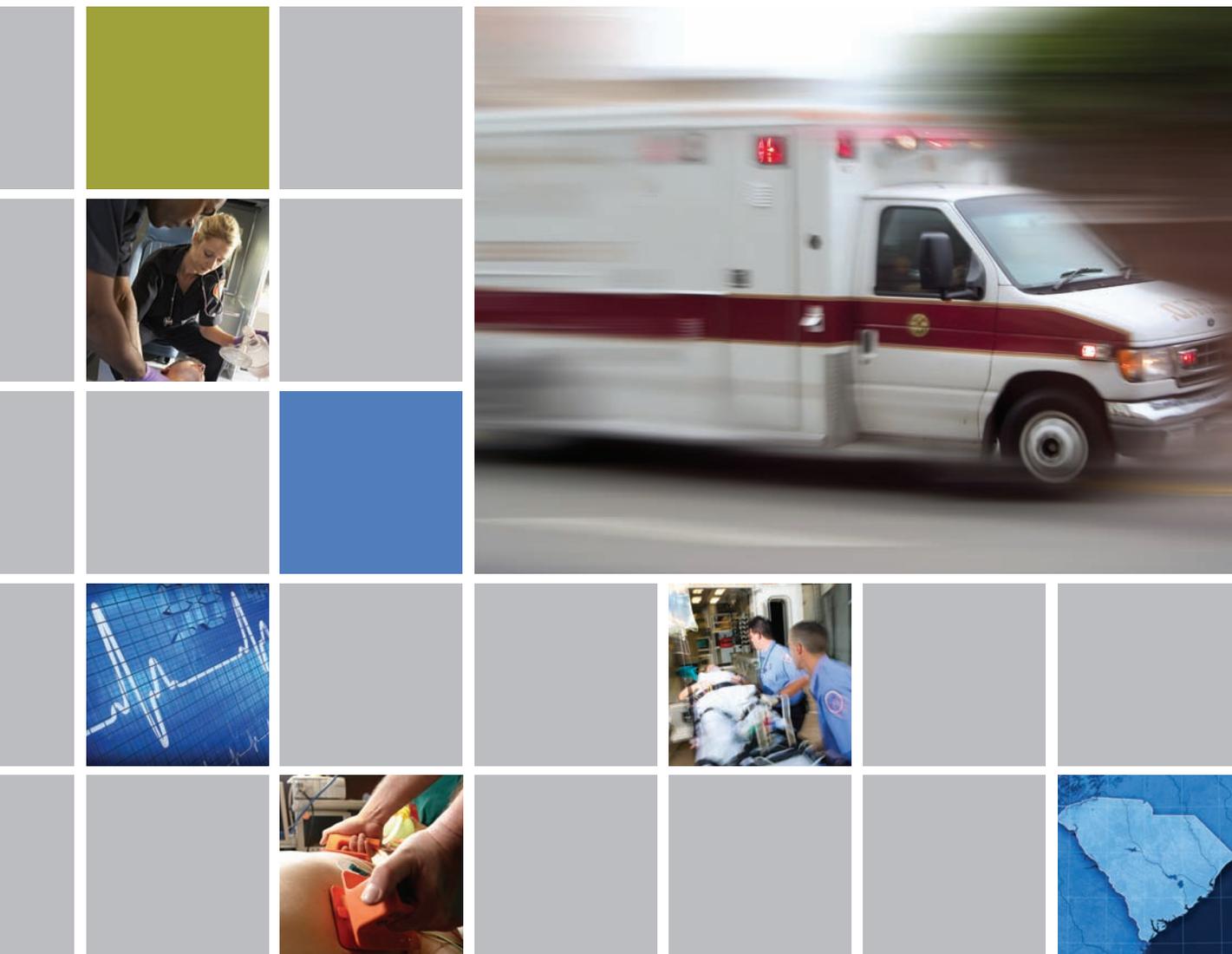


Survey of EMS Practices for Heart Disease and Stroke

South Carolina Summary of Results



Survey of EMS Practices for Heart Disease and Stroke: Summary of Results

Background

Heart and stroke-related deaths are, respectively, the first and fourth leading causes of mortality in the United States and major causes of disability. The most current comprehensive statistics on cardiovascular disease from the American Heart Association, published in February 2011, show that an estimated 82,600,000 American adults (1 in 3) have one or more types of cardiovascular disease. It is estimated that approximately 1,255,000 heart attacks and 795,000 strokes will occur in 2011. Also, statistics show that approximately 1 in 6 deaths are due to coronary heart disease (the most common type of heart disease) and 1 in 18 deaths are due to stroke.¹

