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연	월	일	시간	간호진단 (#) 및 목표	간호중재 및 평가 (간호활동)	해결일	서명
07	3	20	4:00		간호사인 방문후 순환기 시작 Arma 가시성 Audin massage 등 Ambuacc 시트 사용		
				1/4 hr Uncheck P-O (P-O) P-High BT 96.0 / checked	X-ray (Chest) 11/11		
				seen by P-물론일 담당 P-1000			
				ECG (A) vital observe / apical			



				cardiac massage by Arma logging P-O			
				data monitor work on fluid started at 10:00 AM applied (the face)			
				1AT 20 1epi 20 / 200 by 20 2 3400			
				2AT 20 1EPI 10 / 20 2000			
				by 10 20 2 3400			
				Lower collar minted (at formal)			
				by 20 2 3400			

연	월	일	시간	간호진단 (#) 및 목표	간호중재 및 평가 (간호활동)	해결일	서명
07	3	20	4:00		의 N 2000 2000 의 N 2000 2000 의 N 2000 2000		
				4:00	Cardiac massage Arma logging 기동 준비중		



				Lab checked			
				4000 by 10 20 2 3400			
				2AT by 10 20 2 3400			
				X-ray (pt) checked			
				Foley line inserted Cardiac massage			
				AT 20 2000			
				AT 20 2000			
				IMPT IOPN (100) with 2000 2000			

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- 10 (09:10AM),
(coma),
38 /
ambu bagging



- Atropine, Dopamine, Dobutamine
→ HR 137/min, BP 104/63mmHg

09:15AM



LVEF 35%, mid to apical anterior & anteroseptal wall hypokinesia

•10:15AM CCU

–Semi-comatous M/S, 100/60mmHg, 78/min, Ventilator

•19:00PM

–Stuporous M/S, 140/80mmHg 84/min

•22:00PM

–Drowsy M/S, 120/70mmHg, 71/min, Extubation

• 10

–Alert M/S, 95/50mmHg, 68/min

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- 50 - 80%
 - *Ischemic Heart Disease*
- 20 - 30%
 - *LV Dysfunction* from diverse etiology
- Others



Figure 1. Trend of Age-adjusted Mortality Rate for Cardiovascular Diseases among Men in Korea, 1983-2000

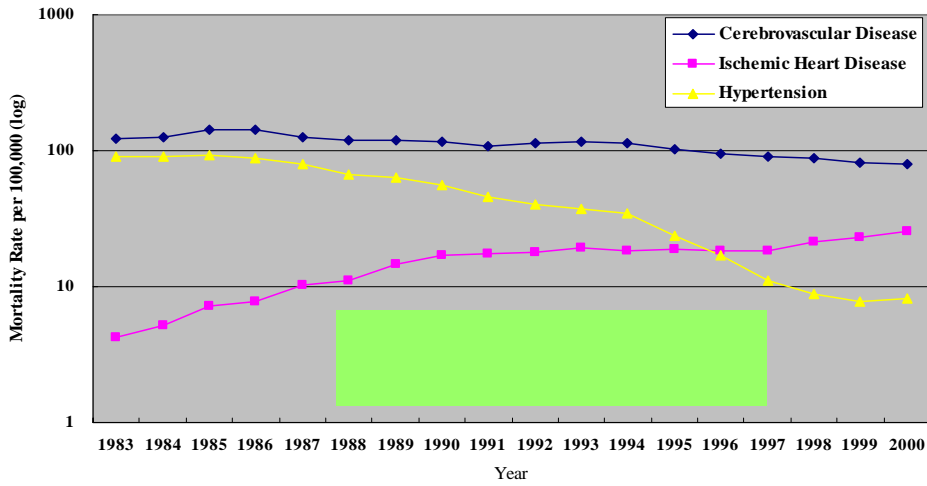
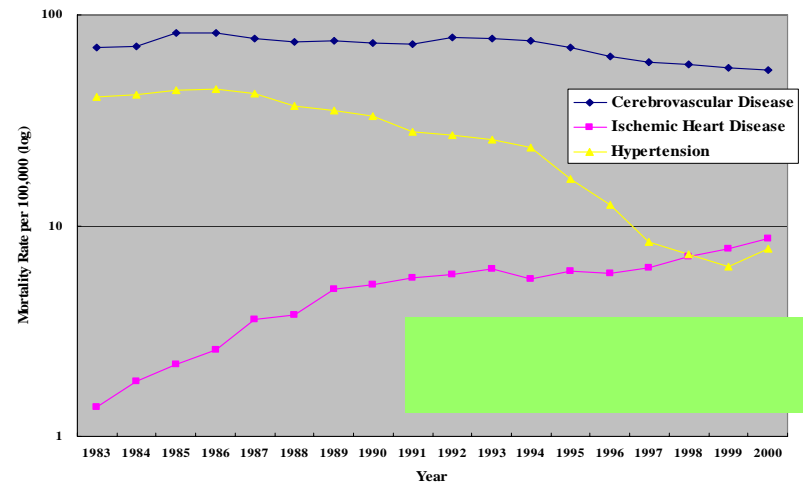


Figure 3. Trend of Age-adjusted Mortality Rate for Cardiovascular Diseases among Women in Korea, 1983-2000





