NRCPR : CPA Inclusion Criteria

1. 病院施設中のすべての患者*、訪問者、従業員、スタッフを対象とする。
   - 脈なし、または組織灌流が不十分なために
     胸骨圧迫* かつ/または
     心室細動か無脈性心室頻拍に対する除細動
     による心肺蘇生法を施行された、心肺停止事例
1. 院内心停止として、病院全域(一般入院病棟)の事例と、集中治療部門(ICU、緊急部、手術室、PACU、分娩室)で、救急部門スタッフにより応答された事例を含む。

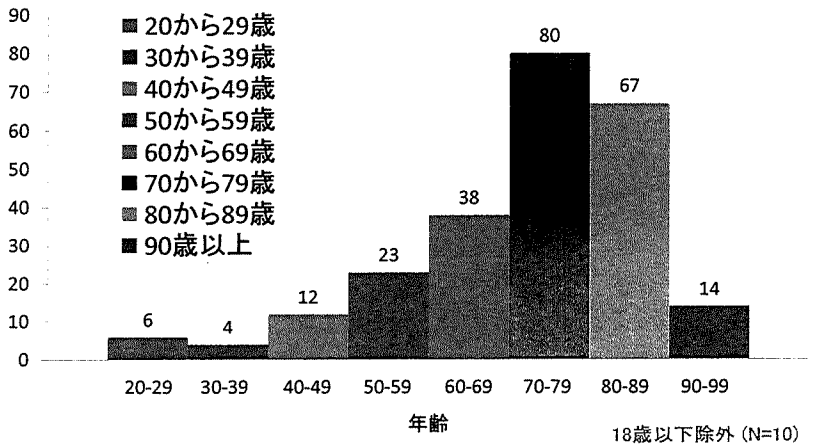
*最小の入院期間の規定はない。
*脈があっても胸部圧迫を必要とする低灌流例は含まれている。
(例: 徐脈で低灌流により蘇生中に胸部圧迫を受けた子供)
** ICUs、PACU、手術室、分娩室で胸骨圧迫かつ/または、除細動を必要とした全ての事例は、たとえ病院が蘇生記録を完成することを要求する症例であっても、登録すべきである。

NRCPR : CPA Exclusion Criteria

- 搬送途中に生じた心停止を含めた、院外心停止例。
  院到着前の心停止、病院到着後に緊急部で心肺蘇生術が継続された事例、病院到着後20分間以上ROC3.4が維持する前に、緊急部で再開された蘇生事例。
- 病院施設内の第1発見者が対応したが、EMS人員(消防士、救急隊員、救急車)により継続した蘇生が引き継がれた事例。
- 胸部圧迫、そして/または、除細動を必要としない事例。
- VFかpulseless VTに対して胸骨圧迫、除細動を必要とせず、脈があるためカルディオバージョンを実施した事例。
- ICDよる除細動成功例で、胸骨圧迫、体外式除細動を必要としない事例。
- 化学Codeの事例;心停止時に胸骨圧迫、除細動を実施せず、薬剤投与だけを許容する変更DNR/DNAR状態の事例。
- 脳死後に生じた心停止。

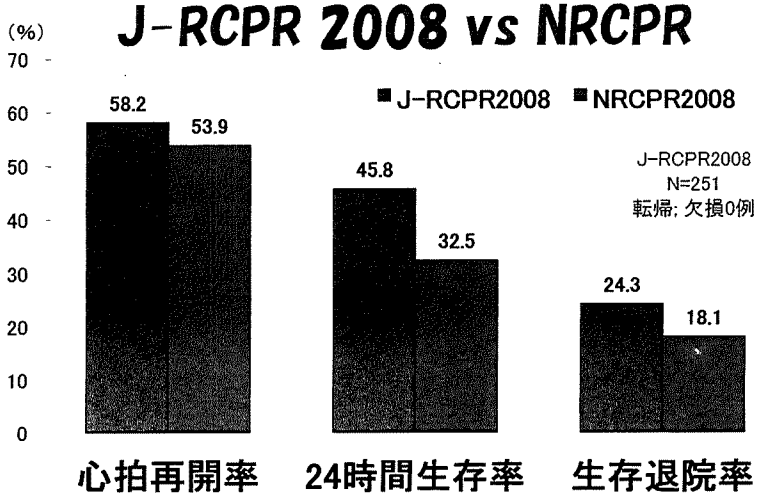
院内心停止：発症時年齢
J-RCPR 2008

251 adults (71.4±14.7, M/F 161/90) enrolled.



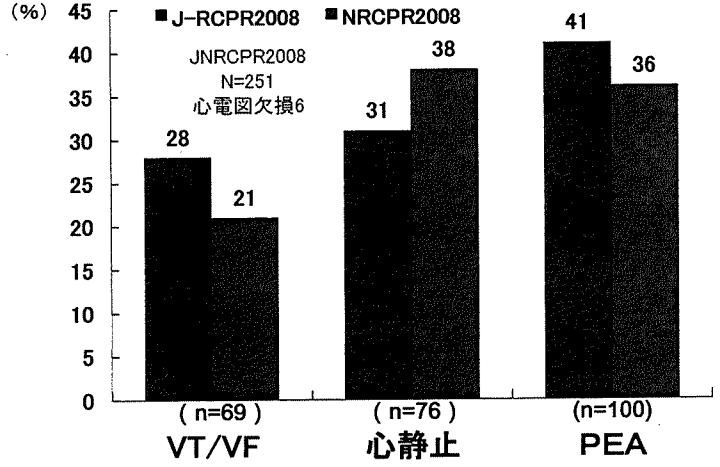
18歳以下除外 (N=10)

ROSC・24hr生存率・生存退院率
J-RCPR 2008 vs NRCPR



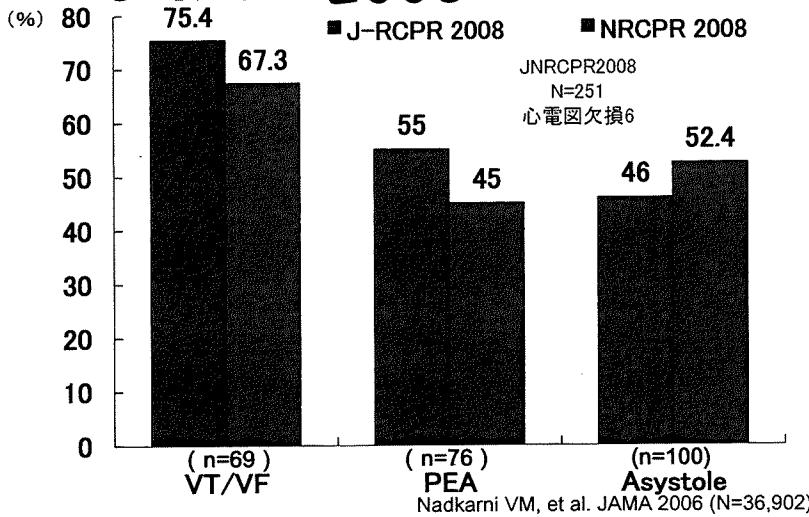
NRCPR (N=86748) Peberdy MA, et al. JAMA 2008