Approximately half of heart- and stroke-related deaths² occur before a patient arrives at a hospital, underscoring the important role of pre-hospital emergency medical care in the “chain of survival” for heart attack and stroke. The statistics for cardiac arrest are difficult to pinpoint, but the best estimates are a survival rate of just 7.6%.³ Time to treatment is critical for these patients, and rapid emergency medical services (EMS) response, intervention, and transport to specialized medical facilities is essential for positive patient outcomes. The Institute of Medicine has noted, however, that across the United States, the delivery of emergency care across the health care system is fragmented, which could influence timeliness and quality of care provided for cardiovascular-related emergencies.⁴

Survey Objectives

In light of the important role of pre-hospital care in the treatment of heart and stroke events, the Division for Heart Disease and Stroke Prevention (DHDSP) at the Centers for Disease Control and Prevention (CDC) conducted a survey of state and

local EMS managers to better understand EMS capacity for emergency care of acute cardiovascular events. DHDSP developed this survey as part of its mission to increase early detection and treatment of heart disease and stroke, promote coordinated systems of care policies, enhance collaboration between CDC and state and local agencies, and identify at-risk populations to help eliminate disparities. The survey also serves to inform CDC programs in their designated role to support EMS through the Federal Interagency Committee on EMS (FICEMS).

Survey Response Rates for the 9 Participating States

State	Percent Responded
Florida	76.7
Massachusetts	74.8
Kansas	71.1
Montana	69.8
New Mexico	50.2
Wisconsin	67.6
Oregon	71.7
South Carolina	57.4
Arkansas	60.9

EMS Agency Personnel*

	South Carolina			All 9 States		
	Total	Min [†]	Max [‡]	Total	Min [†]	Max [‡]
Volunteer Staff						
EMT-Basic	324	0	30	8,514	0	100
EMT-Intermediate	107	0	12	2,520	0	60
EMT-Paramedic	133	0	15	934	0	50
Paid Staff						
EMT-Basic	890.1	0	100	14,769.6	0	100
EMT-Intermediate	379.5	0	35	3,139.3	0	75
EMT-Paramedic	1,220.4	0	100	16,159.9	0	100

* Source: Survey of EMS Practices for Heart Disease and Stroke, 2008.

† The smallest number of staff reported from a single agency.

‡ The largest number of staff reported from a single agency.

EMS Agency Call Volume*

	South Carolina			All 9 States		
	Total	Min [†]	Max [‡]	Total	Min [†]	Max [‡]
Total non-fire	479,703	3	65,000	4,749,605	1	130,000
Chest pain	47,098	0	6,000	453,831	0	25,200
Cardiac arrest	5,613	0	960	58,703	0	2,400
Stroke	17,799	0	3,000	143,711	0	9,600

* Source: Survey of EMS Practices for Heart Disease and Stroke, 2008. Results reported are approximate numbers. When respondents reported a range for the number of received calls, an average of the two numbers was reported.

† The smallest number of calls reported from a single agency.

‡ The largest number of calls reported from a single agency.

Survey Description

The survey consisted of 46 questions covering location and characteristics of the service area; basic descriptive information, such as EMS capacity, service levels, and types of care provided; medical direction; heart attack and stroke patient encounters; and transportation protocols. Also included was a list of 18 medical interventions (i.e., medications, devices, and procedures) relevant to emergency medical care for out-of-hospital cardiovascular crises.