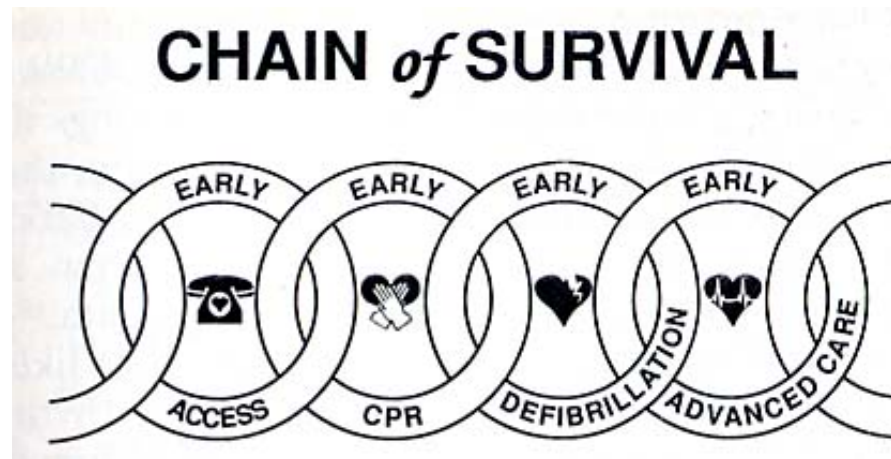
		()									
1989	188,993	36,595	25,780	15,838	3,259	3,022	12,062	11,083	3,757	12,977	1,652
1990	191,002	38,420	26,319	16,476	4,115	3,157	11,756	13,824	3,668	12,387	1,267
1991	199,673	38,351	26,463	17,905	4,526	3,066	11,743	13,936	4,209	10,906	1,079
1992	208,321	43,570	31,600	16,928	5,321	3,533	12,458	13,539	5,080	10,800	1,406
1993	217,154	46,532	34,727	17,785	6,864	4,123	13,211	13,879	6,519	11,325	1,749
1994	230,677	49,033	36,714	18,977	7,380	4,211	12,700	15,351	6,813	11,232	2,236
1995	238,132	50,107	36,061	16,682	7,789	4,840	13,323	17,497	6,763	8,276	2,400
1996	236,234	50,402	34,187	16,334	7,957	5,856	12,521	17,543	6,412	6,343	2,342
1997	238,714	52,187	33,845	16,476	8,684	6,022	12,017	15,414	6,281	4,444	2,406
1998	240,254	50,731	34,355	17,950	9,791	8,569	11,497	11,957	5,903	3,899	2,292
1999	246,539	54,090	34,410	18,451	10,296	7,075	11,080	12,387	6,465	3,568	2,618
2000	247,346	58,042	34,817	18,300	10,746	6,460	10,874	12,073	7,967	4,238	2,740
2001	242,730	59,119	35,354	16,375	11,403	6,933	10,654	10,033	9,112	4,875	2,768
2002	246,515	62,887	37,134	17,889	12,090	8,631	10,572	9,201	10,889	5,125	3,145
2003	245,817	63,685	36,495	17,188	12,100	10,932	9,934	9,224	9,213	5,149	3,519
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“Chain of Survival” concept

- “Rescue Chain”
t FW Ahnefeld of Ulm, Germany
in the early 1960s.



ECC : Emergency Cardiac Care

(Circulation 83;1832-47, 1991)



FIGURE 2. The AHA adult Chain of Survival. The 4 links or actions in the chain are (1) phone 911, (2) CPR, (3) early defibrillation, and (4) advanced care.



1. the 1st link : *Early Access*
2. the 2nd link : *Early CPR*
3. the 3rd link : *Early Defibrillation*
4. the 4th link : *Early Advanced Care*



Early Access

- Recognition of early *warning signs*, such as chest pain and shortness of breath, that encourages victims or rescuers to *call 119* before collapse
- Medical emergency is *recognized* and EMS *accessed* and *activated*

(EMS : Emergency Medical Service)



Early CPR

- **Bystander CPR** *by layperson*
- Community - based CPR training programs
 - AHA, ARC: American Red Cross
 - 20% of adult population
- Targeted CPR training
- Dispatcher - assisted CPR instruction programs



Survival(Discharge Alive) from Out - of - Hospital Cardiac Arrest

	<i>Bystander CPR</i>	<i>Late CPR</i>	<i>Odds ratio</i>
<i>Oslo</i>	36%(27/75)	8%(43/556)	6.7
<i>Birmingham</i>	86%(6/7)	50%(6/12)	6.0
<i>Seattle</i>	43%(47/109)	21%(43/207)	2.9
<i>Winnipeg</i>	25%(16/65)		6.2
<i>Iceland</i>	42%(16/38)	2%(2/84)	11.5
<i>Vancouver</i>	21%(9/43)		4.0
<i>Los Angeles</i>	22%(20/93)	5%(7/150)	5.6
<i>Pittsburgh</i>	24%(6/25)	7%((4/59)	4.3
<i>Milwaukee</i>	15%(182/1248)	15%(38/252)	<u>1.0</u>
<i>Tucson</i>	20%(13/65)	9%(12/130)	2.5
<i>Belgium</i>	10%(98/985)	5%(109/2036)	1.9
<i>Houston</i>	30%(16/53)	14%(19/133)	2.1



Neurologic outcome of SCD

(Effect of *Bystander CPR*)

	<i>With</i>	<i>No</i>	P
Purposeful Activity (at Admission)	18/36(50%)	5/82(6%)	<0.001
Conscious by 24 hrs	22/36(61%)	7/82(9%)	<0.001
Confused at discharge	1/27(4%)	18/38(47%)	<0.001
Vegetative state at discharge	0	3/38(8%)	<0.001

(Cobb LA et al. Ann NY Acad Sci 382:330-42,1982)



Early CPR

- Bystander CPR *by layperson*
- **Community-based CPR training programs**
 - AHA, ARC: American Red Cross
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(ECG)



10mmV

AP

75

(Arterial Pressure)

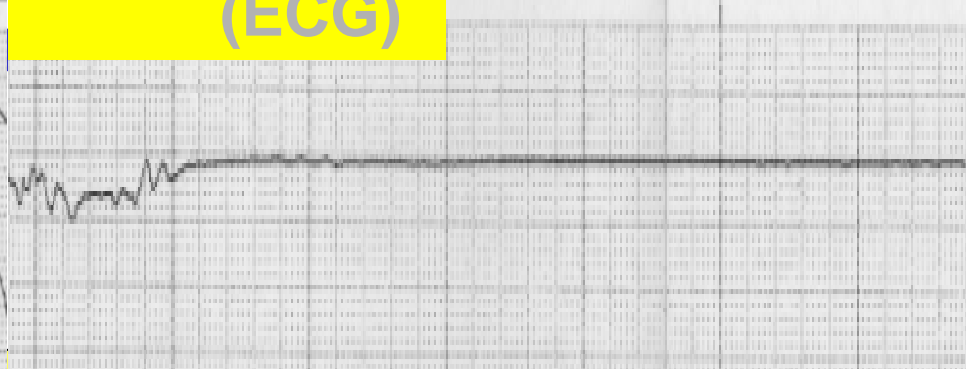
80mmHg

PA

75

(VF:
Ventricular
Fibrillation)

(ECG)

