Bundles of Care

Getting to the next level

Anthony N. Cascio
November 8, 2013

Agenda

Disclosures

Introductions

The Why - Background

The What

The How

Disclosure: Anthony N. Cascio

With respect to the following presentation, there has been no relevant (direct or indirect) financial relationship between the party listed above (and/or spouse/partner) and any for-profit company in the past 24 months which could be considered a conflict of interest.

About me…

Emergency!

Cadet (Explorer)

UMBC Emergency Health Services

Montgomery County, Maryland

Newark, NJ

Native Air

STAT Flight

Robert Wood Johnson University Hospital

RWJUH Now: At-A-Glance

610 beds

1,750 Medical Staff

5,315 employees

34,200 inpatient admissions

1,100,000 outpatient visits

96,400 emergency department visits

- 71,600 adult
- 24,800 pediatric

2,900 trauma cases

RWJUH Now: At-A-Glance

19,000 surgeries

13,000 cardiac procedures

2,300 births

Approximately 90 Heart, Kidney & Pancreas transplants

15,000 radiation therapy treatments

Specialty Centers for the People of New Jersey

- International Center for Terror Medicine
- University Center for Disaster Preparedness and Emergency Response
- The Gamma Knife Center at RWJ

RWJ Robert Wood Johnson University Hospital

RWJUH Campus

RWJ Robert Wood Johnson University Hospital

The Power of Collaboration

Our remarkable campus is comprised of:

- RWJUH
- Rutgers Robert Wood Johnson Medical School
  - Child Health Institute
  - Cardiovascular Institute
  - Eric B. Chandler Health Center
- Rutgers Cancer Institute of New Jersey
- Bristol-Myers Squibb Children's Hospital
- PSE&G Children's Specialized Hospital

The Power of Collaboration

- Rutgers University:
  - College of Nursing
  - Ernest Mario School of Pharmacy, and
  - Institute for Health, Health Care Policy and Aging Research
- Ronald McDonald House
- Embrace Kids Foundation
- New Brunswick Health Sciences Technology High School

This is what makes our academic medical center truly unique!

RWJ Health System

RWJ-Rahway

RWJ-Hamilton

Children's Specialized Hospital

Bristol-Myers Squibb Children's Hospital

RWJ Mobile Health Service

Comprehensive system

Regional Communications

Tiered System

- BLS
- ALS
- SCT

- Education
- Research

RWJ Mobile Health Service

BLS
Non-Emergency Transports

4 municipalities

112 square miles

266,000 residents

13 units at peak

20,000 responses annually

ALS
2 Counties

230 square miles

440,000 residents

7 units at peak

19,000 responses annually

RWJ Mobile Health Service

Research

Special Events

TEMS Unit

NJ EMS Task Force

- Central Host Agency

NJ EMS Task Force

"To provide New Jersey and the region with a highly trained, equipped and ***specialized*** EMS resource to support operations at major incidents and pre-planned events using a well coordinated, robust all-hazards approach through the State's Emergency Management System"

Summer of 2011…

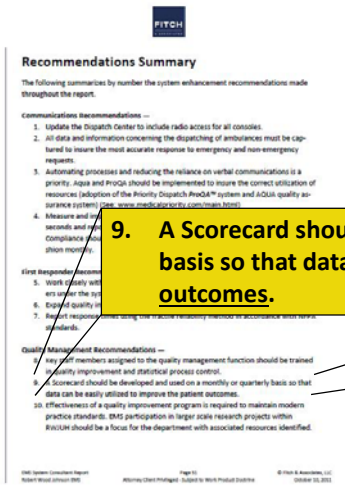
Organizational Effectiveness, Efficiency, and Environmental Assessment


ORGANIZATIONAL EFFECTIVENESS, EFFICIENCY AND ENVIRONMENTAL ASSESSMENT
FOR ROBERT WOOD JOHNSON EMS

Recommendations

1. Communications
2. First Responder
3. **Quality Management**
4. Medical Direction and Accountability
5. Fleet and Logistics
6. Preparedness
7. Staffing
8. Technology Integration
9. Resource Utilization and Demand
10. **System Finance and Funding**
11. Governance, Growth, Organizational Structure & Leadership

Quality Management



Recommendations Summary

The following summaries by number the system enhancement recommendations made throughout the report.

Communications Recommendations –

1. Update the Dispatch Center to include radio access for all consoles.
2. All data and information concerning the dispatching of ambulances must be captured to insure the most accurate response to emergency and non-emergency requests.
3. Automating processes and reducing the reliance on verbal communications is a priority. Aqua and ProQA should be implemented to insure the correct utilization of resources (adoption of the Priority Dispatch *ProQA*™ system and AQUA quality assurance system) (See, www.medicalpriority.com/main.html)
4. Measure and im… seconds and repo… Compliance shou… sion monthly.