The computer-assisted standardized telephone survey was administered by trained interviewers to 1,292 ground-based emergency care agency supervisors in nine states (Florida, Massachusetts, Kansas, Montana, New Mexico, Wisconsin, Oregon, South Carolina, and Arkansas). The response rate for each state ranged from 50.2% to 76.7%. The survey was designed by a team of researchers based on

literature reviews and recommendations of a panel of emergency care experts to devise a set of questions relevant to assessing cardiovascular emergency care capabilities.

Results

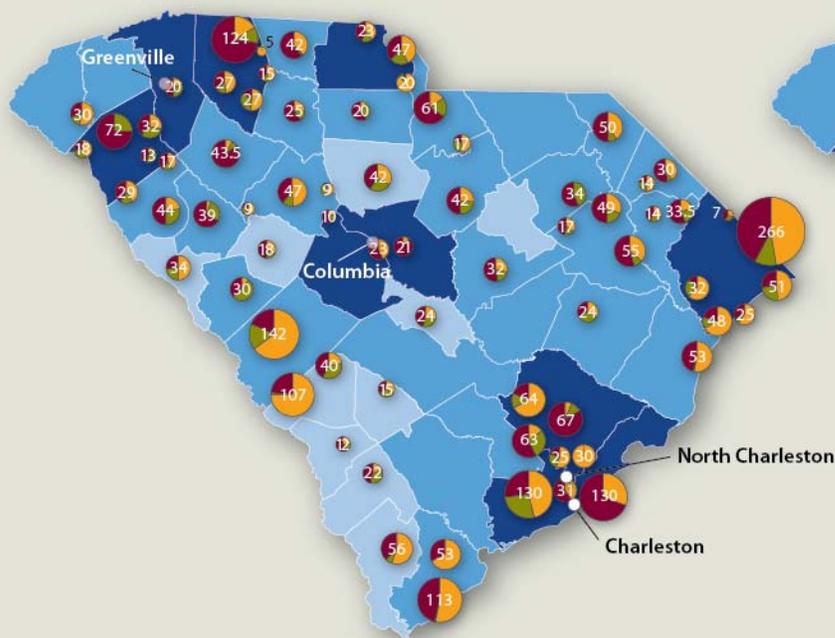
There are nine separate state summaries—one for each of the states that participated in the survey. Each state summary report provides an overview of the state-specific results and comparison data for all nine states combined. The tables and maps in this summary are survey results from participating EMS agencies in South Carolina.

These data will be useful for state and local EMS agencies and policymakers to provide a snapshot of heart- and stroke-related emergency response policies and personnel capabilities as well as highlight the importance of these policies for providing care to residents. These data also will provide

a useful planning resource for state and local EMS providers and serve as the basis for continued dialogue with CDC to help the agency better understand the critical care challenges that face EMS and identify ways that CDC can support emergency response for cardiovascular disease.

1. Roger VL, Go AS, Lloyd-Jones DM, et al. Heart disease and stroke statistics—2011 update. A report from the American Heart Association. *Circulation*. 2011;123:e18–e209.
2. Centers for Disease Control and Prevention. State specific mortality from sudden cardiac death: United States, 1999. *MMWR*. 2002;51(6):123–126.
3. Sasson C, Rogers MA, Dahl J, Kellerman AL. Predictors of survival from out-of-hospital cardiac arrest: A systematic review and meta-analysis. *Circ Cardiovasc Qual Outcomes*. 2010;3:63–81.
4. Institute of Medicine, Committee on the Future of Emergency Care in the United States Health System. *Emergency Medical Services: At the Crossroads*. Washington, DC: National Academies Press; 2007.