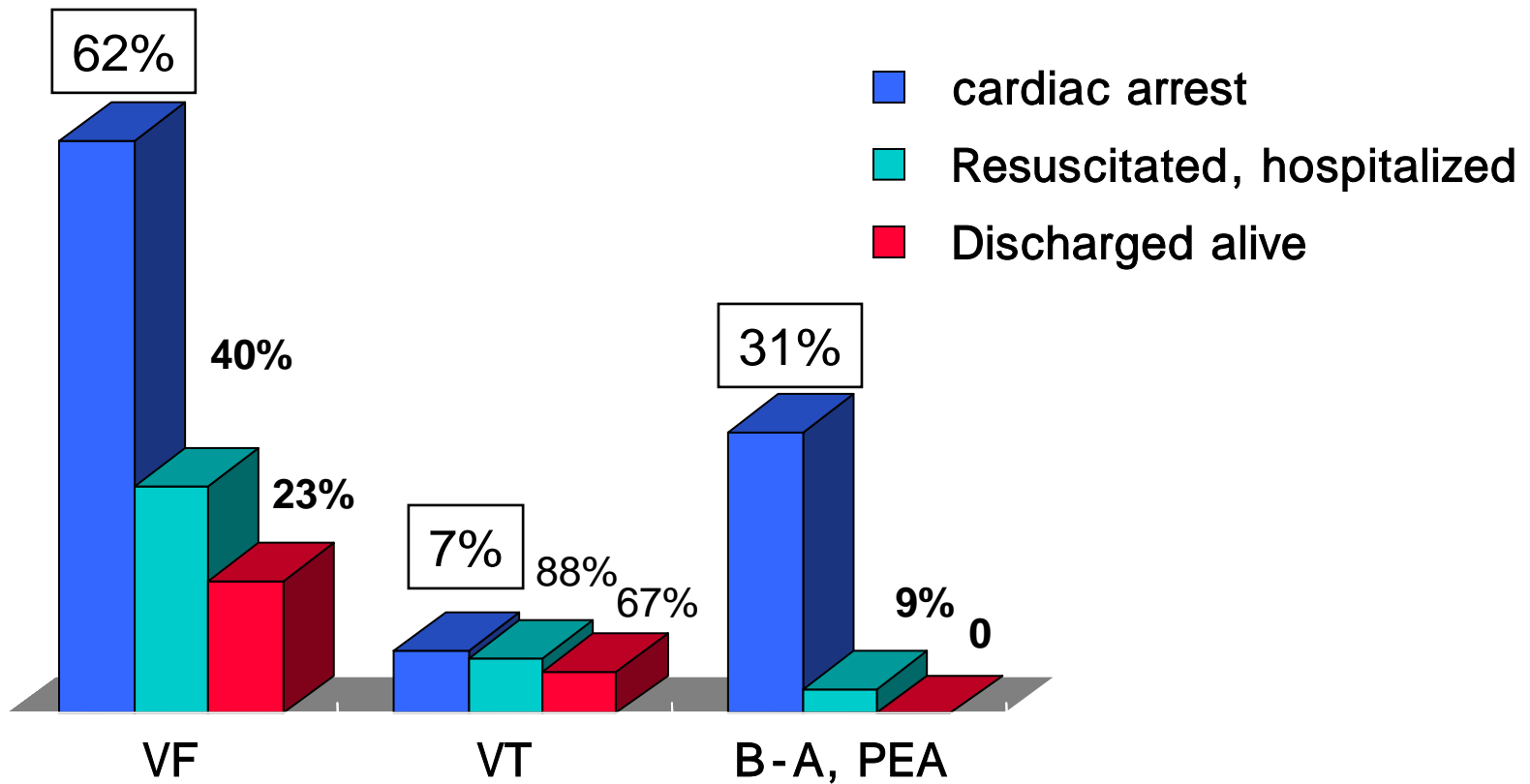


(Arterial Pressure)

(Asystole)



Survival after out-of-hospital cardiac arrest





Initial ECG finding (VT/VF)

<i>Bystander-CPR</i>	<i>with</i>	<i>without</i>
King county	80%	68%
Stockholm	67%	45%
Belgium	42%	29%



(Full recovery/Survival Rate) after SCD

- USA : About 5%
- Western Europe : < 5%
- Others (S. Korea) : < 1%



Early Defibrillation

- Time to defibrillation
(the interval between collapse and defibrillation)

FIGURE 2. The AHA adult Chain of Survival. The 4 links or actions in the chain are (1) phone 911, (2) CPR, (3) early defibrillation, and (4) advanced care.





*Effectiveness of **Early Defibrillation Programs** : Survival From Ventricular Fibrillation*

Location	Before early defibrillation	After early defibrillation	Odds ratio for improved survival*
King County ⁸⁸	7% (4/56)	26% (10/38)	4.6
Iowa ⁹⁰	3% (1/31)	19% (12/64)	6.9
Southeastern Minnesota ¹¹⁹	4% (1/27)	17% (6/36)	5.2
Northeastern Minnesota ⁷⁷	3% (3/118)	10% (8/81)	4.2
Wisconsin ¹²²	4% (32/893)	11% (33/304)	3.3