院内心停止：発症時心電図
J-RCPR 2008 vs NRCPR



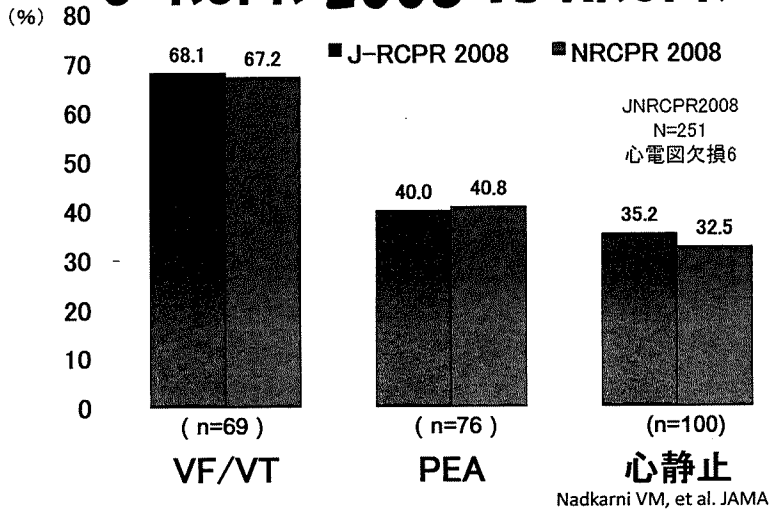
NRCPR (N=86748) Peberdy MA, et al. JAMA 2008

心拍再開率
J-RCPR 2008 vs NRCPR



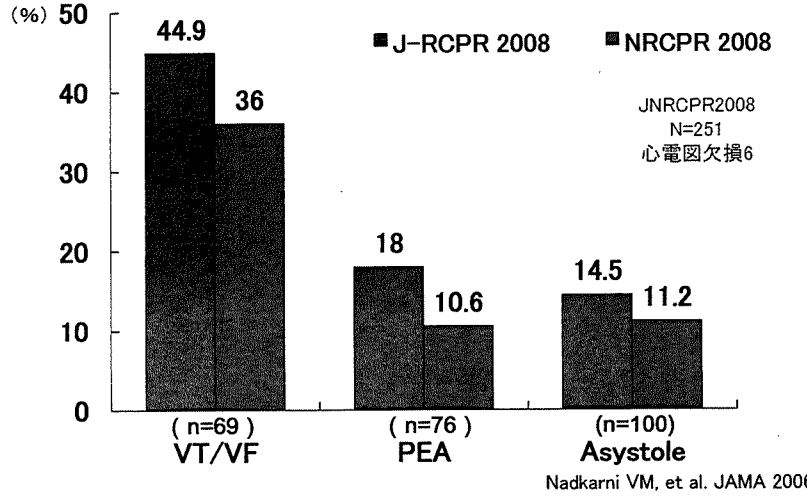
Nadkarni VM, et al. JAMA 2006 (N=36,902)

24hr生存率
J-RCPR 2008 vs NRCPR



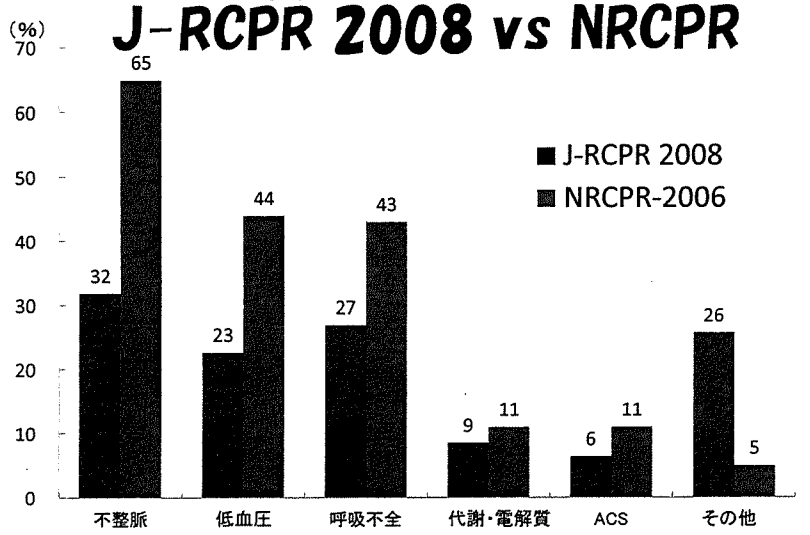
Nadkarni VM, et al. JAMA 2006

30日生存率
J-RCPR 2008 vs NRCPR



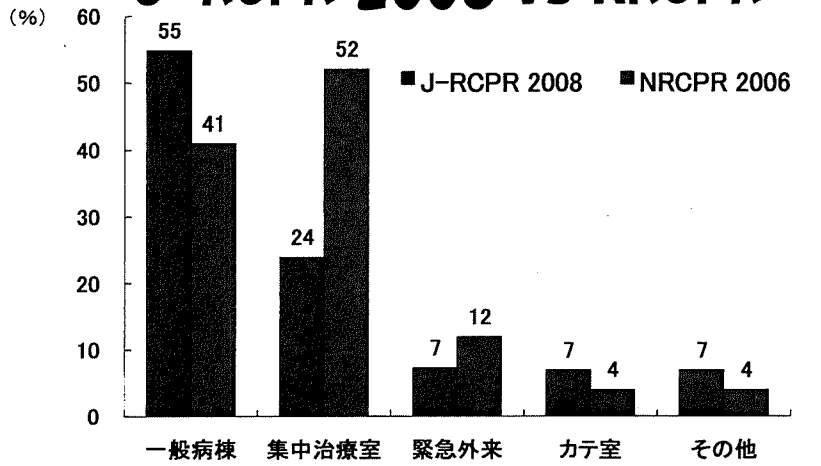
Nadkarni VM, et al. JAMA 2006

院内心停止の原因
J-RCPR 2008 vs NRCPR



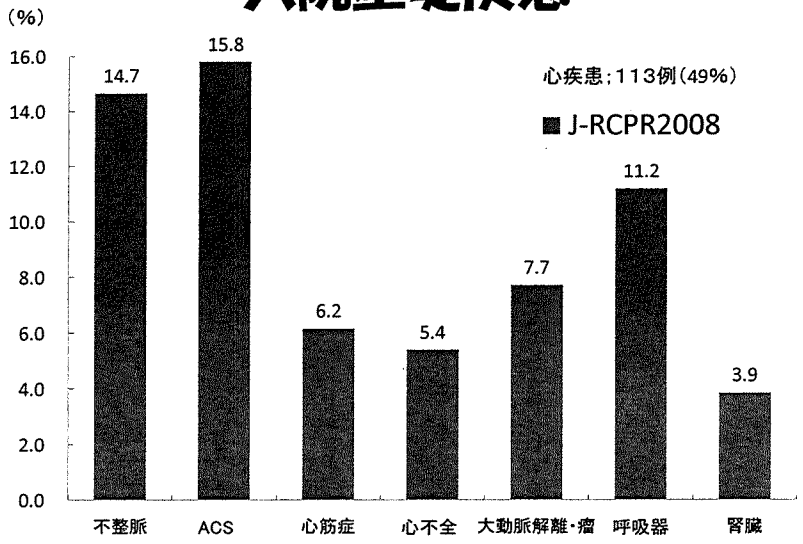
Nadkarni VM, et al. JAMA 2006

院内心停止：発症場所
J-RCPR 2008 vs NRCPR



Nadkarni VM, et al. JAMA 2006

入院基礎疾患



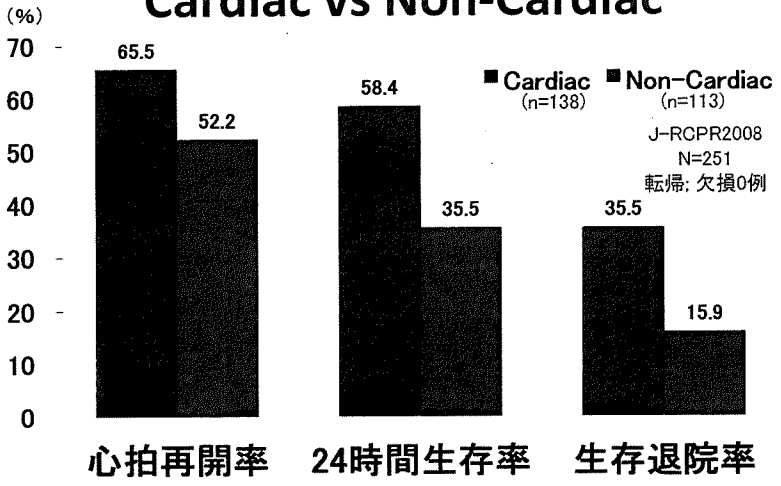
循環器疾患で入院していた症例：
心疾患 VS 非心疾患

	心疾患 n=113	非心疾患 n=138	P value
Witness of CPA	90.3%	66.2%	<0.0001
The Place of CPA confirmed			
General Ward	41.1%	67.6%	<0.0001
Intensive Care Unit	25.9%	16.9%	
Catheter Laboratory	15.2%	1.5%	
Emergency Room	11.6%	5.9%	
Other Place	6.20%	8.10%	