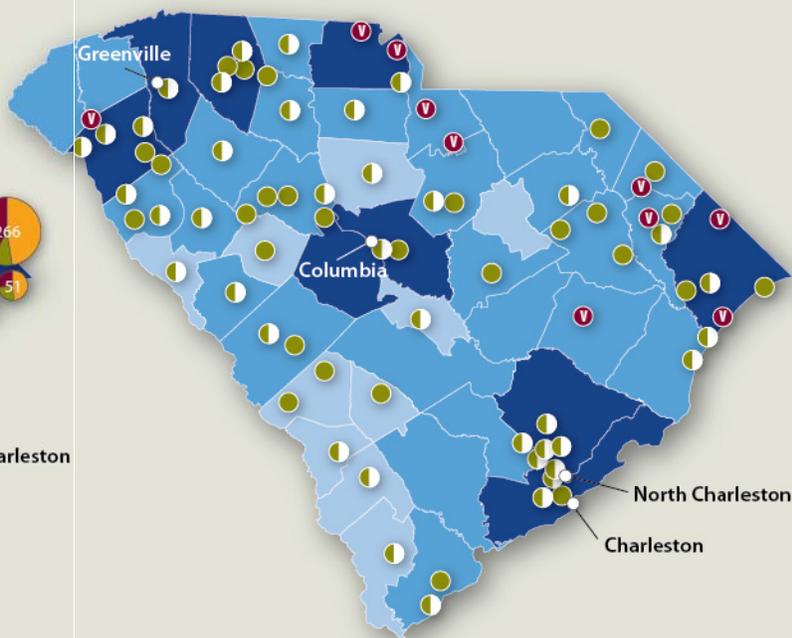
Characteristics of EMS Agencies in South Carolina



EMS Agency Personnel Types

- EMT-Basic
- EMT-Intermediate
- EMT-Paramedic

The size of the pie chart is proportional to the total number of personnel, which is reflected by the number in the center of the chart.



EMS Agency Medical Director Oversight

- Full-time medical director
- Part-time medical director
- Volunteer medical director
- No medical director

County Population Size, 2006

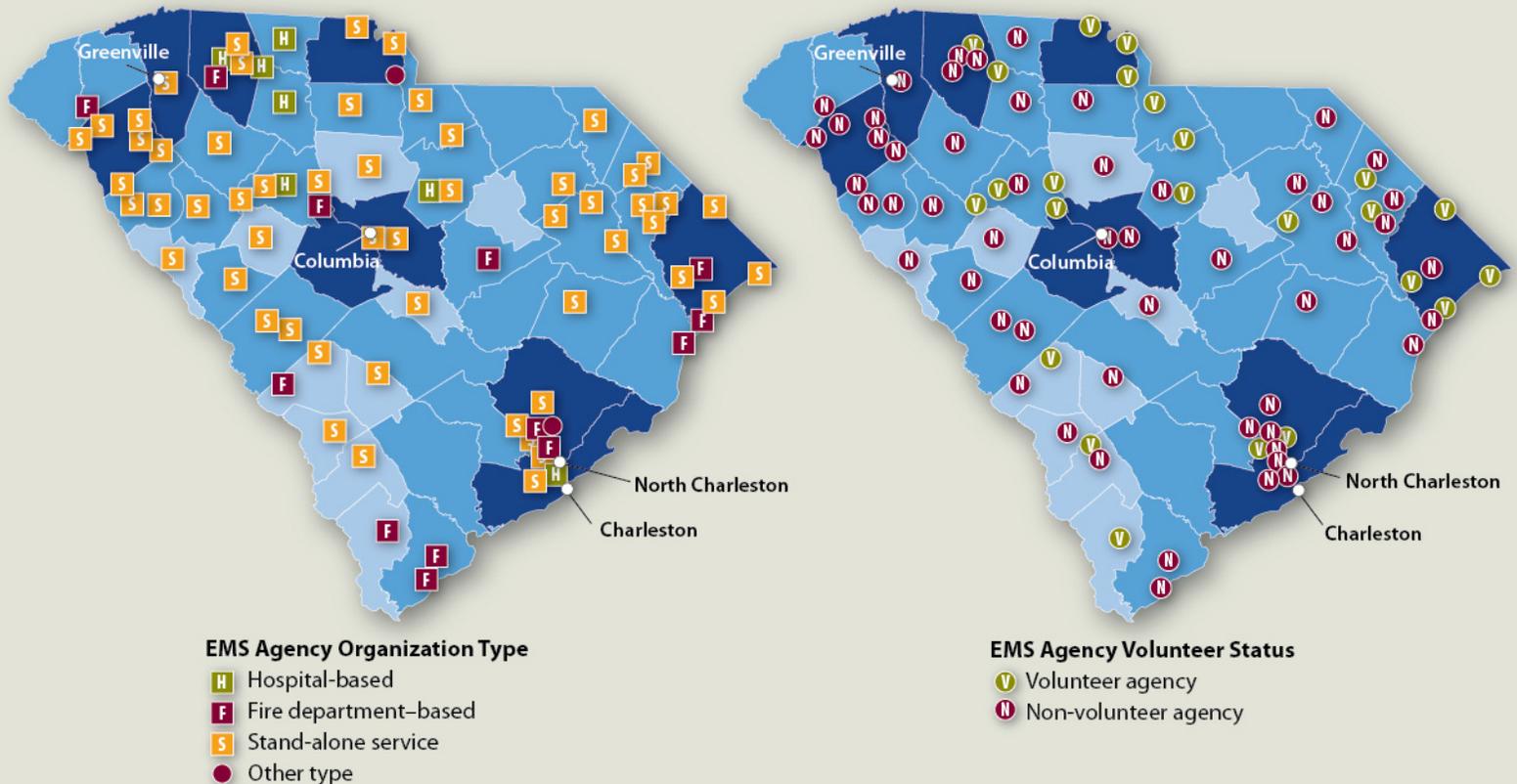
- 10,094–23,608
- 23,609–150,125
- 150,126–415,675