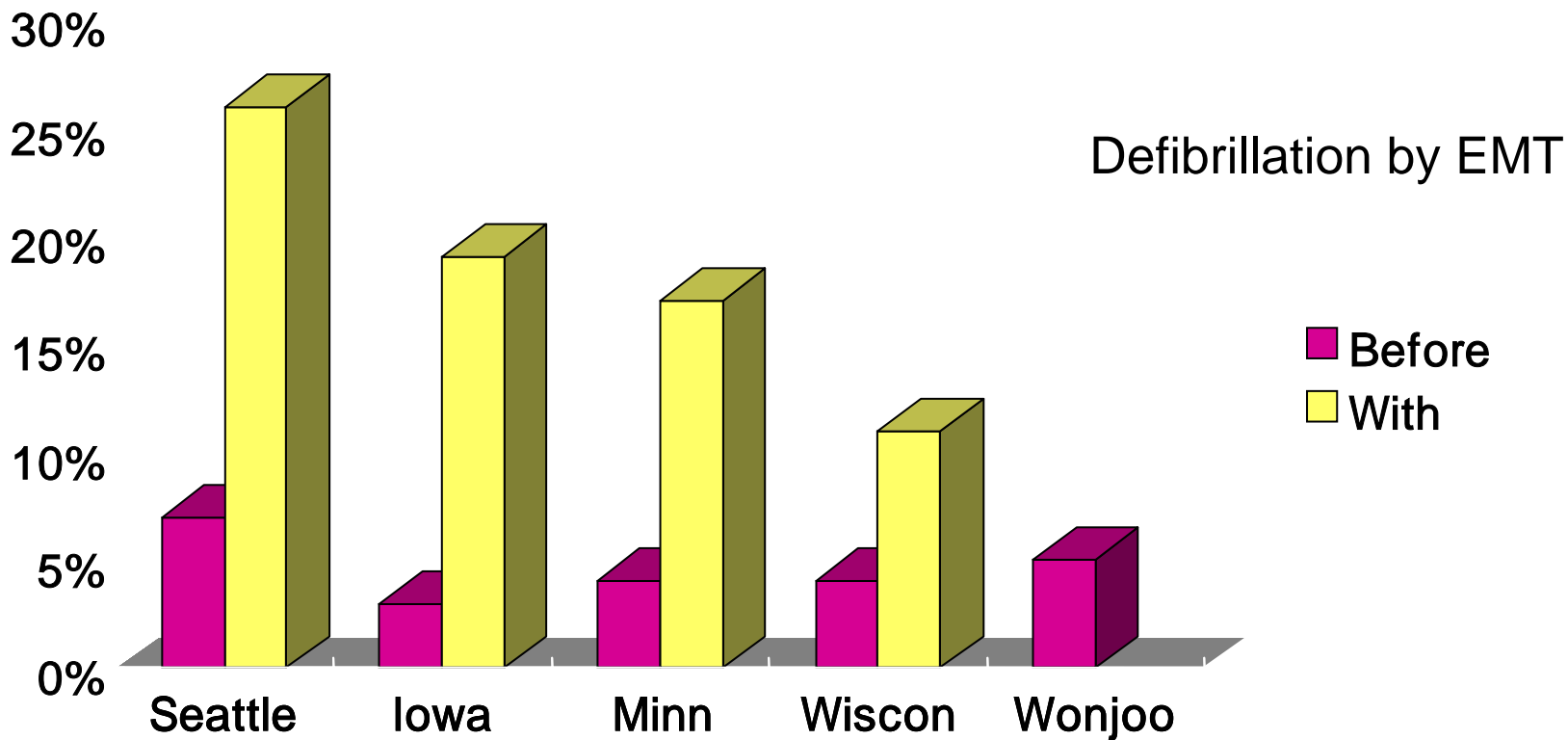
*The odds ratio is not a simple ratio of survival rates. It is calculated as the odds of surviving after an early defibrillation program (number who live divided by number who die), divided by the odds of surviving before an early defibrillation program (number who live divided by number who die).

Defibrillation by first responder (EMS Personnel)

(Ann Emerg Med 18;1269-1275, 1989)