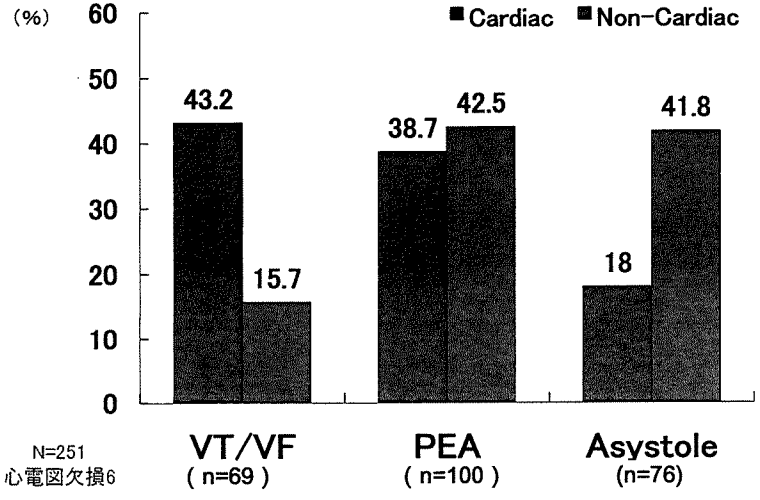
循環器疾患で入院していた症例：心疾患 VS 非心疾患

	心疾患 n=113	非心疾患 n=138	P value
The direct cause of CPA			
Fatal Arrhythmia	51.4%	17.2%	
Hypotension	22.5%	15.7%	
ACS	17.1%	3.0%	<0.0001
Respiratory Failure	9.9%	33.6%	
Metabolic Disturbance	4.5%	9.0%	
Other or Unknown	15.3%	36.7%	

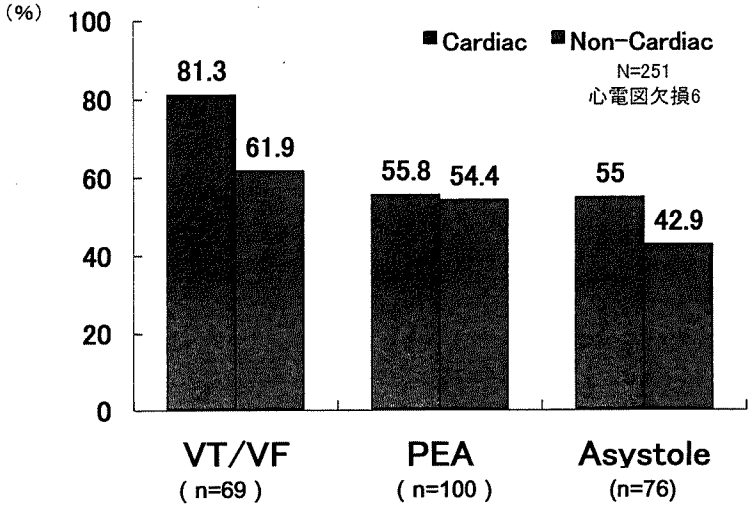
ROSC・24hr生存率・生存退院率
Cardiac vs Non-Cardiac



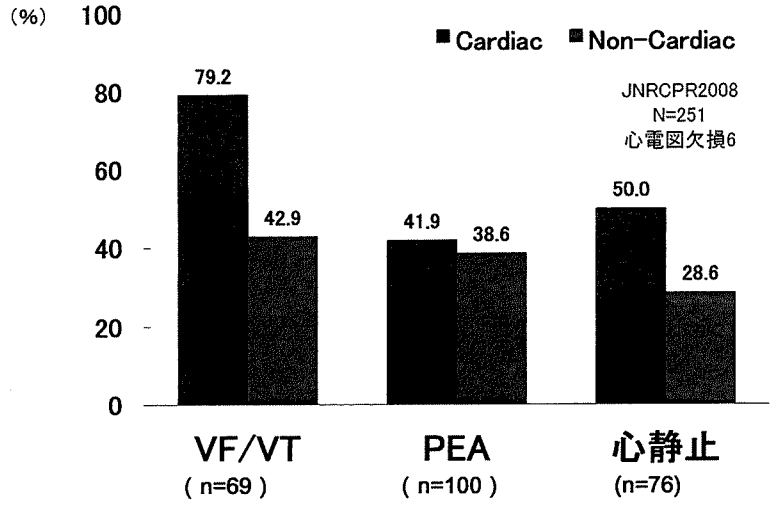
First Documented Rhythm
Cardiac vs Non-Cardiac



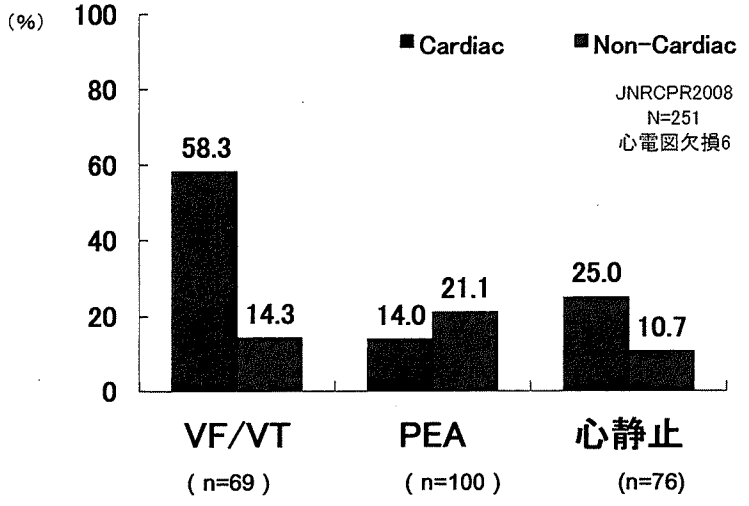
ROSC
Cardiac vs Non-Cardiac



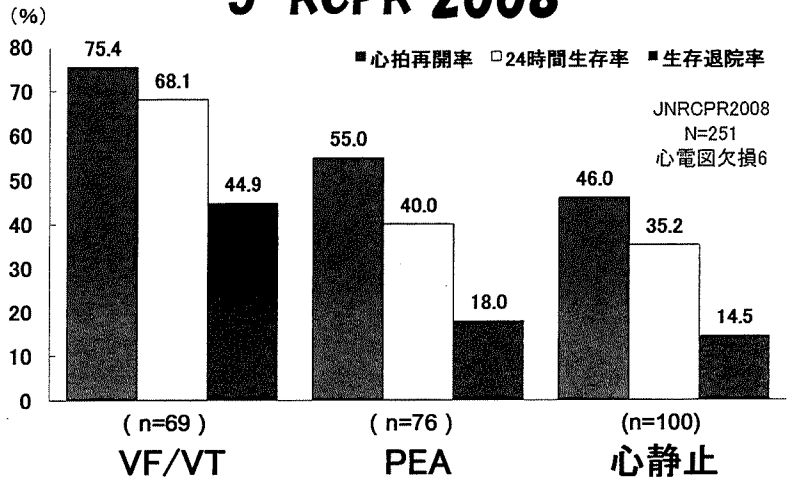
Survived at 24hr After Cardiac vs Non-Cardiac



