum, and the bones of the ribs, attached to the sternum by means of cartilage, are relaxed and flexible enough to allow compression of the chest. The heart is a valve-like chamber which allows blood to move in the correct direction when pumping, and the blood in the heart is squeezed out when external pressure is applied to the chest.

The correct pressure will vary according to the size of the rescuer and his victim and can be determined readily by the rescuer. The pupils of the eyes of a victim of cardiac arrest or standstill will dilate, but if an adequate amount of blood is being moved, the pupils will start to contract. The rescuer should apply his pressure at a rate of between 60 and 80 times per minute, approximately in the range of the natural beat of the heart. The technique should be continued where the victim is found and on the litter of an ambulance until it reaches the hospital.

If possible, the hospital should be alerted beforehand as to the nature of the case and informed of what techniques are being applied. In Baltimore, ambulance crew members call fire department headquarters by radio, and then headquarters alerts the hospital emergency room by telephone.

When such a victim is brought into the Johns Hopkins Hospital, doctors use an electrocardiograph and an external defibrillator in attempting resuscitation.

In April, 1960, Captain McMahon was invited to a demonstration of the closed chest cardiac massage technique at the Johns Hopkins Hospital. (*Ed note. Readers of* FIREMEN *magazine will recall that Captain McMahon worked with Dr. Peter Safar in developing the airway used in mouth-to-airway artificial respiration. See* FIREMEN *for December, 1958.*) When he saw the demonstration, the Captain asked for instructions for the ambulance crews in the Baltimore City Fire Department. Three classes were scheduled immediately and 105 persons attended. Four days after the first class had been trained, two members of Ambulance Crew No. 2 used the technique on a sixty-year-old man who was found unconscious, cyanotic, nonbreathing and pulseless. As they had been trained, fire fighters Hubert Cheek and Marvin Burkendine removed the victim from his bed to the floor. One man started the closed chest cardiac massage and the other started mouth-to-airway artificial respiration. Shortly afterwards, the victim's pulse was beating, and within five minutes he was gasping. He was then lifted to an ambulance litter and taken to the Johns Hopkins Hospital, with oxygen being administered on the run. Hospital personnel took over the task and the victim was successfully revived.

Dr. William B. Kouwenhoven, of Johns Hopkins University, Lecturer in Surgery at the hospital, is principally responsible for the closed chest cardiac massage technique. He is also chiefly responsible for the invention of the "external defibrillator" used by the

1963

Prepared by

THE COMMITTEE ON

CLOSED CHEST CARDIOPULMONARY RESUSCITATION

of the

HEART ASSOCIATION OF MARYLAND

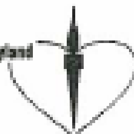
James R. Jude, M.D. — Chairman

Leonard Scherlis, M.D.

Mary E. Farr, R.N.

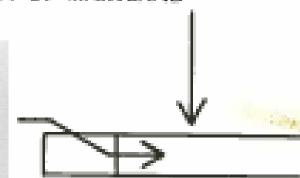
April 1962

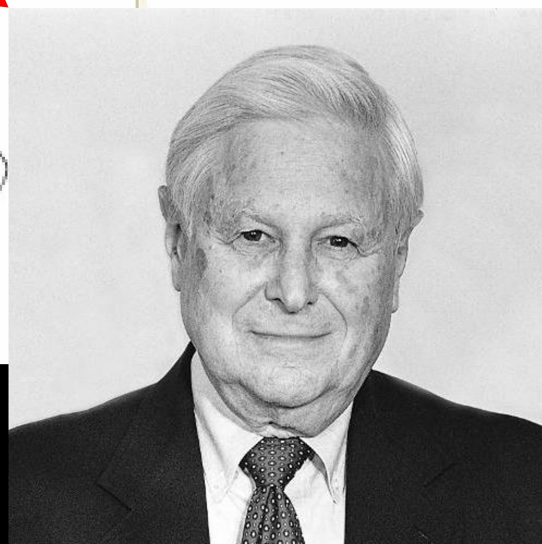
Heart Association of Maryland
415 N. Charles Street
Baltimore 1, Maryland



CARDIO-
PULMONARY
RESUSCITATION

A MANUAL FOR INSTRUCTORS –
PREPARED AND PUBLISHED BY
THE HEART ASSOCIATION OF MARYLAND





Dr. Leonard Scherlis

1963 –成立AHA第一个“CPR委员会”