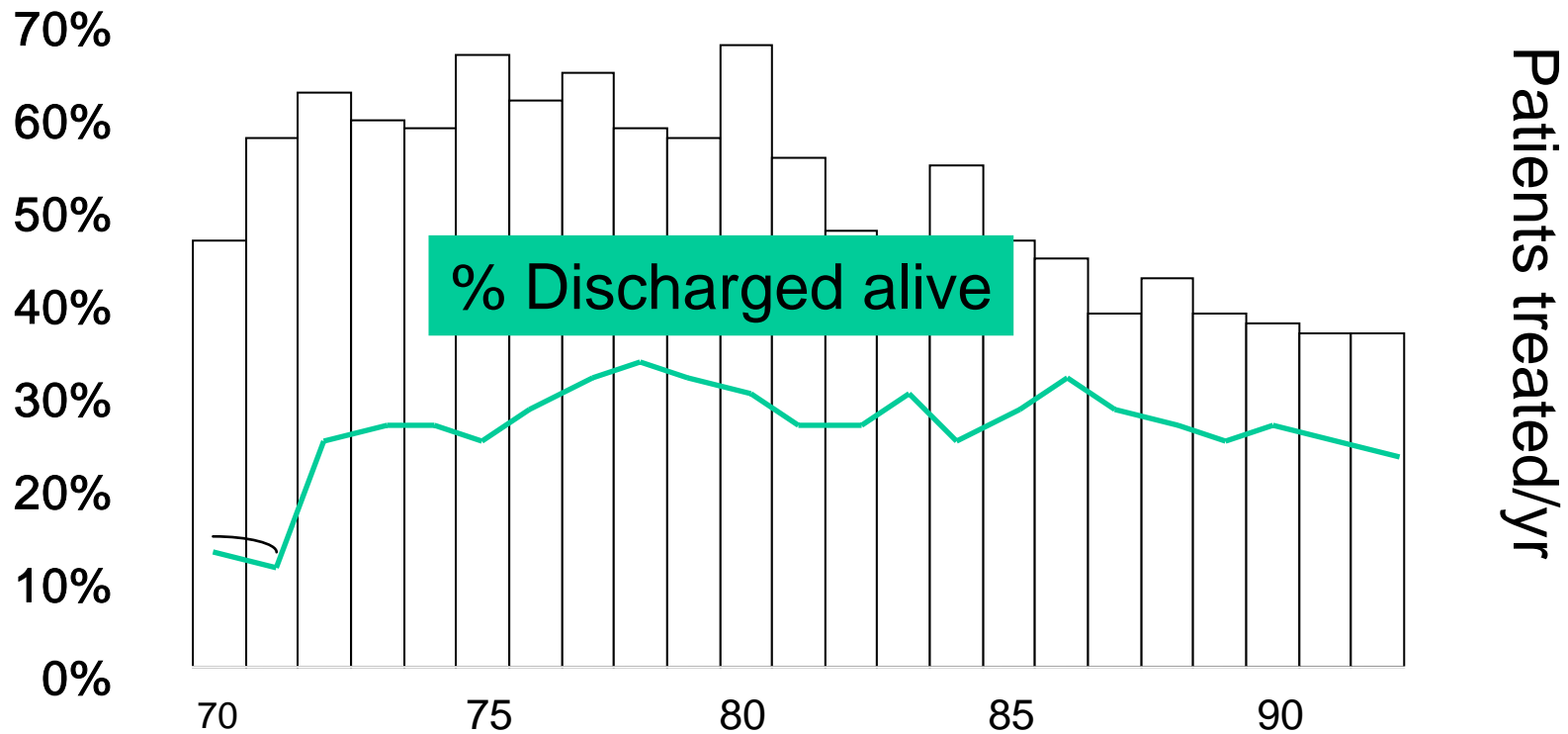


VF Survival





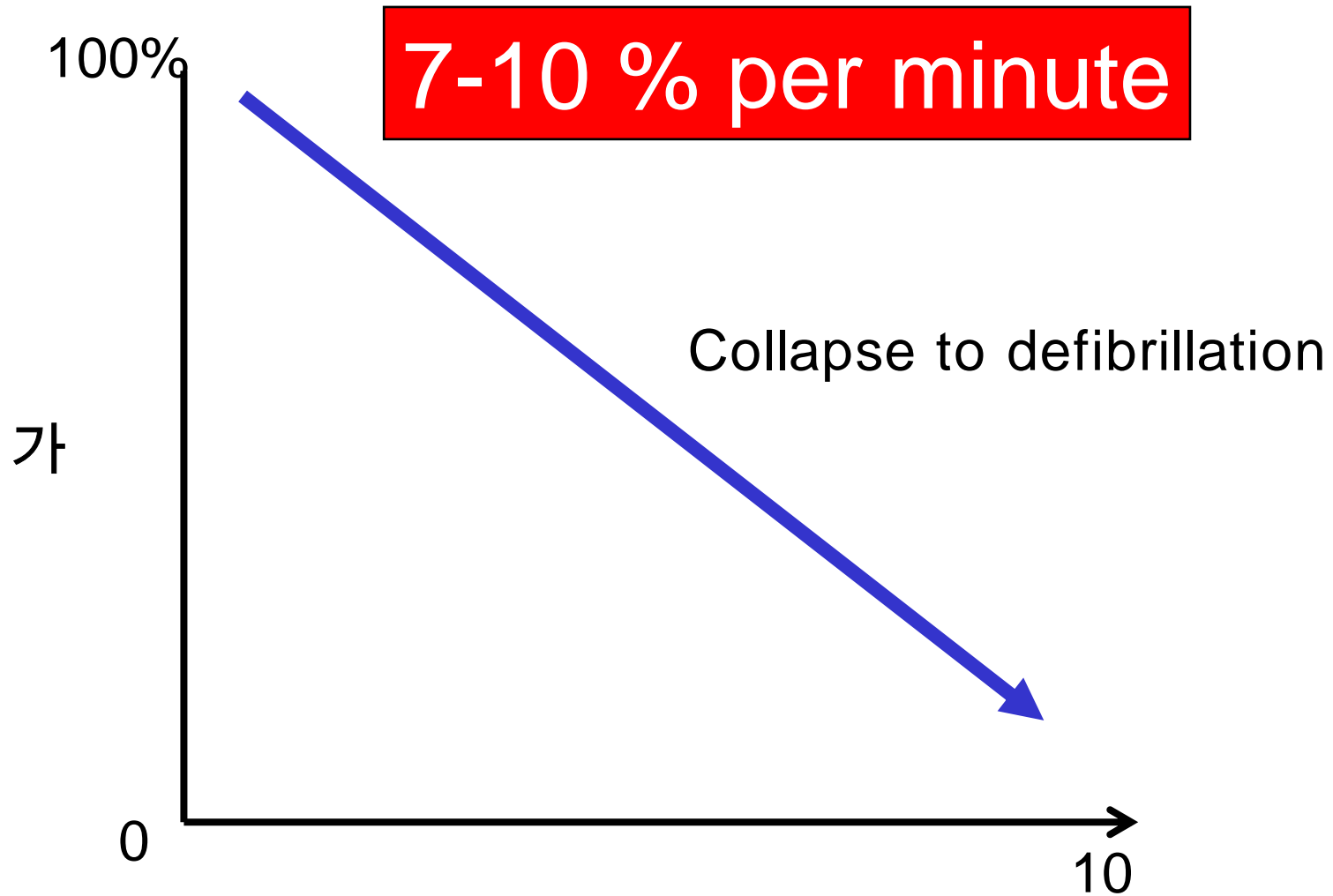
VF in Seattle



Defibrillation by EMT (1st responder)



Probability of survival to hospital discharge after VF cardiac arrest



(Ann Emerg Med 22;1652-1658, 1993)