First Responder Recomm…

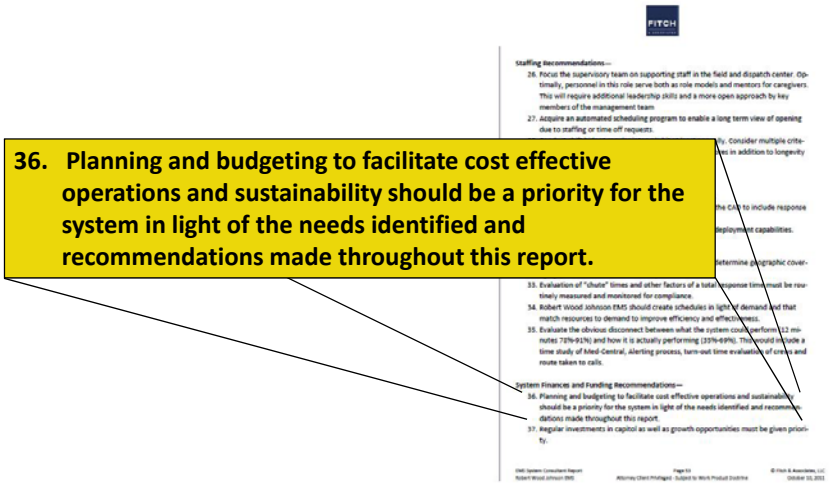
5. Work closely with… ers under the sy…
6. Expand quality im…
7. Report response times using the Priority Dispatch system in accordance with NFPA standards.

Quality Management Recommendations –

8. Key staff members assigned to the quality management function should be trained in quality improvement and statistical process control.
9. A Scorecard should be developed and used on a monthly or quarterly basis so that data can be easily utilized to improve the patient outcomes.
10. Effectiveness of a quality improvement program is required to maintain modern practice standards. EMS participation in larger scale research projects within RWJUH should be a focus for the department with associated resources identified.

9. A Scorecard should be developed and used on a monthly basis so that data can be easily utilized to improve patient outcomes.

System Finance and Funding



36. Planning and budgeting to facilitate cost effective operations and sustainability should be a priority for the system in light of the needs identified and recommendations made throughout this report.

Have you heard about the new pirate movie?

It's rated AARRRRRGGH!

Environmental Scan

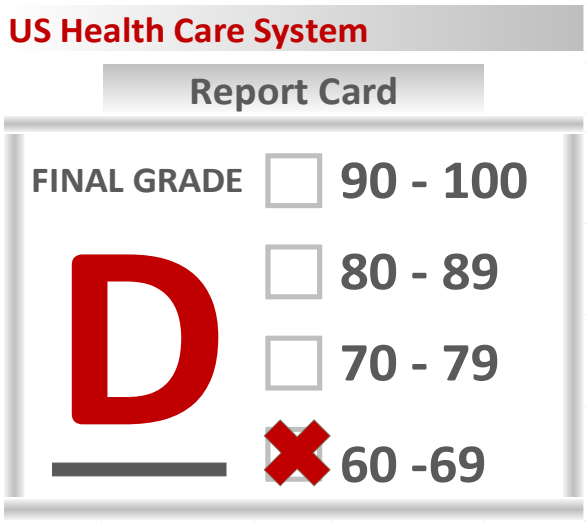
What was going on around us?

Once Upon a Time…

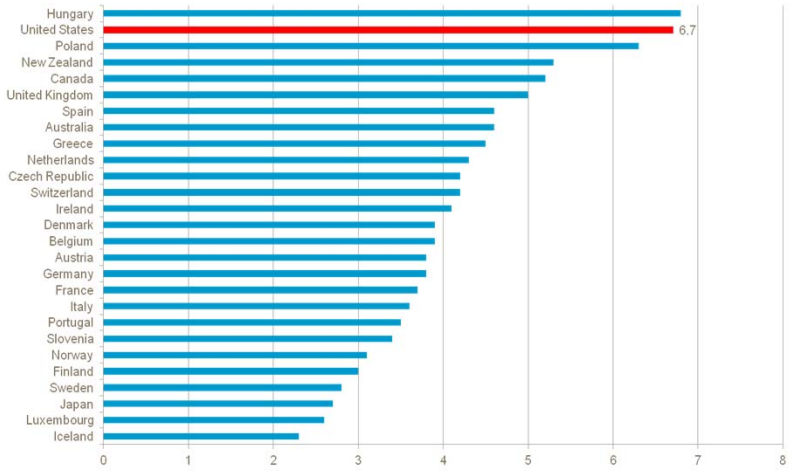
"It was taken as an article of faith among most Americans that the U.S. health care system was simply the best in the world…"