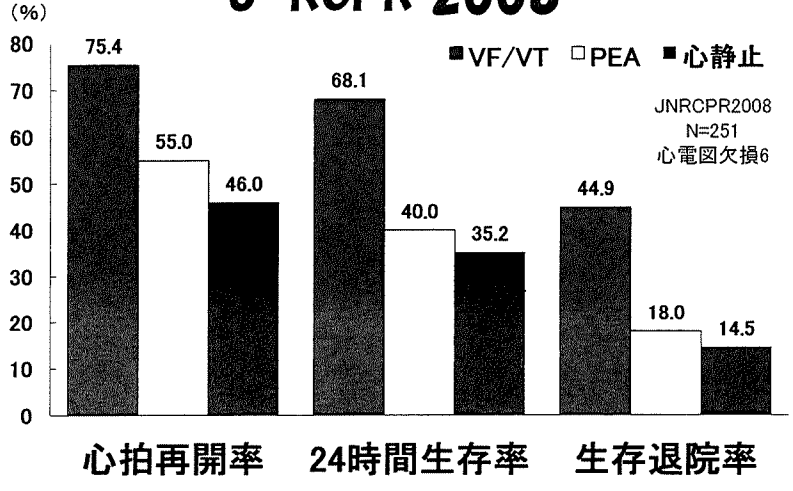
In-Hospital Mortality Cardiac vs Non-Cardiac



ROSC・24hr生存率・30日生存率 J-RCPR 2008



ROSC・24hr生存率・30日生存率 J-RCPR 2008



Results

• 251 adults (71.4±14.7, M/F 161/90) enrolled. The prevalence of VF/VT as first documented rhythm was 28.2%, asystole was 31.2% and PEA was 40.3%.

•ROSC was 58.6% and rates of survival on 24 hr after CPA was 42.6%.

•Immediate cause(s) of event were arrhythmia 31.9%, hypotension 18.3%, acute respiratory insufficiency 22.3%.

•70.1% of the patients were confirmed alive within 10 min before CPA.

Conclusion

This is the first report to evaluate in hospital CPA in Japan. These data showed that initial cardiac arrest rhythm and immediate cause(s) of event may play important role on outcomes.

J-PULSE Ⅱ
病院内での取り組み:院内心停止登録から

成人症例と小児症例の比較
—Children are not small adults—

黒澤茶茶[1),3)] 清水直樹[2),3)]

1) 静岡県立こども病院 救急総合診療科
2) 東京都立小児医療センター 救命・集中治療部
3) 国立成育医療センター研究所 成育政策科学研究部

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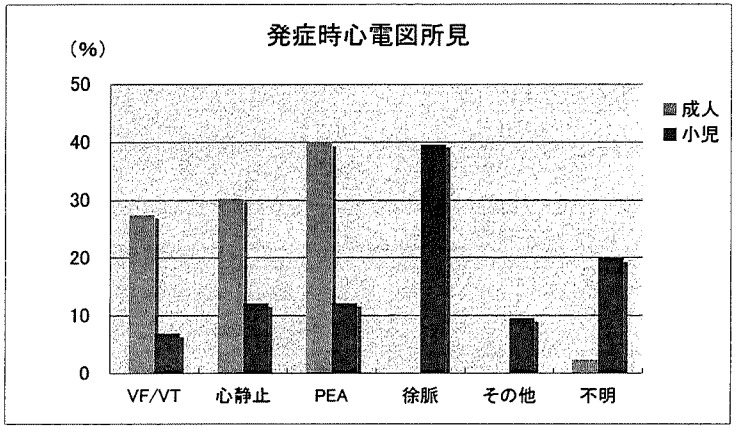
はじめに

- 国内外での院外心停止に関する疫学調査より、様々なデータの報告
- 一方、国内での院内心停止の疫学調査結果に関しては、明確なデータがない
- 厚生労働科学研究(野々木班)において、2008年より院内心停止の症例登録(J-RCPR : Japanese Registry of CPR for In-hospital Cardiac Arrest)を開始
- 同(丸川班)において、2006年より小児心肺蘇生レジストリを構築し、2008年より試験的に始動

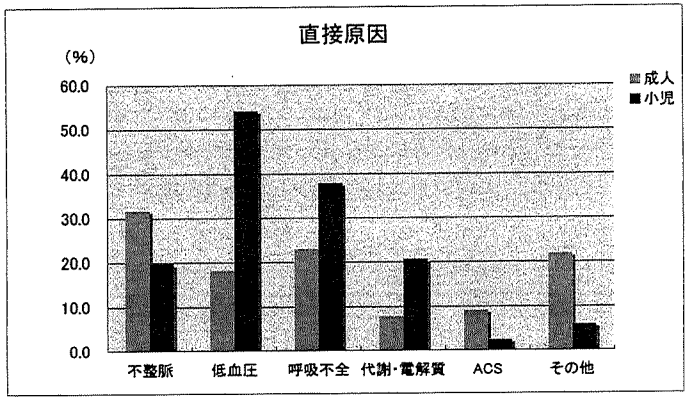
対象と方法

- 対象
  - J-RCPR (Japanese registry of Cardiopulmonary Resuscitation)に登録された成人症例251例(2008年)
  - 小児心肺蘇生レジストリに登録された小児症例116例(2002-2008年)
- 方法
  - 登録データから、発症時心電図所見、直接原因、発生場所、予後(自己心拍再開率、生存退院率)について成人例と小児例で比較検討を行った

結果1



結果2



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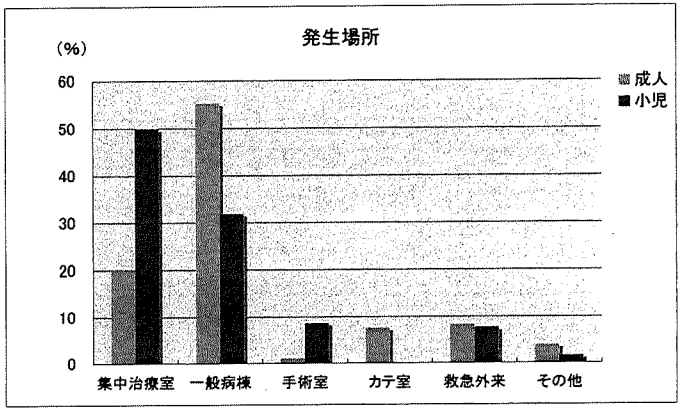
厚生労働科学研究費 野々木・坂本班 J-PULSE・SAVE-J 合同公開報告会 2010.2.23

結果3



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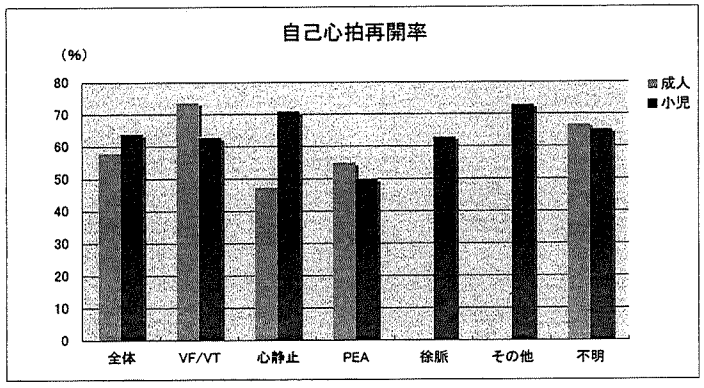
結果4