1966 – AHA合作创立第一个CPR标准

Cardiopulmonary Resuscitation

Statement by the Ad Hoc Committee on Cardiopulmonary Resuscitation of the Division of Medical Sciences, National Academy of Sciences–National Research Council

In May 1966, the work of an ad hoc Committee on Cardiopulmonary Resuscitation culminated in a Conference on Cardiopulmonary Resuscitation at the National Academy of Sciences-National Research Council (NAS-NRC). This study was undertaken in response to inquiries from the American National Red Cross and other national and federal agencies concerned with the need for standardized techniques of performance, training, and retraining requirements, and designation of the categories of persons to be taught mouth-to-mouth ventilation and external cardiac compression under present limitations on the supply of instructors. The ad hoc committee carefully reviewed and discussed these matters with representatives of over 30 national organizations attending the conference. The full proceedings of the conference will be published by the NAS-NRC. A summary of the recommendations of the ad hoc committee follows.

In November 1958, a Conference on Artificial Respiration was held at the National Academy of Sciences-National Research Council, and led to the publication in January 1959 of a "Statement on Emergency Artificial Respiration Without Adjunct Equipment." This statement unanimously endorsed [illegible]-mouth and mouth-to-nose techniques of artificial respiration as the most practical methods of emergency [illegible] without adjunctive equipment [illegible] age. Since [illegible]

[illegible]

In an editorial in *Circulation* in September 1962,[1] closed-chest cardiopulmonary resuscitation was endorsed as a *medical* procedure. Subsequently, the method was reclassified as an *emergency* procedure in a second editorial in *Circulation* in May 1965.[2] This was endorsed by the American Heart Association, the American National Red Cross, the Industrial Medical Association, and the US Public Health Service, which strongly recommended that the technique should be applied by "properly trained individuals of medical, dental, nursing and allied health professions and of rescue squads."

Since publication of the second editorial, the American Heart Association, the Public Health Service, and other organizations have inaugurated intensive training programs in cardiopulmonary resuscitation in response to the widespread interest and enthusiasm of highly motivated persons at all levels from first aid workers to professional medical personnel. Their experiences have indicated that clinical results vary widely and depend upon the exact technique taught, the effectiveness of training and periodic retraining, the personnel taught, the selection of cases, and numerous other factors. These considerations have guided the ad hoc Committee on Emergency Cardiopulmonary Resuscitation in formulating the following recommendations.

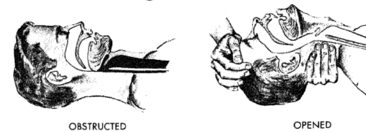
ABCD Steps

[illegible]

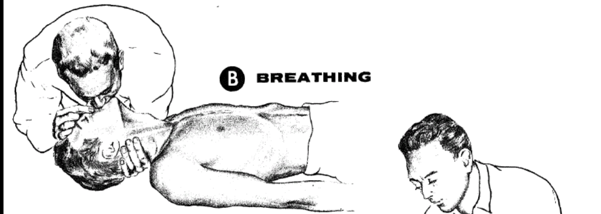
Heart-Lung Resuscitation

National Academy of Sciences—National Research Council

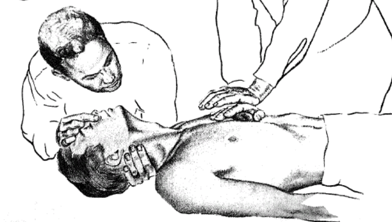
A AIRWAY



B BREATHING



C CIRCULATION



1966年，AHA和国家科学研究所和国家科研委员会创立第一个CPR标准和执行

1972 –第一个综合的小区CPR培训项目

西雅图消防队长

第一目标是在西雅图培训至少100,000公民。

西雅图持续成为全世界最高心脏骤停存活率的地区。

Dr. Leonard Cobb

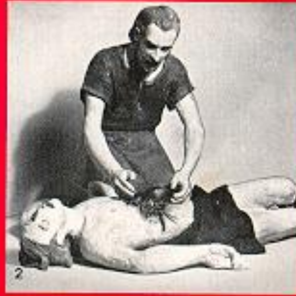
SUPPLEMENT TO

JAMA

The JOURNAL of the American Medical Association

Standards for Cardiopulmonary Resuscitation (CPR) and Emergency Cardiac Care (ECC)