The Commonwealth Fund

2006

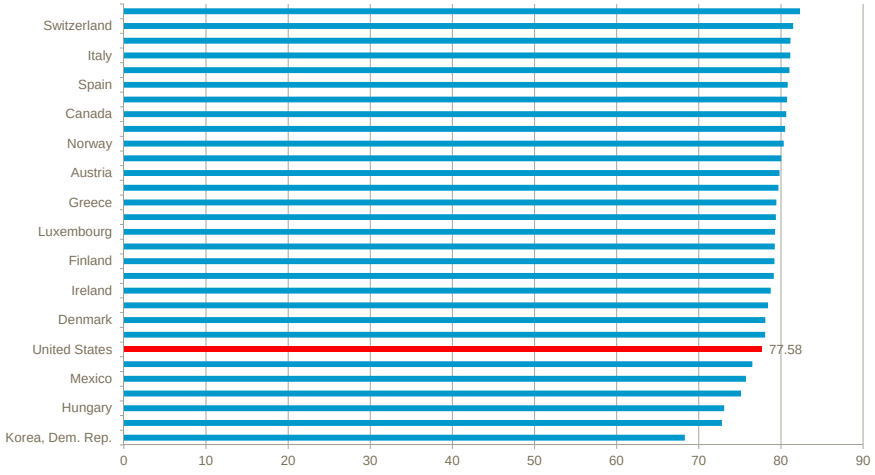


Infant Mortality Rates per 1,000 Live Births Among OECD Nations, 2006



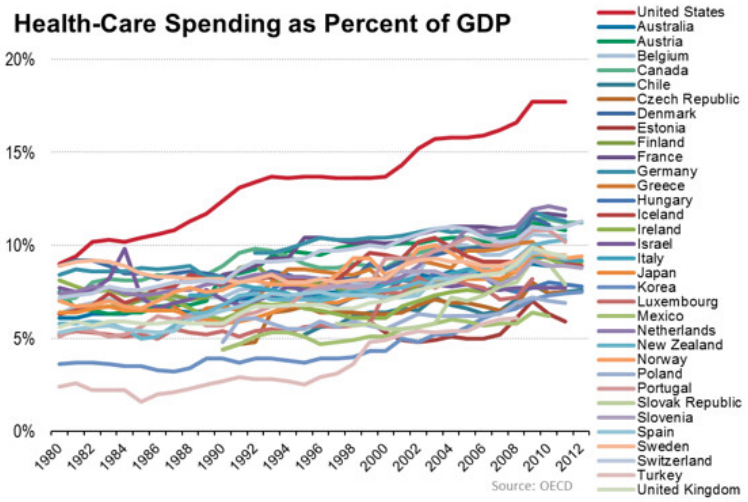
Source: The World Bank, 2013

Life Expectancy at Birth Among OECD Nations, 2006



Source: The World Bank, 2013

Healthcare Costs
Per Capita Spending



Source: OECD Health Data 2010 (June 2010).

Institute for Healthcare Improvement

"Everyone should get the best care and health possible."

Institute for Healthcare Improvement

Triple Aim:

1. Improve the patient experience of care (quality and satisfaction)
2. Improve the health of populations
3. Reduce the cost of health care

Source: American Ambulance Association, 2008

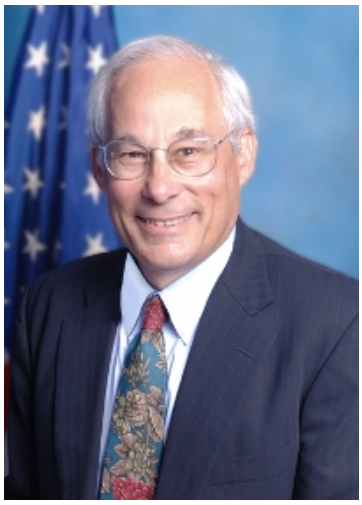
Hallmarks of a High Performance EMS System

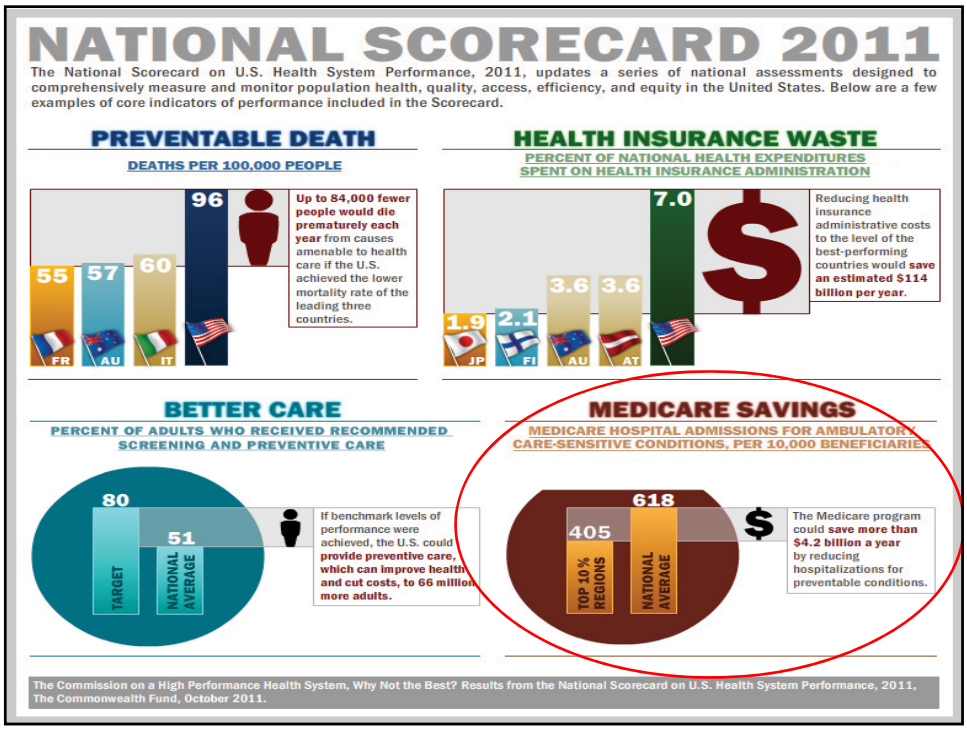
Hallmarks of a HPEMS System:

1. Clinical Quality
2. Customer Satisfaction
3. Response Time Reliability
4. Economic Efficiency

Source: American Ambulance Association, 2008

Dr. Donald Berwick



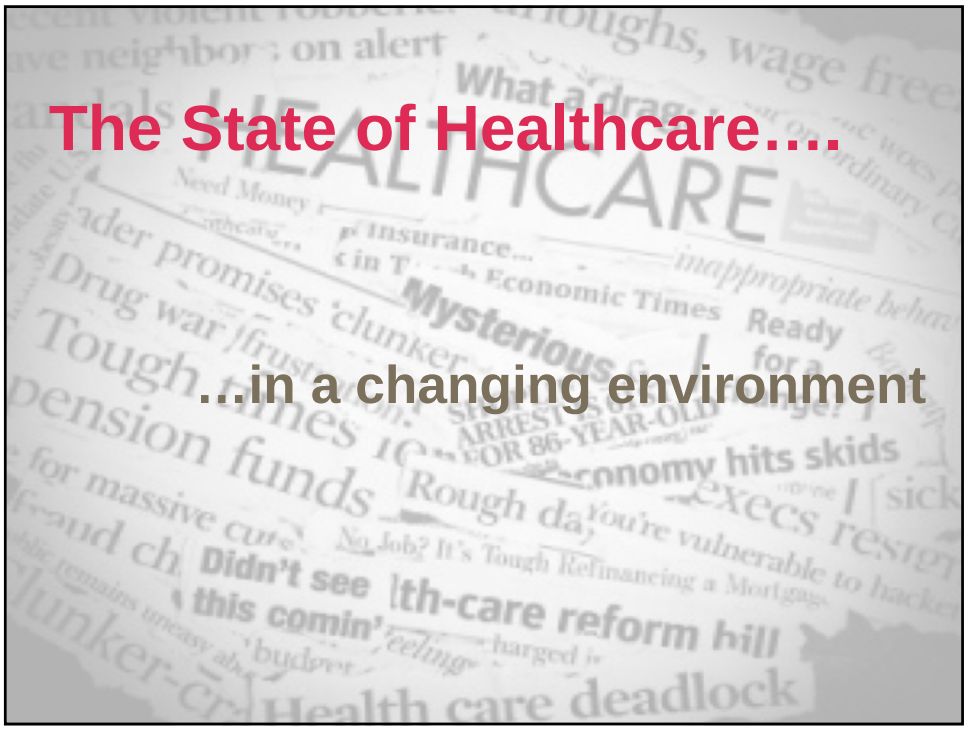


How Does Virginia Compare?

State	2007	2009
Virginia	24	22
Maryland	16	17
North Carolina	30	41
West Virginia	42	35
Kentucky	43	45
New Jersey	22	30

RWJ Robert Wood Johnson University Hospital


APPROVED
MAR 23 2010
"...there will be a whole new world as far as health insurance is concerned."

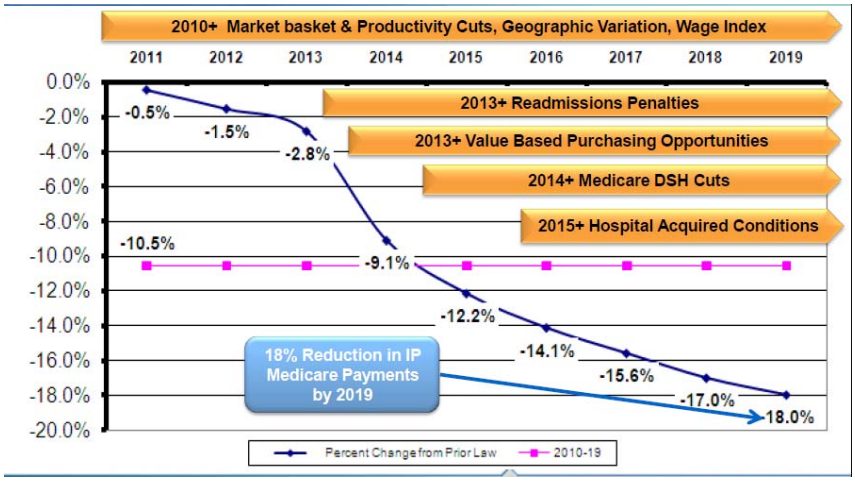

The State of Healthcare….
…in a changing environment
HEALTHCARE
Mysterious
Economic Times
Ready
Didn't see
this comin'
th-care reform bill
Health care deadlock

Penalties

- "Penalizes hospitals if patients are ***re-admitted*** to the hospital within one month of a visit for a condition that should have been dealt with on the first trip"
- "When a hospital does not meet a performance standard for the performance period, the DRG ***payment is decreased***"
- "***Reduced Medicare payment*** to certain hospitals for hospital-acquired conditions (effective FY 2015)"

Health Reform

Means cuts to Reimbursement



Sample figures for a 500 bed hospital
Courtesy of: Premier

What kind of socks does a pirate wear?