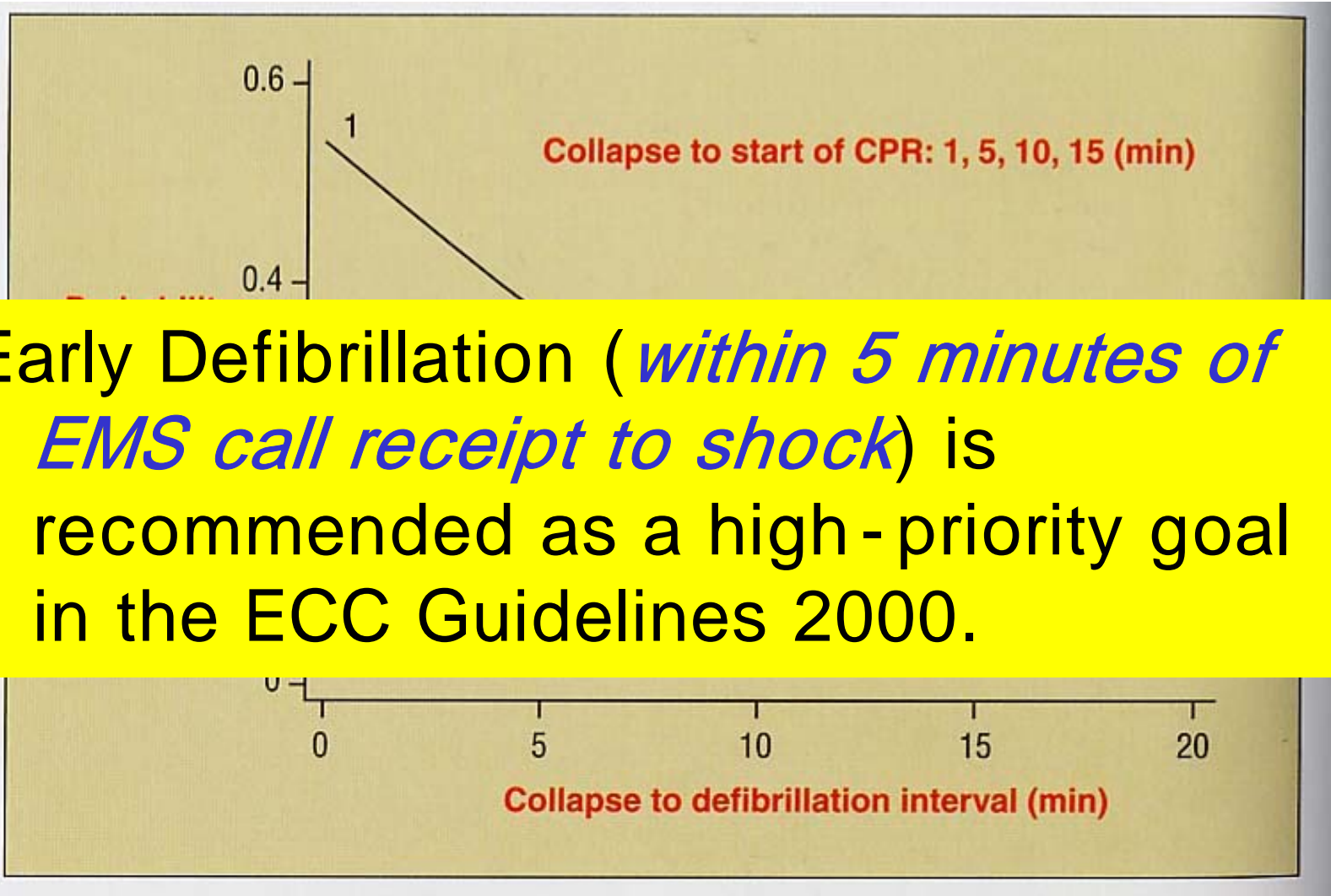


Early Defibrillation

<i>Collapse - to - Defibrillation time</i>	<i>Survival Rate</i>
< 1min	70 - 90%*
< 5min	50%+
7 min	30%
9 - 11 min	10%
>12 min	2 - 5%

* : Outpatient cardiac rehabilitation unit

+ : Witnessed collapse, early CPR and early Defibrillation by police, on airplanes and in airports and in casino.



Early Defibrillation (*within 5 minutes of EMS call receipt to shock*) is recommended as a high-priority goal in the ECC Guidelines 2000.

Early bystander CPR and *Early PAD*(Defibrillation)



the Early Defibrillation link

- AEDs used by the first responding emergency personnel
- **AEDs used by community responders**
- Home defibrillation

(Circulation 83;1832-47, 1991)



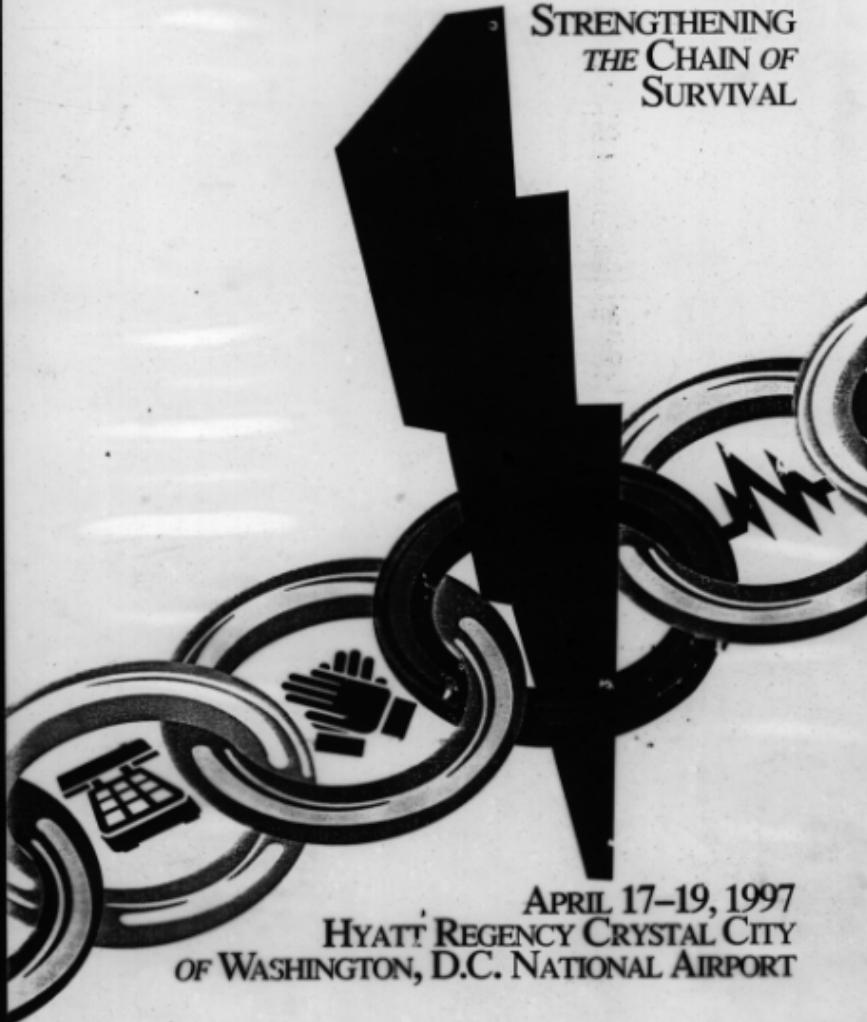
Public Access Defibrillation (PAD)

- *In October 1993*, AHA appointed the Task Force on AED(Automatic External Defibrillation)
- *In December 1994*, a conference on PAD (Washington, DC)
- *1 November 1995*, A statement for Healthcare Professionals from AHA Task Force on AED

American Heart
AssociationSM
Fighting Heart Disease
and Stroke

*public access
defibrillation II*

STRENGTHENING
THE CHAIN OF
SURVIVAL



APRIL 17-19, 1997
HYATT REGENCY CRYSTAL CITY
OF WASHINGTON, D.C. NATIONAL AIRPORT

AED (Automatic
External Defibrillator)
for population



ICD for patient



PAD trial

- A randomized, prospective, community-based, multi-center clinical trial
- 19,000 volunteer responders from 993 community units in 24 North American regions
- 70% in a public location, 72% witnessed
- Lay volunteers *trained in CPR alone* or *in CPR and the use of AEDs*

(N Engl J Med 351; 637-646, 2004)



Table 5. Number of Survivors of Out-of-Hospital Cardiac Arrest.