1. Early Ages - Flagellation Method
2. Early Ages - Heat Method



3. 1530 - Bellows Method
4. 1711 - Fumigation Method

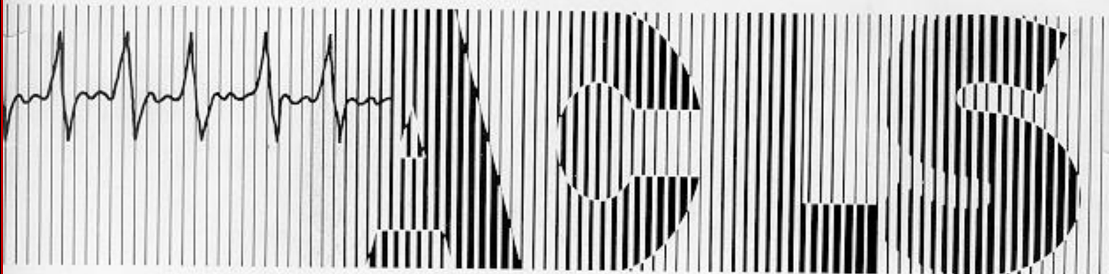
5. 1770 - Inversion Method
6. 1773 - Barrel Method

7. 1803 - Russian Method
8. 1812 - Trotting Horse Method

February 18, 1974
Volume 227 No 7

1974
AHA第一本 心肺复苏和心血管急救指南

American Heart Association 7320 Greenville Avenue, Dallas, Texas 75231