County total population categories represent the lowest, middle three, and highest quintiles, respectively.

EMS Scope of Practice for Cardiovascular Events: Percentage of EMS Agencies That Authorize EMTs to Perform Each Intervention*

Interventions	South Carolina			All 9 States		
	EMT-Basic (%)	EMT-Intermediate (%)	EMT-Paramedic (%)	EMT-Basic (%)	EMT-Intermediate (%)	EMT-Paramedic (%)
Thrombolytic agent	0.0	1.5	40.3	0.6	1.6	25.1
Morphine or equivalent	0.0	0.0	90.3	0.5	27.7	91.6
Surgical airway	0.0	0.0	23.6	0.6	2.2	78.8
Beta blocker	1.4	0.0	91.7	0.6	5.6	78.2
Anti-arrhythmic medication	1.4	1.5	97.2	0.7	24.0	93.2
Pressor agent	1.4	0.0	87.5	0.8	9.9	86.3
Central IV	0.0	5.8	26.4	1.0	15.2	35.0
Endotracheal intubation	59.5	88.4	98.6	8.7	41.0	95.4
Peripheral IV	6.8	95.7	100.0	9.2	93.3	97.1
Nitroglycerin from EMT supply	5.4	7.3	100.0	15.5	56.4	95.0
12-lead ECG	4.1	5.8	87.5	22.8	36.7	88.2
Monitor end-tidal CO2	40.5	47.8	86.1	26.4	45.0	90.2
Aspirin (ASA) from EMT supply	12.2	17.4	100.0	63.7	80.8	98.1
Alternate mechanical airway	77.0	94.2	97.2	66.7	91.9	97.0
Glucometry	83.8	92.8	100.0	83.9	95.3	98.2
Assistance with patient's nitroglycerin	75.7	82.6	98.6	86.7	91.6	93.1
Assistance with patient's aspirin	67.6	71.0	97.2	87.6	91.6	94.0
Pulse oximetry	94.6	97.1	100.0	93.8	98.0	99.1

* Source: Survey of EMS Practices for Heart Disease and Stroke, 2008. In South Carolina, 77 EMS agencies participated in the survey. In the total 9 states, 1,292 EMS agencies participated in the survey. However, not all of the respondents answered all questions in the survey. Therefore, the proportions reported may have slightly different denominators. Results displayed are not comprehensive and do not reflect all important characteristics for cardiovascular emergency response.