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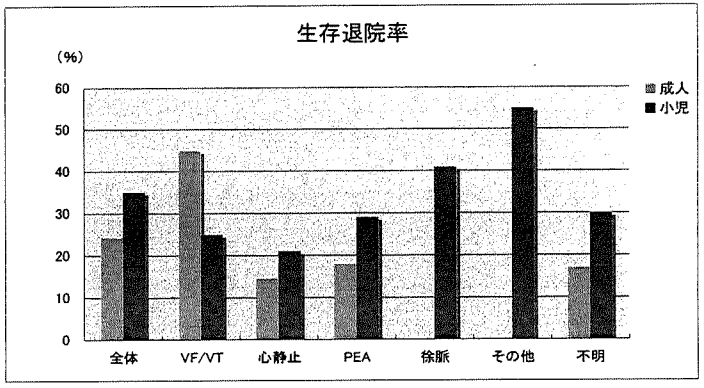
結果5



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結果のまとめ

- 蘇生対象となる小児症例の約40%は徐脈の症例であり、心停止前の介入の必要性が再認識された
- 直接原因としては、成人が不整脈が最多であるのに対し、小児では低血圧、呼吸不全、不整脈の順であり、多くの症例では呼吸不全／循環不全を経て心停止へ至ると推察される
- 発生場所は、小児において集中治療室での発生率が高かったが、対象施設の特性による影響も大きいと考えられる
- 予後に関しては、自己心拍再開率は大きな差はないものの、生存退院率は小児の方が高い傾向がみられた

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小児心肺蘇生レジストリ

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背景

- 小児救急・集中治療領域においては、小児重症患者の集約化の遅れと治療戦略コンセンサスの不足が指摘され、各種症例登録基盤の必要性を認識
- 厚生労働科学研究（平成18-20年）「AEDを用いた心疾患の救命率向上のための体制の構築に関する研究（丸川班）」「小児心肺停止例へのAED普及にかかわる研究（清水分担班）」の枠組みの中で、小児心肺蘇生レジストリを構築
- 同（平成20-22年）「成育疾患のデータベース構築・分析とその情報提供に関する研究（原田班）」とも連携

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小児心肺蘇生レジストリ

- 米国を中心に展開する NRCPR (National registry of Cardiopulmonary Resuscitation) に基づくレジストリの登録項目を選択
- 登録作業はWeb上で展開
- 全国からの症例集積が必要であり、日本集中治療医学会新生児・小児集中治療委員会PICU-EBM作業部会と連携
- 国内の院内心停止登録システムであるJ-RCPR (Japanese registry of Cardiopulmonary Resuscitation)（厚生労働科学研究 野々木班）＝成人領域との連携
- NRCPR＝国際的な連携

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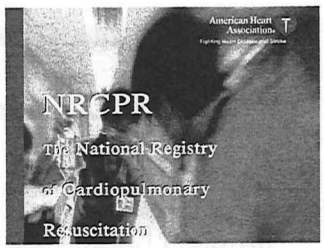
NRCPRとは？

- 2000年から米国を中心にスタートした院内心肺蘇生事例の国際的データベース
- 米国、カナダ、ドイツ、ブラジル、日本 の430以上の施設が参加、100,000件以上の蘇生事例集積



CPA; cardiopulmonary arrest
ARC; acute respiratory compromise
MET; medical emergency team （2006年～）

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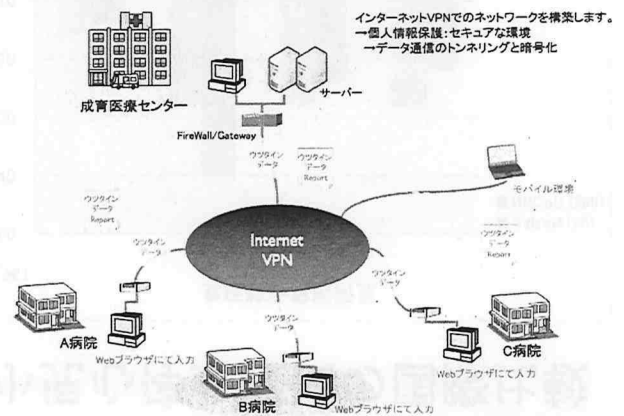
日本語Web入力システム構築

ウツタインデータ収集システム イメージ



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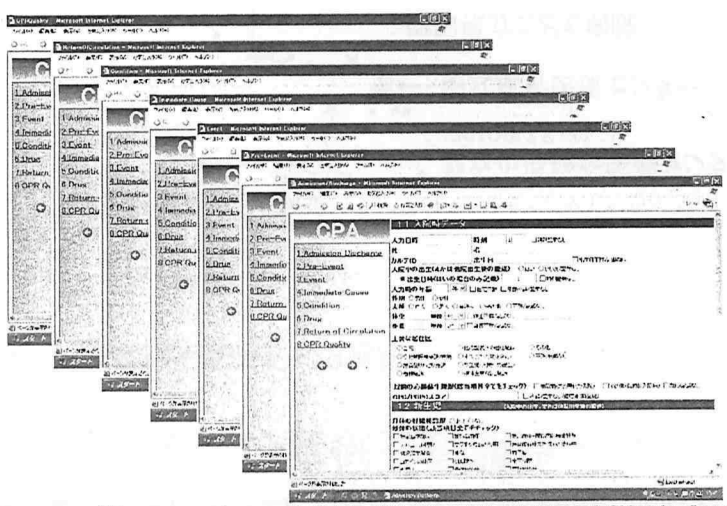
Web入力テンプレート



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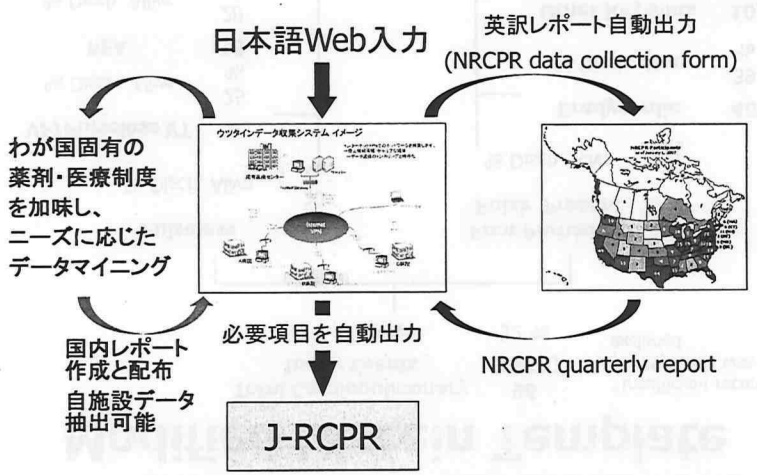
本システムとJ-RCPR・NRCPRとの関係性



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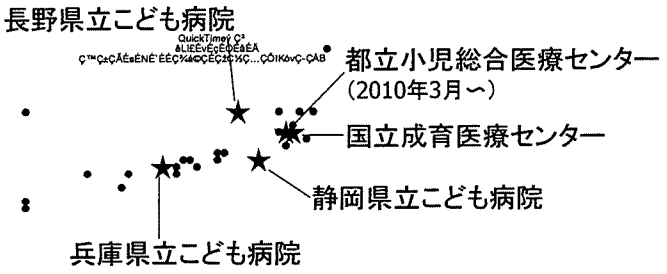
各施設からの症例登録開始(2008年～)

日本小児総合医療施設(29施設)