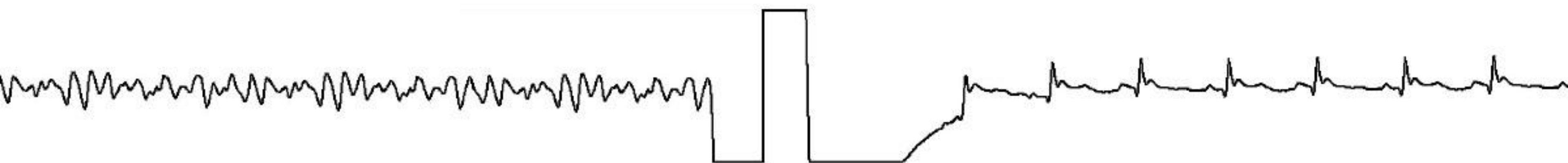


ADVANCED
CARDIAC
LIFE
SUPPORT

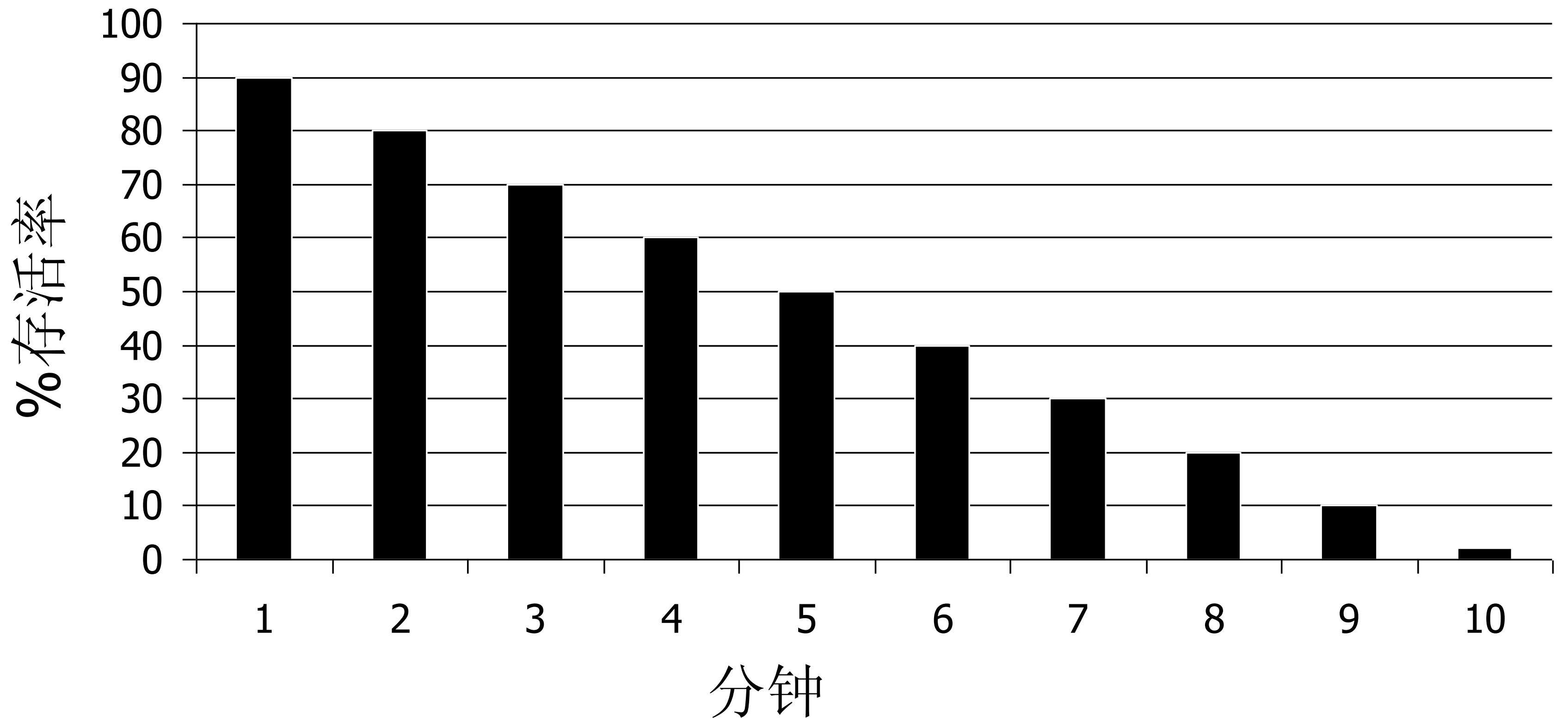
© 1975 AMERICAN HEART ASSOCIATION

1975
AHA第一个高级心血管生命支持课程

简短介绍美国AED历史

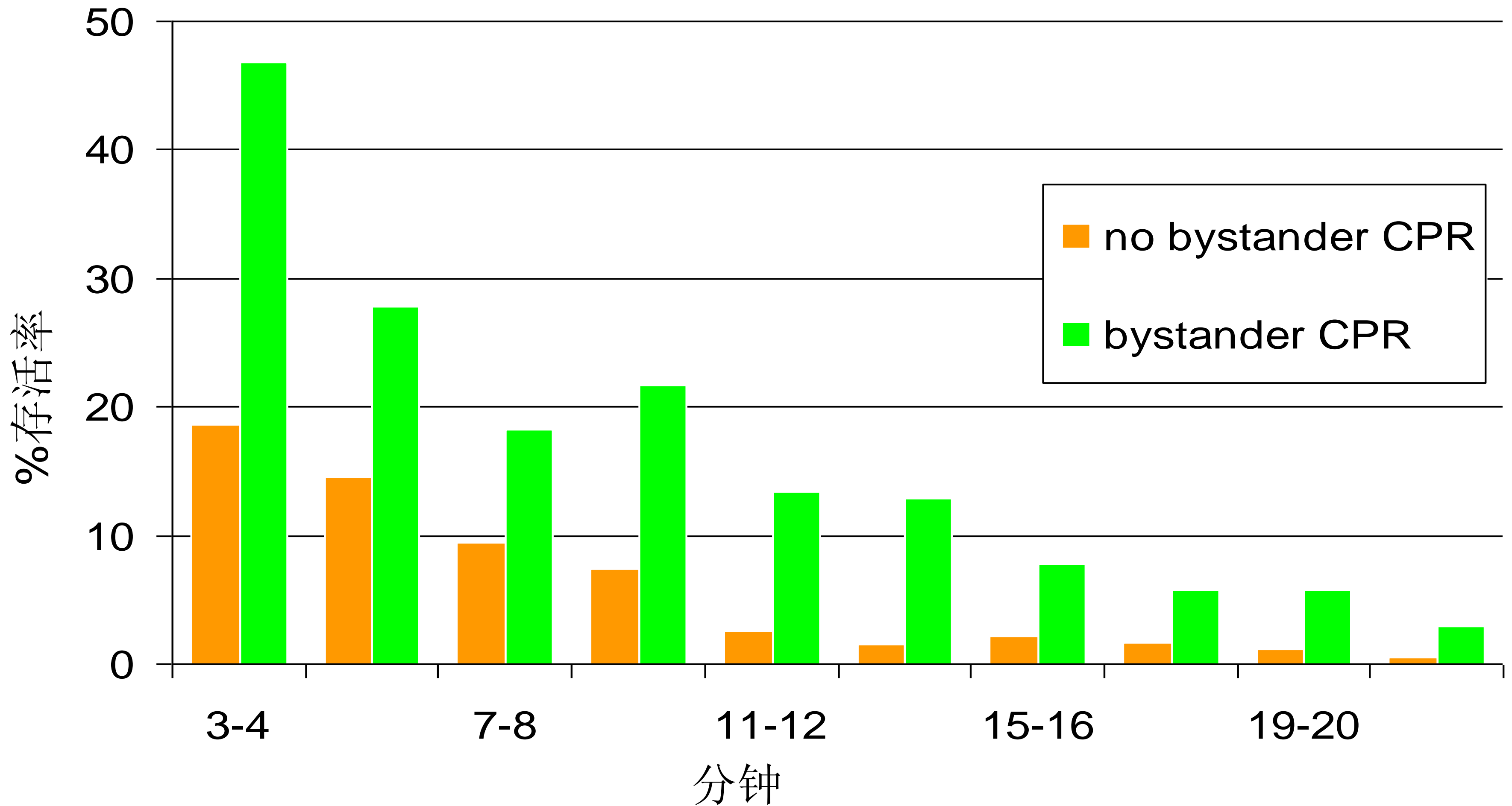


除颤时间和目击室颤心脏骤停存活率的关系



Cummins, 1989

1个月的病患存活率和除颤时间的关系（有旁观者和无旁观者的CPR）



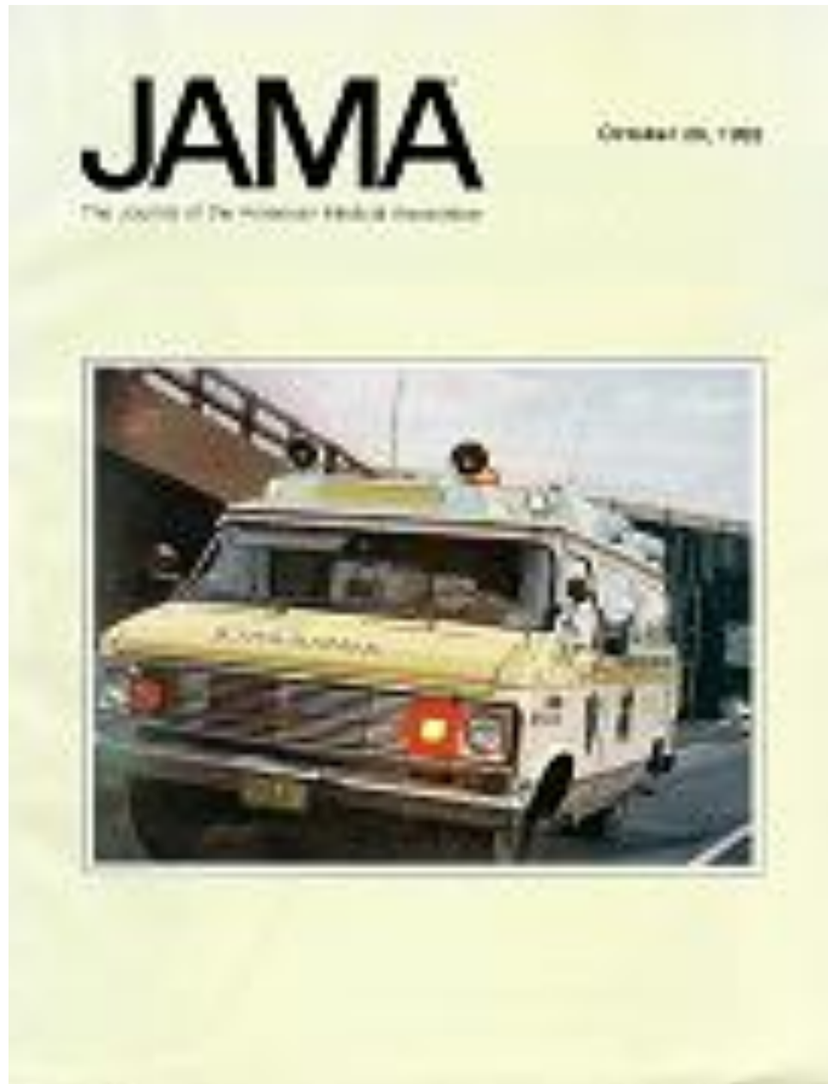
1975

在美国第一次AED的使用发生在西雅图消防队

Gordon Vickery,
西雅图消防队队长.

Dr. Leonard Cobb,
Medic One
医学总监

1992



AHA ECC指南建议提高使用AED从而缩短院外心脏骤停患者从“心脏停跳到起搏的时间”

1994

AHA PAD（周边动脉疾病）会议和声明

Circulation. 1995;92:2740-2747.

Circulation. 1995;92:2763.

为AED制造商提供了指导

在美国，只有**30%**的紧急医疗服务系统在救护车里装置了除颤器

价格范围：**$4000**至**$10 000**

1998

底能量，非升级型双相AED进入市场

高效率电击

底耗量（轻便电池，更耐电）

低价

2000

AED零售开始（需要处方）

心脏骤停存活率法案(H. R. 2498)通过美国代表大会:

- AED放置联邦政府大楼
- 为AED使用者或拥有者提供保护

2002

第一个“家庭使用AED”通过FDA（美国食品药品管理局）的审批，可销售

在院前心脏骤停患者中，旁观者AED使用频率为2%。但随时增长

Culley et al., Circulation. 2004;109: 1859–1863

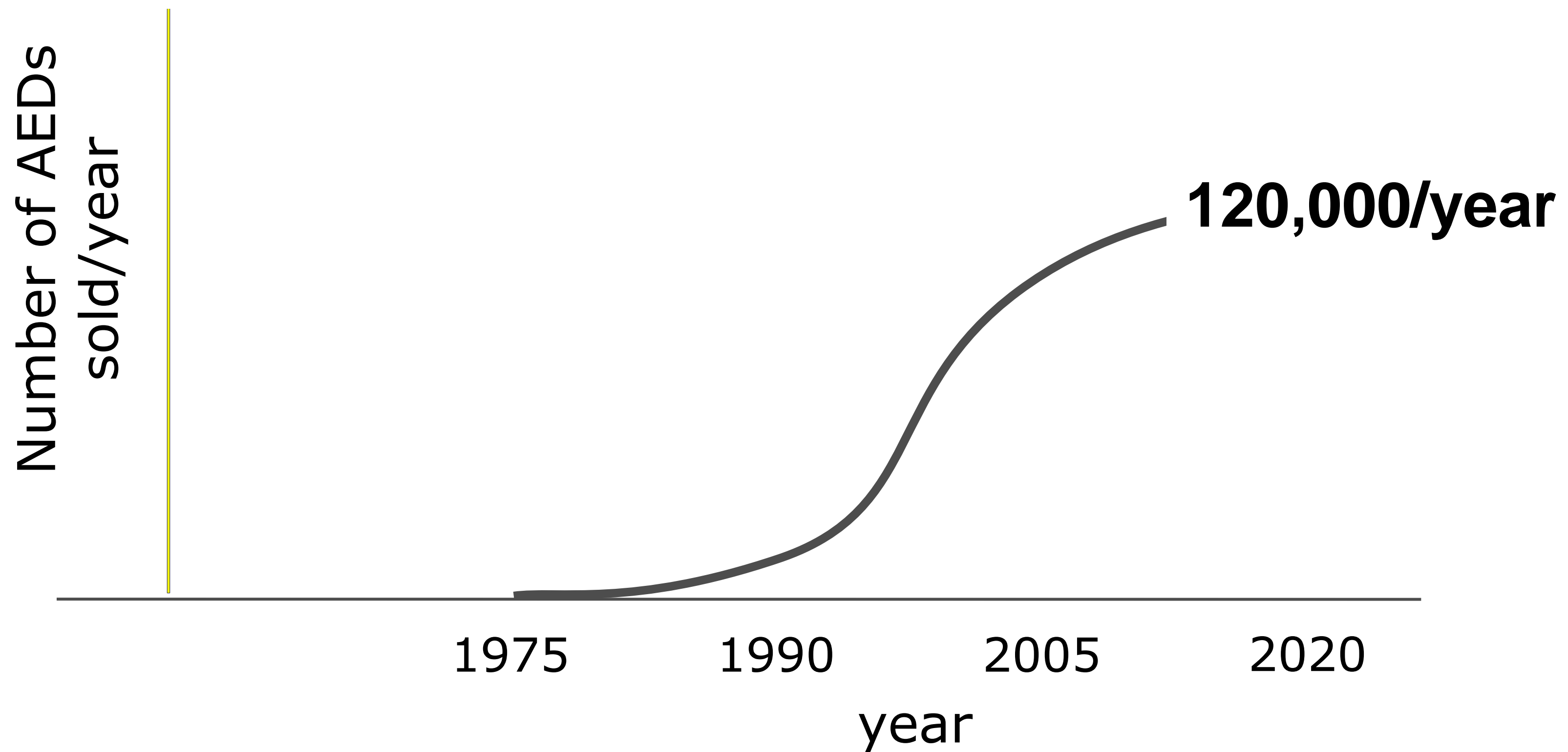
2004

美国联邦航空管理局要求所有商用客机设置AED

美国食品药品管理局接触AED需处方销售条例

2009

每年美国AED销售达 120,000



AED时间表

EMS第一次使用AED

AHA PAD大会

60万每年销售

2% 使用率

AED w/o Rx

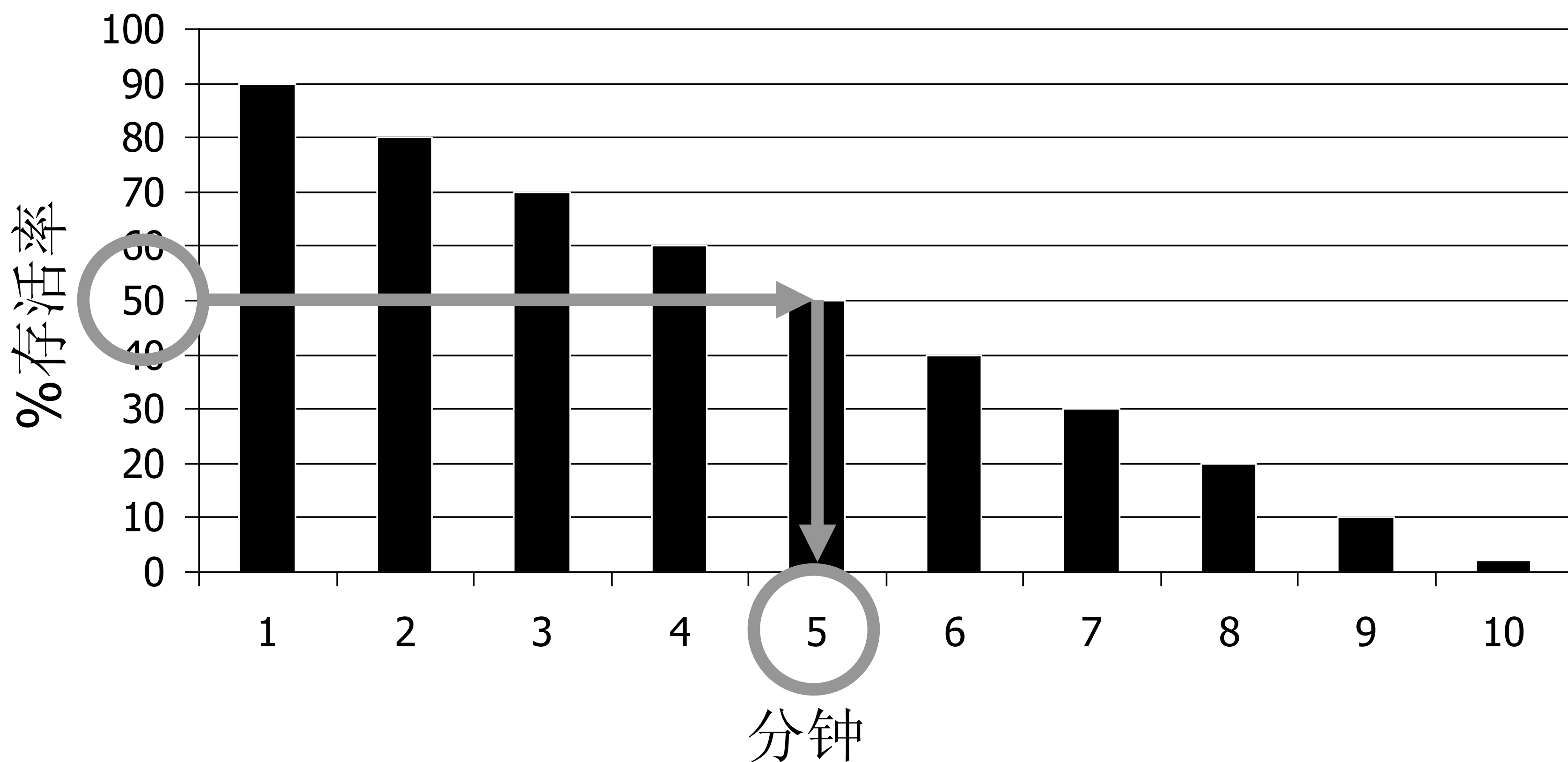
120万每年销售

“早期使用者”

“早期大众化”

早期除颤策略

除颤时间和目击室颤心脏骤停存活率的关系



Cummins, 1989

来自EMS迅速应对

Rea et al., Circulation. 2006;114:2760-2765.

King County, Washington (西雅图除外)

- **1位EMS**
- 目击室颤心脏骤停**: 46 %**存活率**to DX**