AARRRRGGHyle!

It's not just hospitals…

January 09, 2009

Email Print Register Bookmark RSS What's This

EMS & Fire Budget Cuts May Put Public At Risk, National Survey Finds

Making Smart Choices about Fire and Emergency Medical Services in a Difficult Economy

PUBLIC WORKFORCE

Firefighters Feel the Squeeze of Shrinking Budgets

In small and large cities alike, firefighters have gone from heroes to budget bait.

BY JONATHAN WALTERS | JANUARY 2011

ICMA

What does the future hold?

Value Based Purchasing

Patient Experience Equation

$$\textbf{Value} = \frac{\text{Quality + Patient Experience}}{\text{Cost}}$$

WE CAN DO BETTER

Best Practices

Institute for Healthcare Improvement

Bundle of Care Defined…

"Structured way of improving the processes of care and patient outcomes: a small, straightforward set of evidence-based practices — generally three to five — that, when performed collectively and reliably, have been proven to improve patient outcomes."

Resar R, Pronovost P, Haraden C, Simmonds T, et al. Using a bundle approach to improve ventilator care processes and reduce ventilator-associated pneumonia. Joint Commission Journal on Quality and Patient Safety. 2005;31(5):243-248.

What is it?

Quality improvement tool

Several interventions grouped together

Evidenced based medicine

Collectively yield improved patient outcomes

Characteristics of a Bundle of Care

Synergistic effect: 1+ 1 = 3

Dichotomous: yes or no

Compliance is “all or none”

Happy Meal Analogy

1. Cheese Burger
2. Fries
3. Milk
4. Apple Dippers
5. Toy

Guidelines vs. Bundles

Guidelines	Bundles
Long	Short
Not all inclusive	All inclusive
Confusing	Not confusing
Not all EBM	All EBM
Nice to do	Have to do
Can be difficult to translate into action	Easy to translate into action

Why did the pirate go on vacation?

He needed some AARRRRGGHH and AARRRRGGHH!

How did we change?

Begin with the end in mind…

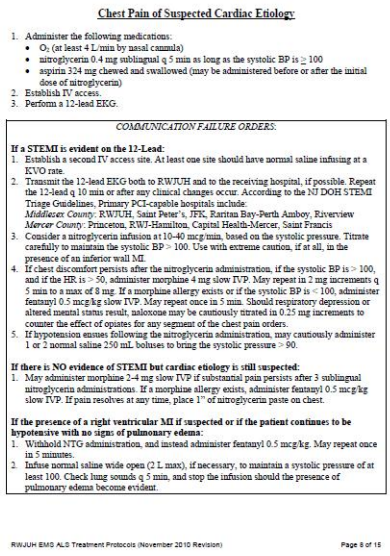
Develop BOC based on patient complaint(s) and/or assessment findings where out of hospital care provides a known (EBM) benefit to the patient thus resulting in improved outcomes.

Current State…Then

What	How
Cardiac discomfort/STEMI	Measuring individual components
Cardiogenic PE	Not necessarily EBM
Stroke	Impact on patient outcomes?
Trauma	
Pain	
Pediatrics	
RSI	
Sudden Cardiac Arrest	

Example…

1. ASA Administration
2. 12 Lead EKG



Chest Pain of Suspected Cardiac Etiology

1. Administer the following medications:
   - O_2 (at least 4 L/min by nasal cannula)
   - nitroglycerin 0.4 mg sublingual q 5 min as long as the systolic BP is ≥ 100
   - aspirin 324 mg chewed and swallowed (may be administered before or after the initial dose of nitroglycerin)
2. Establish IV access.
3. Perform a 12-lead EKG.

COMMUNICATION FAILURE ORDERS:

If a STEMI is evident on the 12-Lead:

1. Establish a second IV access site. At least one site should have normal saline infusing at a KVO rate.
2. Transmit the 12-lead EKG both to RWJUH and to the receiving hospital, if possible. Repeat the 12-lead q 10 min or after any clinical changes occur. According to the NJ DOH STEMI Triage Guidelines, Primary PCI-capable hospitals include:
   Middlesex County: RWJUH, Saint Peter's, JFK, Raritan Bay-Perth Amboy, Riverview
   Mercer County: Princeton, RWJ-Hamilton, Capital Health-Mercer, Saint Francis
3. Consider a nitroglycerin infusion at 10-40 mcg/min, based on the systolic pressure. Titrate carefully to maintain the systolic BP > 100. Use with extreme caution, if at all, in the presence of an inferior wall MI.
4. If chest discomfort persists after the nitroglycerin administration, if the systolic BP is > 100, and if the HR is > 50, administer morphine 4 mg slow IVP. May repeat in 2 mg increments q 5 min to a max of 8 mg. If a morphine allergy exists or if the systolic BP is < 100, administer fentanyl 0.5 mcg/kg slow IVP. May repeat once in 5 min. Should respiratory depression or altered mental status result, naloxone may be cautiously titrated in 0.25 mg increments to counter the effect of opiates for any segment of the chest pain orders.
5. If hypotension ensues following the nitroglycerin administration, may cautiously administer 1 or 2 normal saline 250 mL boluses to bring the systolic pressure > 90.