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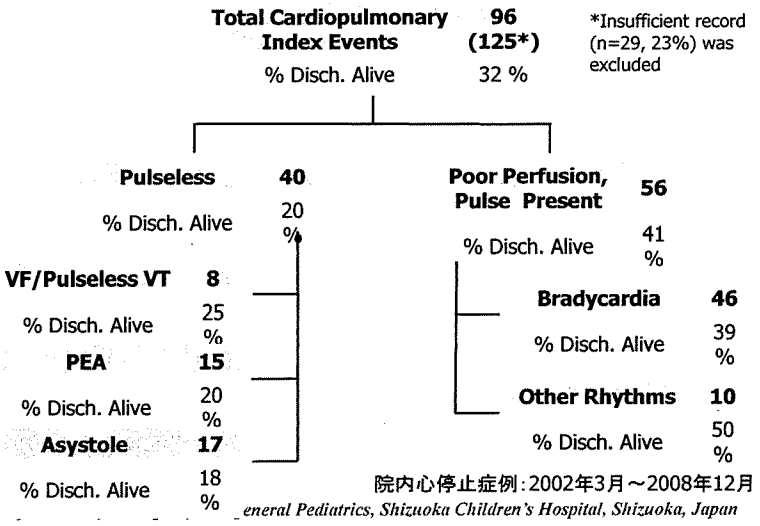
Modified Utstein Template



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小児院内心停止の症例ボリウム

- Nadkarni, et al, JAMA 2006
  - First documented rhythm and clinical outcome from in-hospital cardiac arrest among children and adults.
    - January 2000 – March 2004
    - 253 US and Canadian hospitals
    - 37,782 cases registered
    - **880 cases (2.3 %) were children (<18 y)**
    - Only about 200 cases / year
- 日本の小児心肺蘇生レジストリから 50例

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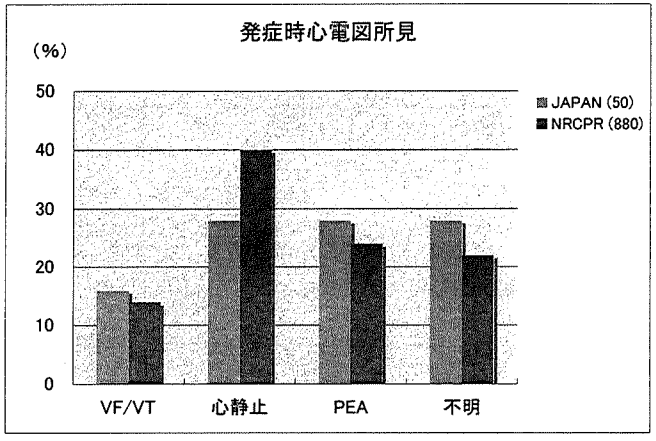
小児心停止症例の国際比較



Nadkarni, et al, JAMA. 2006;295(1):50-70

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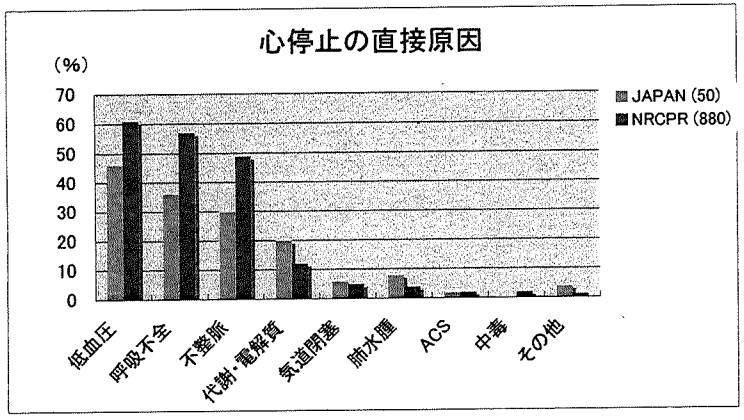
小児心停止症例の国際比較



Nadkarni, et al, JAMA. 2006;295(1):50-70

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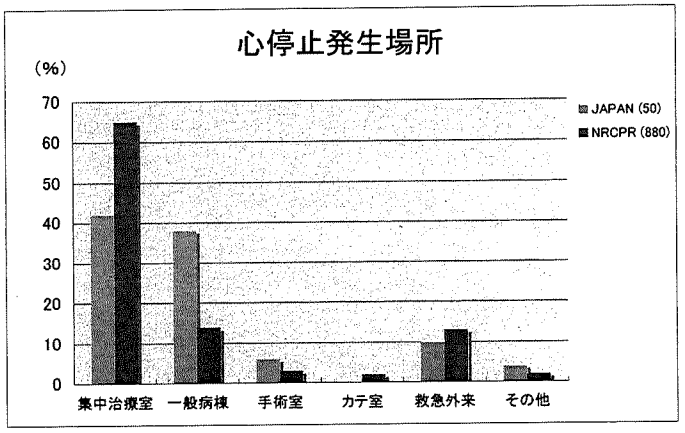
厚生労働科学研究費 野々木・坂本班 J-PULSE・SAVE-J 合同公開報告会 2010.2.23

小児心停止症例の国際比較



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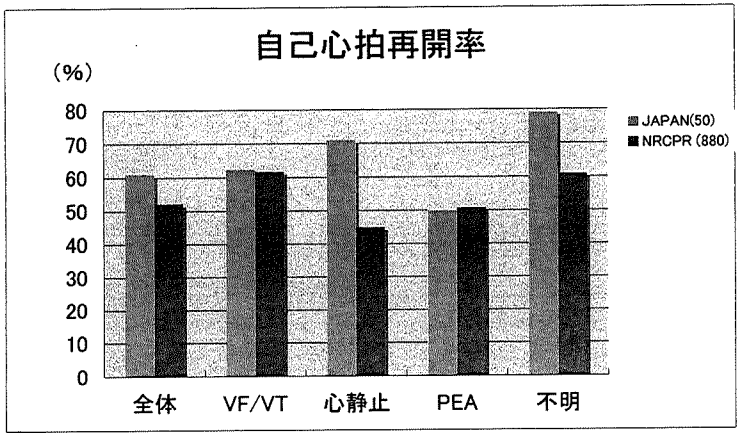

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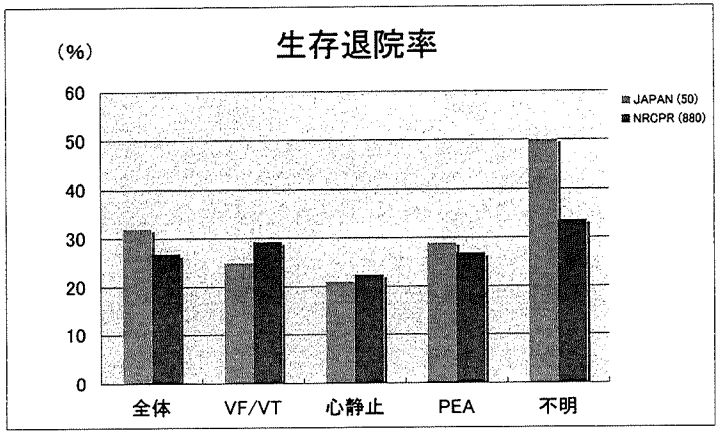

Nadkarni, et al, JAMA. 2006;295(1):50-70

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結語1

- 院内心停止登録システム(J-RCPR)に登録された成人と小児に関しての比較検討を行った
- 小児では、蘇生対象となる症例の約40%は “循環不全を伴う徐脈”であった
- 直接原因は、成人では、“不整脈”が最も頻度が高いのに対し、小児では、“低血圧”・“呼吸不全”がその主な原因であった
- 成人と小児では、心停止の原因およびその経過の違いが示唆され、小児においては心停止に至る前の徐脈の段階での介入がその予後を改善する可能性がある

Department of Emergency and general Pediatrics, Shizuoka Children's Hospital, Shizuoka, Japan

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結語2

- 小児蘇生においてはその症例ボリウムの少なさから国際協働が不可欠であり、NRCPRがその基盤となる
- 小児重症患者の症例登録の一環として、小児心肺蘇生レジストリをWebアプリ上で展開しうるインフラストラクチャを確立し、多施設からのデータ入力と解析を開始
- 今後はMET対応症例や呼吸不全症例の登録も視野に入れており、患者安全向上や病院危機管理において重要な情報源となりえ、科学的のみならず社会的にも重要なシステムである

Department of Emergency and general Pediatrics, Shizuoka Children's Hospital, Shizuoka, Japan

VI. J-PULSE II 資料

日本循環器学会資料

- J-Hypo
- J-RCPR

J-Hypo

抄録・スライド

Impact of Percutaneous Coronary Intervention and Mild Hypothermia therapy for Patients with out-of-hospital Cardiac Arrest of Acute Coronary Syndrome from Multicenter Hypothermia Registry in Japan.