- 目击者**CPR**：**72.4 %**
- 医疗急救人员平均应对事件: **5.7**分钟**. (SD 2.7)**

第一目击者的迅速应对

White, et al., Resuscitation 65 (2005) 279–283.

Rochester, Minnesota

- 警察和消防队**AED**训练**/**配置
- 目击室颤心脏骤停**: 46 %**存活率**to DX**
- 目击者**CPR: 48.2 %**
- 平均“电话求救电击”**: 5.6**±**1.5 min.**

AED进入公共场所

Caffrey, et al., NEJM 2002;347:1242-7.

芝加哥机场。伊利诺伊州芝加哥市

- 目击者
- 目击室颤心脏骤停: 1岁患者中，**62.5 %**存活率.
- 目击者**CPR: 94.4 %**
- 平均“电话求救电击”：**<5**分钟.在**50 %**的成功存活案例中

自動体外式除細動器
AED
24hrs HOT MENU
cardiolife
AED
緊急時に
ご使用ください
AED

非医务人员AED课程

Valenzuela, et al. NEJM 2000;343:1206-9.

赌场。内华达州拉斯韦加斯

- 保安人员**CPR/AED**培训
- 目击室颤心脏骤停**: 59 %**存活率**to DX**
- 目击者**CPR: 49 %**
- “倒下**-**电击”时间**: 4.4±2.9**分钟

非医务人员AED课程

PAD Trial Investigators. N Engl J Med 2004;351:637-46.

24个北美区域，993个小区的参与者参与了

- **>19,000 CPR/AED-**接受培训的志愿者
- 所有心脏骤停**: 23.4 %**存活率**to DX**
- 目击者**CPR: 64.8 %**
- “呼叫**-**至第一次电击”时间：**6.0**±**4.7**分钟

高危人群家中AED

Bardy et al. NEJM 2008;358:1793-804.

AED设置在2495户高危人群家中（有过Anterior-wall Q-wave或没有过Q-wave MI）

- 家庭对CPR和AED使用操作熟悉
- 室颤心脏骤停: 28.6 %存活率to DX
- 目击者CPR频率:无报告
- “致电求救”时间:无报告

5个策略总结

EMS迅速应对

“第一目击者”迅速应对

AED进入公共场所

设立非医务人员的AED课程

高危人群家里设置AED

谢谢!

STEPHEN D. PRUDHOMME, MS

美国心脏协会/美国中风协会全球策略部副总裁