If there is NO evidence of STEMI but cardiac etiology is still suspected:

1. May administer morphine 2-4 mg slow IVP if substantial pain persists after 3 sublingual nitroglycerin administrations. If a morphine allergy exists, administer fentanyl 0.5 mcg/kg slow IVP. If pain resolves at any time, place 1" of nitroglycerin paste on chest.

If the presence of a right ventricular MI if suspected or if the patient continues to be hypotensive with no signs of pulmonary edema:

1. Withhold NTG administration, and instead administer fentanyl 0.5 mcg/kg. May repeat once in 5 minutes.
2. Infuse normal saline wide open (2 L max), if necessary, to maintain a systolic pressure of at least 100. Check lung sounds q 5 min, and stop the infusion should the presence of pulmonary edema become evident.

RWJUH EMS ALS Treatment Protocols (November 2010 Revision) Page 8 of 15

Chest Pain Suspected Cardiac Etiology

Component	Jan 13
ASA Admin	91.8%
12 Lead EKG	93%

The In-between

Project 3: Quality Improvement

	ID	Key Actions to Achieve Initiative	Owner	Dependencies	Status
71	3.I.	Regularly measure both clinical and operational skills and use appropriate remediation processes to ensure all staff maintain required competences.		8	In Progress
72	3.I.1	Develop bundles of care	Camarda	3.I.1.a.vii	Complete
73	3.I.1.a	Define current PI indicators collected by RWJ EMS	Calabrese		Complete
74	3.I.1.b	Cardiac discomfort/ STEMI	Camarda		Complete
75	3.I.1.c	Cardiogenic Pulmonary Edema	Camarda		Complete
76	3.I.1.d	Stroke	Camarda		Complete
77	3.I.1.e	Trauma	Camarda		Complete
78	3.I.1.f	Pain	Camarda		Complete
79	3.I.1.g	Sudden Cardiac Arrest	Camarda		Complete
80	3.I.2	Develop measurements of bundles of care	Camarda		Complete
81	3.I.2.a	Define Performance Indicators: Numerator, Denominator, inclusion, exclusion, etc.	Camarda		Complete
82	3.I.2.b	Build auto-generated reports in emsCharts	Camarda		Complete
83	3.I.2.b.(i)	Cardiac Discomfort/ STEMI			Complete
84	3.I.2.b.(ii)	Cardiogenic Pulmonary Edema			Complete
85	3.I.2.b.(iii)	Stroke			Complete
86	3.I.2.b.(iv)	Trauma			Complete
87	3.I.2.b.(v)	Pain			Complete
88	3.I.2.b.(vi)	Sudden Cardiac Arrest			Complete
89	3.I.2.c	Establish & publish performance goals	Camarda		Complete
90	3.I.3	Direct Field Observation & Competency Evaluation - BOC	Camarda		Complete
91	3.I.3.a	Cardiac discomfort & STEMI	Camarda		Complete
92	3.I.3.b	Cardiogenic Pulmonary Edema	Camarda		Complete
93	3.I.3.c	Stroke	Camarda		Complete
94	3.I.3.d	Trauma	Camarda		Complete
95	3.I.3.e	Cardiac Arrest	Camarda		Complete
96	3.I.3.f	Pain	Camarda		Complete
97	3.I.3.g	review and comment on 3.I.1 - 3.I.3	TEAM		Complete
98	3.I.4	Near Misses and Events			Not Started
99					
100	3.I.5	Revisit bundles of care annually (minimally) to revise or create as necessary as expected performance normalizes	Camarda		In Progress

Identify Patient Presentations

Known benefit through:

1. Recognition (assessment)
2. Intervention (care), and
3. Disposition (transport to appropriate facility with notification)

Which did we choose?

Cardiac discomfort/STEMI

Cardiogenic PE

Stroke

Trauma

Pain

Sudden Cardiac Arrest

Define

Performance Indicators

Numerator

Denominator

Inclusion criteria

Exclusion criteria

Chest Pain Suspected Cardiac Etiology

Phase	Action	Definition
Recognition	12 Lead EKG	Performed within 10 minutes of arrival and prior to any NTG
Intervention	Aspirin	Administered within 10 minutes to all patients without an allergy.
Disposition	Advanced Notification	Advanced notification of a STEMI was made.