Shinichi Shirai, M.D.[1], Masakiyo Nobuyoshi, M.D. [1], Kenji Ando, M.D. [1], Yoshimitsu Soga, M.D. [1], Kyohei Yamaji, M.D. [1], Katsuhiro Kondo, M.D. [1], Koyu Sakai, M.D. FACC [1], Takeshi Arita, M.D. [1], Masahiko Goya, M.D. [1], Masashi Iwabuchi, M.D. [1], Hiroyoshi Yokoi, M.D. [1], Hideyuki Nosaka, M.D. [1]Kokura Memorial Hospital

Ken Nagao, Nihon University

Naohiro Yonemoto, Hiroyuki Yokoyama, Hiroshi Nonogi, National Cardiovascular Center and J-PULSE-Hypo Investigators.

Object: The purpose of this study was to evaluate favorable neurological outcomes (cerebral performance category [CPC] 1 and 2) at 30 days for unconscious patients with ROSC after out-of hospital cardiac arrest. Method: Three years (2005-2007) data were available for the 281 patients treated with MH in the multicenter registry (12 institutions) of the J-PULSE-Hypo in Japan. Of those 122 were diagnosed as ACS by coronary angiography after ROSC (age 60+/-11, man 95%) and were treated with MH and PCI. IABP or PCPS were used in shock state. Result: Mean core temperature was 33.9 degrees C and mean cooling duration was 32 hours. Mean time interval from collapse to ROSC was 30min and IABP was used in 61.5% (N=75), and PCPS in 29.5% (N=36). Favorable outcome rate at 30 days was 52.3% (N=64, CPC 1=58), including 59.4% in Vf, 27.4% in PEA and 10.0% in asystole. In multivariate analysis, age, diabetes, and time interval from collapse to ROSC were the independent predictors of 30-day favorable outcome. Conclusion: MH with PCI for patients with ROSC after out-of-hospital cardiac arrest of ACS was effective for improvement of 30 days neurologic outcome even in the case of hemodynamic unstable and in any rhythm.

Key Word

Hypothermia, Acute coronary Syndrome, Percutaneous coronary intervention, Sudden cardiac death

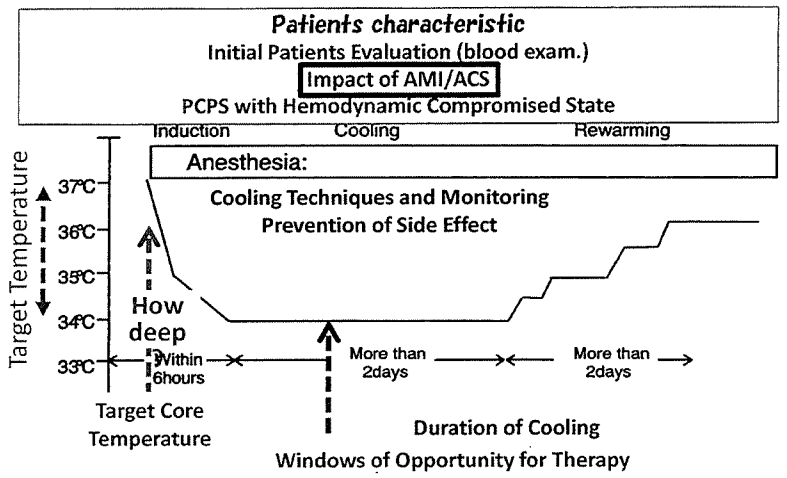
J-PULSE-Hypo registry: Mild Hypothermia Therapy for Acute Coronary Syndrome

Shinichi Shirai [1], M.D., Ken Nagao [2], M.D., Hiroshi Nonogi [3], M.D., Naohiro Yonemoto [3], M.D., Hiroyuki Yokoyama [3], M.D., Mamoru Hase [4], M.D., Yoshio Tahara [5], M.D., Kazunori Kashiwase [6], M.D., Yuji Yasuga [7], M.D., Hideki Arimoto [8], M.D., Soma Kazui [9], M.D., Hirotaka Sawano [10], M.D., Hiroshi Hazui [11], M.D., Takuro Hayashi [12], M.D., Eisuke Kagawa [13], M.D., Yasuhiro Kuroda [14], M.D., Yuichi Motomura [15], M.D., Shunji Kasaoka[16], M.D.

and for the J-PULSE Hypo registry Investigators.

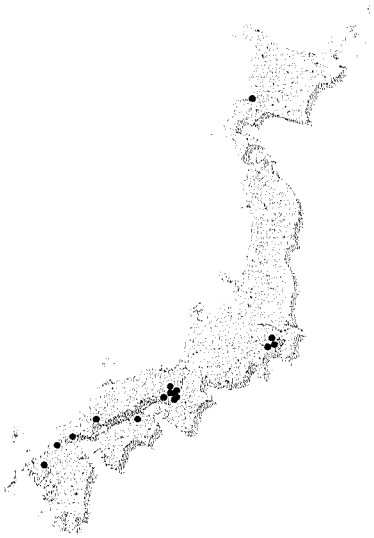
[1] Division of Cardiology, Kokura Memorial Hospital, [2] Division of Cardiology, Nihon University Surugadai Hospital, [3] Division of Cardiology National Cardiovascular Center, [4] Emergency and Critical Care Center, Sapporo City University Hospital, [5] Emergency and Critical Care Center, Yokohama City Hospital, [6] Division of Cardiology, Osaka Police Hospital, [7] Department of Cardiology, Sumitomo hospital, [8] Emergency and Critical Care Center, Osaka City Medical Center, [9] Emergency and Critical Care Center, Kitazato University Hospital, [10] Emergency and Critical Care Center, Saiseikai Senri Hospital, 11 Osaka Mishima Emergency Critical Care Center, [12] Emergency and Critical Care Center Kobe City Medical Center General Hospital, [13] Department of Cardiology, Hiroshima Municipal Hospital, [14] Emergency and Critical Care Center, Kagawa Univeristy Hospital, [15] Emergency and Critical Care Center, Saga University Hospital, [16] Advanced Medical Emergency and Critical Care Center, Yamaguchi University Hospital.