Characteristic	CPR Only	CPR plus AED	P Value	
			Unadjusted	Adjusted
Definite cardiac arrests — no.	107	128	0.09*	

- ↑

Trained volunteers can use AEDs *safely* and *effectively* in a variety of *public location*

Characteristic	CPR Only	CPR plus AED	P Value
Cerebral performance category of survivors of definite arrest — no. (%)			0.90¶
Normal	10 (71.4)	22 (73.3)	
Mildly impaired	3 (21.4)	5 (16.7)	
Moderately impaired	1 (7.1)	3 (10.0)	

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(N Engl J Med 351; 637-646, 2004)



PAD

(Public Access Defibrillation)

- The placement of AEDs in the hands of large numbers of trained rescuers may be the key intervention for increasing survival from out-of-hospital cardiac arrest



PAD

- “Good Samaritan” coverage
- Enact **facilitating legislation** to permit and encourage the use of AEDs by the lay public
- **The Cardiac Arrest Survival Act** provides immunity for lay rescuers who use AEDs and for businesses or other entities or individuals who purchase AEDs for public access defibrillation



CPR

BLS

ALS

- Respiration

Ambu/

- Circulation

External cardiac massage
Defibrillation(AED)

IV access/Drug

AED : Automatic External Defibrillator



Early Advanced Care(ACLS)

FIGURE 2. The AHA adult Chain of Survival. The 4 links or actions in the chain are (1) phone 911, (2) CPR, (3) early defibrillation, and (4) advanced care.



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OPALS trial

(the Ontario Pre-hospital Advanced Life Support Study)

- Multi-center, controlled clinical trial
- 17 cities before and after ALS programs were instituted, enrolled 5638 patients who had had cardiac arrest outside the hospital (enrolled during the rapid-defibrillation phase and the subsequent ALS phase, 1391 vs 4247)
- *The rate of admission to hospital* increased (10.9% vs 14.6%, $P < 0.001$), but *the rate of survival to hospital discharge* did not (5.5% vs 5.1%, $P = 0.83$)

(N Engl J Med 351;647-656, 2004)

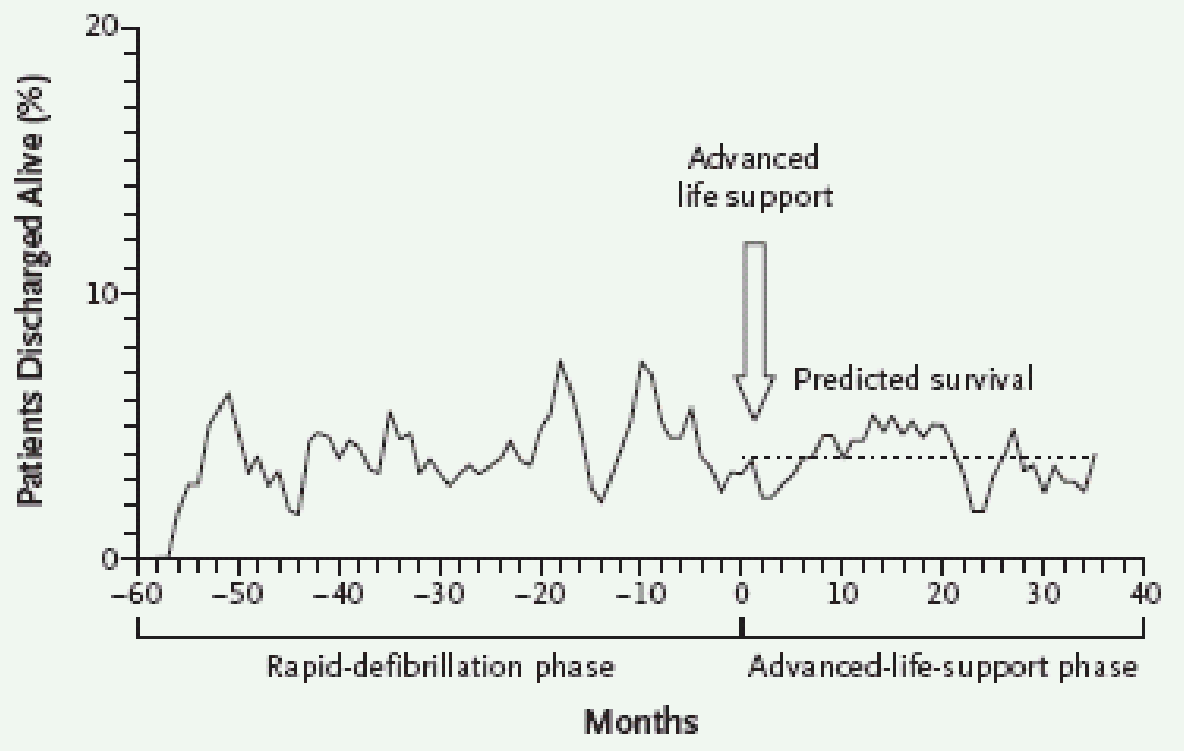


OPALS

Survival and Functional Outcomes of Patients from the Two Study Phases

Outcome	<i>Rapid-Defibrillation Phase</i> (N=1391)	<i>ALS Phase</i> (N=4247)	Absolute Increase (95% CI)	P Value
	<i>no. (%)</i>		<i>percentage points</i>	
Return of spontaneous circulation	180 (12.9)	766 (18.0)	5.1 (3.0 to 7.2)	<0.001
Admission to hospital	152 (10.9)	621 (14.6)	3.7 (1.7 to 5.7)	<0.001
Survival to hospital discharge	69 (5.0)	217 (5.1)	0.1 (-1.2 to 1.5)	0.83
Survivors' cerebral performance category, level 1†	54 (78.3)	145 (66.8)	—	0.73
		<i>score</i>		
Survivors' Health Utility Index, Mark III, at one year			—	0.67
Median	0.84	0.79		
Interquartile range	0.49–0.97	0.43–0.91		

† There were 69 survivors in the rapid-defibrillation phase, and 217 in the advanced-life-support phase.