National Association of EMS Physicians. NAEMP Position Statement on Prehospital Management of Acute Myocardial Infarction. Available at http://www.naemsp.org/documents/NAEMSPMIPositionStatementApprovedMay2007.pdf

Ferguson J.D., Brady W.J., Perron A.D., Kielar N.D., Benner J.P., Currance S.B., Braithwaite S., Aufderheide T.P. The prehospital 12-lead electrocardiogram: Impact on management of the out-of-hospital acute coronary syndrome patient, *The American Journal of Emergency Medicine*. March 2003; Volume 21, Issue 2, 136-142, ISSN 0735-6757, 10.1053/ajem.2003.50011.

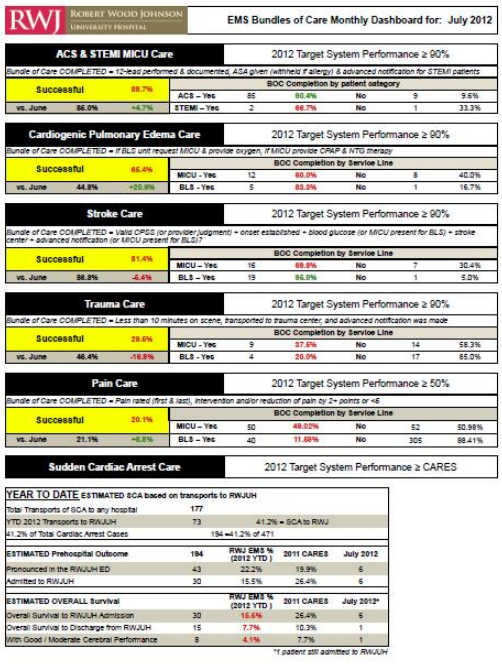
Nashed A.H., Allegra J.R., Larsen S., Horowitz M., Bolus IV nitroglycerin treatment of ischemic chest pain in the ED, *The American Journal of Emergency Medicine*, May 1994; Volume 12, Issue 3, 288-291, ISSN 0735-6757, 10.1016/0735-6757(94)90140-6.

O'Connor R.E, Brady W., Brooks S.C., Diercks D., Egan J., Ghaemmaghami C., Menon V., O'Neil B.J., Travers A.H., Yannopoulos D. 2010 American Heart Association Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care Science Part 10: Acute Coronary Syndromes. *Circulation*. 2010;122:S787-S817

Component vs. Composite

Component	Jan 13
Aspirin	91.8%
12 Lead EKG	93%
Arrival 2 12 Lead EKG	15 min
COMPOSITE	**85.5%**

Measure and Feedback



EMS Bundles of Care Monthly Dashboard for: July 2012

ACS & STEMI MICU Care — 2012 Target System Performance ≥ 90%

Bundle of Care COMPLETED = 12-lead performed & documented, ASA given (withheld if allergy) & advanced notification for STEMI patients

			BOC Completion by patient category				
Successful	88.7%						
vs. June	86.0%	+4.7%	ACS – Yes	85	90.4%	No	9	9.6%
			STEMI – Yes	2	66.7%	No	1	33.3%

Cardiogenic Pulmonary Edema Care — 2012 Target System Performance ≥ 90%

Bundle of Care COMPLETED = If BLS unit request MICU & provide oxygen, if MICU provide CPAP & NTG therapy

			BOC Completion by Service Line				
Successful	66.4%						
vs. June	44.8%	+20.8%	MICU - Yes	12	60.0%	No	8	40.0%
			BLS - Yes	5	83.3%	No	1	16.7%

Stroke Care — 2012 Target System Performance ≥ 90%

Bundle of Care COMPLETED = Valid CPSS (or provider judgment) + onset established + blood glucose (or MICU present for BLS) + stroke center + advanced notification (or MICU present for BLS)?

			BOC Completion by Service Line				
Successful	81.4%						
vs. June	86.8%	-5.4%	MICU – Yes	16	69.6%	No	7	30.4%
			BLS – Yes	19	95.0%	No	1	5.0%

Trauma Care — 2012 Target System Performance ≥ 90%

Bundle of Care COMPLETED = Less than 10 minutes on scene, transported to trauma center, and advanced notification was made

			BOC Completion by Service Line				
Successful	28.6%						
vs. June	46.4%	-16.8%	MICU - Yes	9	37.5%	No	14	58.3%
			BLS - Yes	4	20.0%	No	17	85.0%

Pain Care — 2012 Target System Performance ≥ 50%

Bundle of Care COMPLETED = Pain rated (first & last), intervention and/or reduction of pain by 2+ points or <6

			BOC Completion by Service Line				
Successful	20.1%						
vs. June	21.1%	+8.8%	MICU – Yes	80	48.02%	No	52	50.98%
			BLS – Yes	40	11.59%	No	305	88.41%