There are many unsolved questions in mild hypothermia therapy



Courtesy of Hiroyuki Yokoyama

J-PULSE Hypo registry



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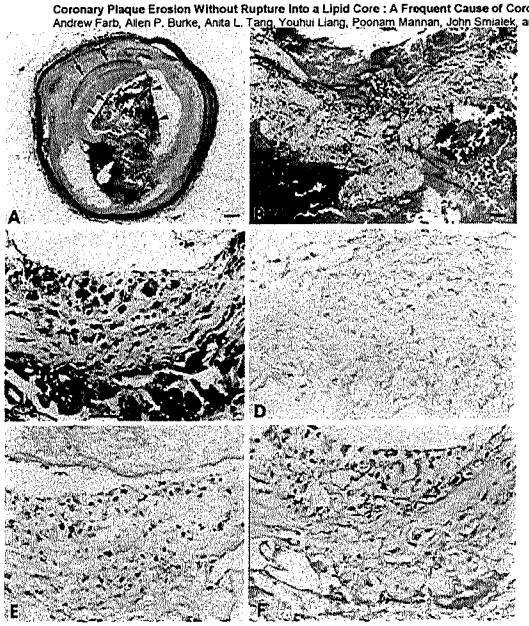
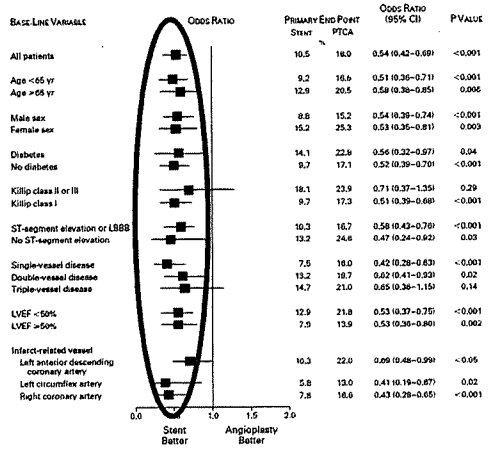


Acute thrombosis of the left anterior descending coronary artery was found in this 54-year-old man with witnessed cardiac arrest and death 2.5 hours after the onset of chest pain. A, Concentric plaque with a large hemorrhagic lipid core (L) and focal calcification (arrows) is seen at low power; an occlusive thrombus (arrowheads) is present. B, The platelet-rich thrombus (T) is adjacent to the rupture of the fibrous cap (high power). Immunohistochemical staining demonstrates abundant macrophages (in C), an absence of smooth muscle cells (in D), and scattered T cells (in E) with HLA-DR–positive macrophages and T cells (in F).

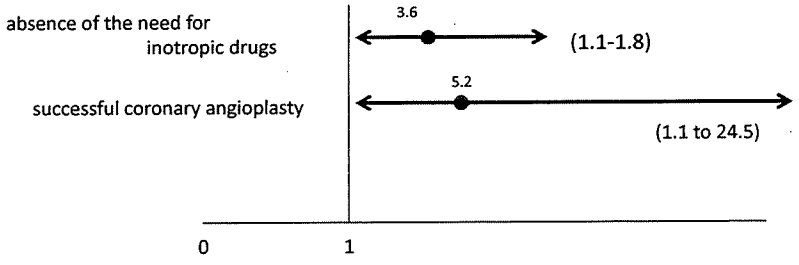
Circulation. 1996;93:1354-1363

COMPARISON OF ANGIOPLASTY WITH STENTING, WITH OR WITHOUT ABCIXIMAB, IN ACUTE MYOCARDIAL INFARCTION



N Engl J Med 2002;346:957-66.

IMMEDIATE CORONARY ANGIOGRAPHY IN SURVIVORS OF OUT-OF-HOSPITAL CARDIAC ARREST



Multivariate logistic-regression analysis revealed that successful angioplasty was an independent predictor of survival (odds ratio, 5.2; 95% C.I, 1.1 to 24.5; P=0.04)

N Engl J Med 1997;336:1629-33.

Acute coronary angiographic findings in survivors of out-of-hospital cardiac arrest

Characteristic	No significant CAD (n = 26)	Significant CAD (n = 46)	P	Total (n = 72)
Electrographic patterns on admission*				
ST-segment elevation	2 (7.7)	21 (45.7)	.0009	23 (31.9)
ST-segment depression	6 (230.)	15 (32.6)	.4	21 (29.2)
Left bundle branch block	4 (15.4)	8 (17.4)	1.0	12 (16.7)
Unspecific ST or T changes	8 (30.7)	4 (8.7)	.02	12 (16.7)
Normal	6 (23)	5 (10.9)	.2	11 (15.3)

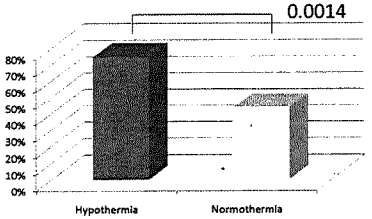
Pattern of ECG change immediately after ROSC.

ECG did not reflect the severity of coronary lesion.: in some cases, no significant change or normal pattern was found in the case of coronary block. Therefore, no ECG change immediately after ROSC could not conclude that the reason of cardiac arrest was due to the coronary ischemia.

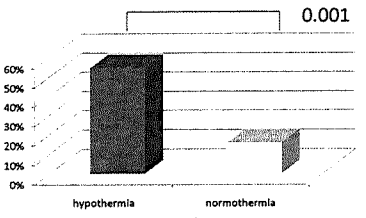
⇒Emergency coronary angiography immediately after ROSC should be performed to establish the adequate diagnosis and treatment in order to improve the prognosis

Am Heart J 2009;157:312-8.

Primary percutaneous coronary intervention and mild induced hypothermia in comatose survivors of ventricular fibrillation with ST-elevation acute myocardial infarction



In-hospital survival



Survival with CPC 1 or2

(Conclusion)

Our preliminary experience indicates that primary PCI and MIH are feasible and may be combined safely in comatose survivors of ventricular fibrillation with signs of STEMI. Such a strategy may improve survival with good neurological recovery.

Percutaneous coronary intervention with mild hypothermia therapy improved the neurologic outcomes for comatose survivors after cardiac arrest with ST-elevation myocardial infarction (STEMI).

However, this study was limited to the patients with STEMI and vetricularf ibrillation.

Resuscitation (2007) **74, 227—234**

Introduction

Resuscitated patients from sudden cardiac death (SCD) had a poor prognosis because of not only high mortality but also severe neurologic disability.

Ischemic heart disease was reported to be the main causes of SCD. Myocardial infarction was the main causes of SCD, therefore, emergency revascularization therapy might be the most effective for improving the mortality for the patients with cardiac arrest due to acute ischemic coronary artery disease, even without ST segment elevation in ECG.

For the patients with post cardiac arrest syndrome (PCAS), 'bundled' therapy was recommended, that is ,early coronary revascularization, temperature control was mandatory treatment strategy. Percutaneous coronary intervention (PCI) with mild hypothermia therapy (MHT) was effective for the cardiac arrest patients with ST elevation MI.

Intra-aortic balloon pumping (IABP) or percutaneous cardio-pulmonary support (PCPS) were used for the patients with compromised hemodynamic state at the discretion of the operator.

Cerebral performance category (CPC) with levels 1 (Normal mental performance), 2 (moderate disability), 3 (severe disability), 4 (vegetative state) was used at 30days. Favorable outcome was defined in CPC 1 or 2.

Methods

The exclusion of this study was 1) less than 15years old, 2) pregnant woman, 3) aortic dissection with or without cardiac tamponade 4) cerebral hemorrhage or subarachnoid hemorrhage, 5) known terminal disease.

Non-shockable rhythm such as asystole or pulseless electrical activity (PEA) and complicating cardiogenic shock were enrolled in this study. All of suspicious patients of acute coronary ischemic events or without clear etiology of arrest were transferred to catheter laboratory immediately after ROSC even without ST segment elevation in ECG and with compromised hemodynamic. If the thrombotic stenosis or occlusion was found in the culprit coronary artery, percutaneous coronary intervention was attempted, followed by stent implantation if needed.

End-point of this analysis

Primary endpoint of this study was to evaluate favorable neurological outcomes (cerebral performance category [CPC] 1 and 2) at 30 days for unconscious patients with ROSC after out-of hospital cardiac arrest.

Secondary Endpoint of this study was to predict the 30 days neurologic outcomes.