Variable

Adjusted Odds Ratio (95% CI)

Age <75 yr		1.6 (1.2–2.3)
<u>First link: early access by bystander</u>		4.4 (3.1–6.4)
<u>Second link: early CPR by bystander</u>		3.7 (2.5–5.4)
<u>Third link: defibrillation in ≤ 8 min</u>		3.4 (1.4–8.4)
<u>Fourth link: advanced life support</u>		1.1 (0.8–1.5)

0.1

1.0

10.0



EMS System Evaluation

Utstein style

- Out-of-hospital (Circulation 84;960-975, 1991)
- In-hospital (Circulation 95;2213-2239, 1997)

The Survival-to-Discharge rate

- the gold standard for assessing the effectiveness of the treatment of cardiac arrest



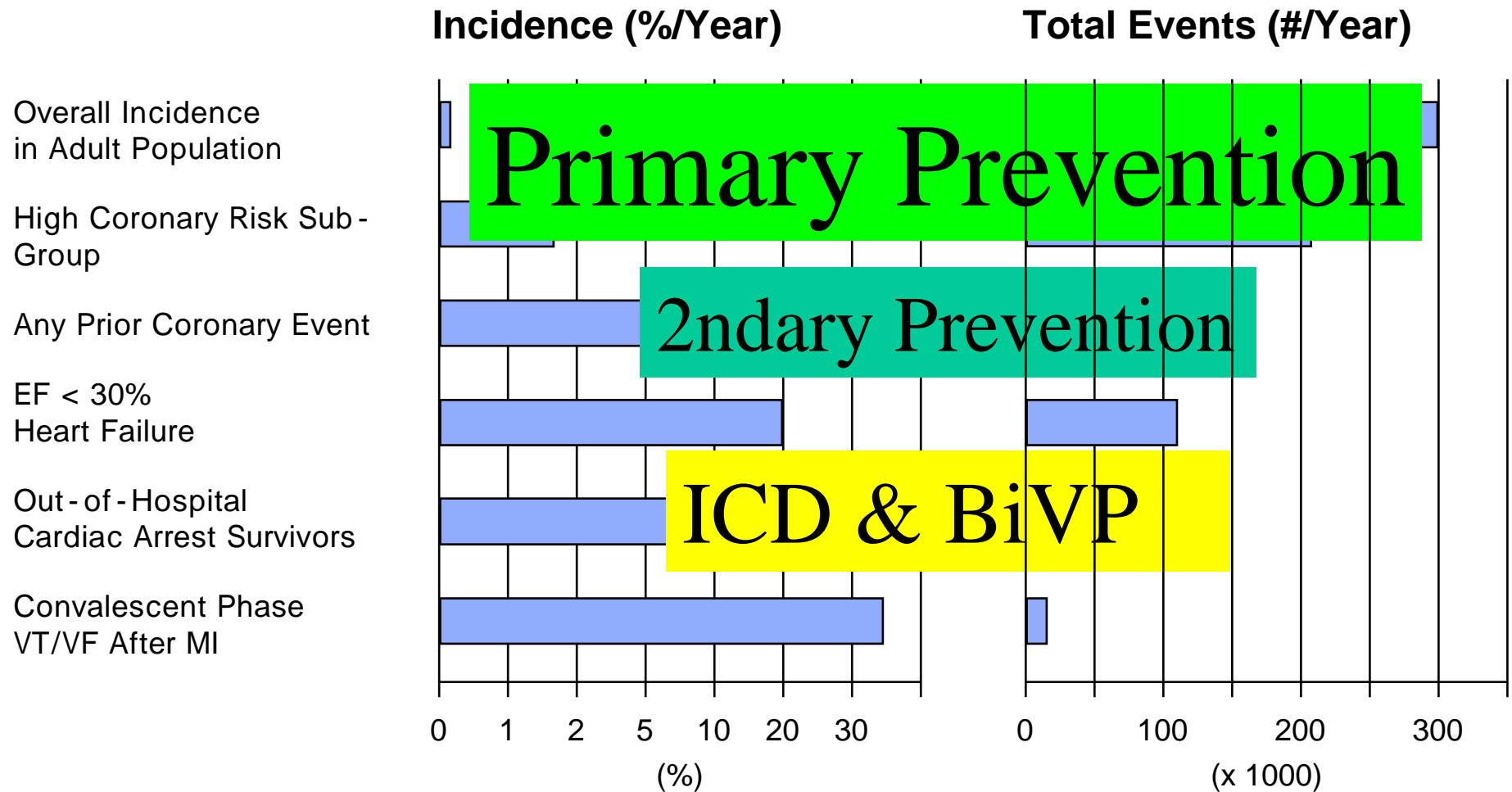
Emergency Cardiovascular Care (ECC)

- BLS (Basic Life Support)
- ACLS (Advanced Cardiovascular Life Support)
- EMS (Emergency Medical Service)

*Emergency transportation **without life support** is **not** emergency cardiovascular care(ECC)*



Sudden Cardiac Arrest (Incidence and Total Events)





“The Community as the Ultimate Coronary Care Unit”

ECC in Evolution

- CCU
- Paramedic
- Layperson

CHD Prevention in Parallel with ECC



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FIGURE 2. The AHA adult Chain of Survival. The 4 links or actions in the chain are (1) phone 911, (2) CPR, (3) early defibrillation, and (4) advanced care.





History of CPR/ECC

- 1950s Emergency thoracotomy with "open chest massage"
- 1956 Electrical reversal of ventricular fibrillation by externally applied electrodes
- 1958 Adequate rescue ventilation with mouth-to-mouth technique
- 1960 "closed chest" compression

- 1966 National Academy of Science-National Research Council(NAS-NRC) conference
- 1974 Standards and Guidelines of CPR and ECC
- 1980, 1986, 1992 revised
- 1997 ILCOR(International Liaison Committee on Resuscitation) Advisory Statement
- 2000 International CPR Guideline 2000

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대한심폐소생협회
Korean Association of CardioPulmonary Resuscitations



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(CPR Guideline 2000)

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AHA Instuctor Course