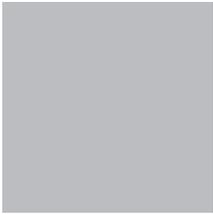
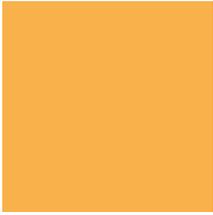


* EMS agency is represented at the centroid of the ZIP code in which it is located. In ZIP codes where multiple agencies responded to the survey, agencies are slightly offset from the centroid. All EMS agencies in the state are not represented on this map. Only EMS agencies that responded to the survey and answered the questions relevant to each map are included here.

EMS Agency Characteristics That Are Important for Cardiovascular Emergency Response*

		South Carolina		All 9 States	
Number of Agencies that Responded to Survey		77		1,292	
		Count	(%)	Count	(%)
Location	Rural	37	48.0	665	51.5
	Urban	40	52.0	627	48.5
Organization Type	Fire based	19	24.7	756	58.5
	Non-fire based	58	75.3	536	41.5
Volunteer Status	Volunteer	23	29.9	545	42.4
	Non-volunteer	54	70.1	672	55.2
Medical Director Involvement	Full-time	26	34.7	520	40.9
	Part-time	39	52.0	354	27.8
	Volunteer	10	13.3	383	30.1
	No medical director	0		15	1.2
	Involvement in past 4 weeks	35	46.7	633	50.4
Communication Center	Prioritizes dispatching	34	44.7	678	54.2
	Provides caller with CPR instructions	42	55.3	861	69.5
	Uses automatic vehicle location technology	16	21.1	210	16.6
Highest EMS Level of Life Support	Basic life support	5	6.7	187	15.6
	Intermediate life support	3	4.0	187	15.6
	Advanced life support	67	89.3	828	68.9
Online Immediate Access to Medical Consultation	Always, 24 hours a day, 7 days a week	72	96.0	1,155	90.3
	Sometimes, less than 24 hours a day	3	4.0	88	6.9
	Never	0		36	2.8
Provides On-Scene Time Benchmark	Chest pain or suspected heart attack	67	88.2	1,045	82.0
	≤ 15 min	59	88.1	914	87.7
	> 15 min	8	11.9	128	12.3
	Cardiac arrest	65	85.5	969	76.1
	≤ 15 min	53	81.5	806	83.4
	> 15 min	12	18.5	160	16.6
	Stroke	67	88.2	1,037	81.4
	≤ 15 min	59	88.1	921	89.1
> 15 min	8	11.9	113	10.9	
Uses Stroke Scale for Diagnosing Stroke		67	88.2	1,018	80.3
Patient Information to Receiving Hospital in Advance of Arrival	Yes	74	98.7	1,158	96.3
	No	1	1.3	45	3.7
New Therapy or Technology Adopted for Stroke in the Past Year	Most common therapies/technologies reported (if specified):				
	Revised or new stroke protocol	13	44.8	399	31.4
	Adopted Miami Emergency Neurologic Deficit (MEND) scale				
	Adopted Cincinnati Stroke scale				
Funding Basis	Private for-profit	6	7.8	102	8.0
	Private not-for-profit	21	27.3	184	14.4
	Public/government	41	53.3	933	72.8
	Public-private partnership	8	10.4	62	4.8
System Capabilities	Basic 9-1-1 system	5	6.6	160	12.6
	Enhanced 9-1-1 system	61	80.3	1,073	84.2
	Other	10	13.2	41	3.2

* Source: Survey of EMS Practices for Heart Disease and Stroke, 2008. In South Carolina, 77 EMS agencies participated in the survey. In the total 9 states, 1,292 EMS agencies participated in the survey. However, not all of the respondents answered all questions in the survey. Therefore, the proportions reported may have slightly different denominators. Results displayed are not comprehensive and do not reflect all important characteristics for cardiovascular emergency response.



For more information please contact Centers for Disease Control and Prevention

1600 Clifton Road NE, Atlanta, GA 30333

Telephone: 1-800-CDC-INFO (232-4636)/TTY: 1-888-232-6348

E-mail: cdcinfo@cdc.gov **Web:** www.cdc.gov

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