Sudden Cardiac Arrest Care — 2012 Target System Performance ≥ CARES

YEAR TO DATE ESTIMATED SCA based on transports to RWJUH				
Total Transports of SCA to any hospital	177			
YTD 2012 Transports to RWJUH	73	41.2% = SCA to RWJ		
41.2% of Total Cardiac Arrest Cases	194 =41.2% of 471			
ESTIMATED Prehospital Outcome	**194**	**RWJ EMS % (2012 YTD)**	**2011 CARES**	**July 2012**
Pronounced in the RWJUH ED	43	22.2%	19.9%	6
Admitted to RWJUH	30	15.5%	26.4%	6
ESTIMATED OVERALL Survival		**RWJ EMS % (2012 YTD)**	**2011 CARES**	**July 2012***
Overall Survival to RWJUH Admission	30	16.6%	26.4%	6
Overall Survival to Discharge from RWJUH	15	7.7%	10.3%	1
With Good / Moderate Cerebral Performance	8	4.1%	7.7%	1

*1 patient still admitted to RWJUH

Work Smarter Not Harder….

ePCR System

Computer Aided Dispatch

Future considerations

- FIrstPass

Direct Field Observation and Competency Evaluation

PATIENT CARE Performance Standard — **Cardiac discomfort & STEMI**

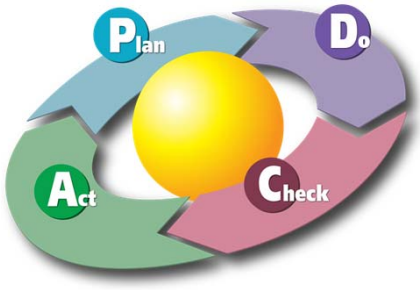
Applies to: EMT, Paramedic, RN – **Provider Level:** □ BLS □ ALS	**Employee Name:**
Type of Evaluation: □ Initial □ Annual □ Periodic	**Date of Evaluation** (mm/dd/yy): / / 20
Method of □ Simulation, scenario # □ Direct	**Evaluator Name:**

Please mark the box correlating to performance. Ratings lower than 3 and higher than 4 must have supporting comments.

	Evaluation Factor	Expected Performance	Rating 1 "Can't do"	Rating 2 "Can do with supervision"	Rating 3 "Can do routinely, requires assistance with complex case"	Rating 4 "Can do and teach others"	Rating 5 "Could write the book"
1	**Symptom recognition**	*Identifies typical & atypical discomfort patterns. Describes at-risk populations. Describes populations likely to have atypical discomfort patterns. Recognizes need for ALS*	*Frequently unable to recognize typical or atypical cardiac discomfort. Consistently unable to identify at-risk populations.*		*Consistently recognizes typical presentations & usually recognizes atypical presentations. Consistently able to identify at-risk populations.*		*Consistently recognizes cardiac discomfort presentations and at-risk populations.*
	Comments:						
2	**12-lead ECG**	*Recognizes the need for 12-lead ECG immediately (BLS & ALS). Performs 12-lead ECG prior to any medications except oxygen (ALS). Repeats 12-lead ECG during transport (serial ECGs)*	*Consistently unable to recognize the need for 12-lead ECG screening for STEMI. Performs 12-lead ECG after initiating ALS-level patient care. Inconsistently*		*Consistently identifies the need to perform 12-lead ECG prior to ALS-level patient care. Performs serial ECGs with occasional prompting*		*Verbalizes the clinical & operational benefits of 12-lead screening upon initial assessment. Performs 12-lead ECG performance with initial application of the ECG*
	Comments:						
3	**Aspirin administration**	*Recognizes the indications, contraindications, and dosage*	*Frequently unable to verbalize the indications, contraindications, and dosage*		*Consistently identifies indications, contraindications, & dosage*		*Frequently verbalizes the rationale for aspirin administration & can rapidly identify the indications, contraindications & dosage*
	Comments:						
4	**STEMI (ALS)**	*Performs: 1. Transport to PCI center 2. Transmission of ECG to receiving facility with patient name, age, & gender entered 3. Advanced notification for PCI team*	*Frequently unable to select correct destination facility, transmit ECG, or notify receiving facility for PCI team activation.*		*Consistently identifies PCI center as transport destination and notifies receiving facility for PCI team activation. Occasionally requires prompting on procedure to*		*Frequently enters patient information into monitor prior to capturing 12-lead ECG, provides immediate notification to most appropriate PCI center.*
	Comments:						
5	**Adjunctive therapies**	*Considers oxygen with dyspnea or SpO2<94%. Considers nitroglycerin if indicated by assisting pt. (BLS) or administering (ALS). Morphine*	*Performs adjunctive therapies without concurrently performing / initiating any of the 4 required performance standards above.*		*Performs adjunctive therapies simultaneously or after 4 beneficial care measures.*		*Rapidly recognizes the need to perform beneficial therapies then initiates adjunctive therapies. Recognizes relevant pitfalls*
	Comments:						

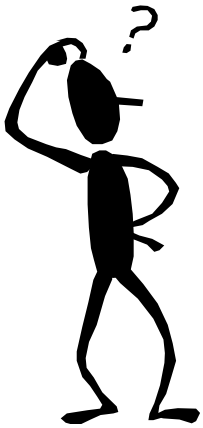
Employee Signature: **Evaluator Signature:**

Continuous…



Revisit bundles of care annually to revise or create as necessary as expected performance normalizes.

Questions, Comments, or Snide Remarks?



Summary…

One last pirate joke…

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