REQUEST FOR APPROVAL

Check One: □ Local Optional Scope of Practice **X** Trial Study

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EMS Medical Director: Reza Vaezazizi **Date**: November 1, 2017

Local EMS Agency: Riverside County EMS Agency

Proposed Procedure or Medication: Use of Ketamine by Paramedics for Analgesia

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Please provide the following information. For information provided, check "yes" and describe. For information not provided, check "no" and state the reason it is not provided.

***Please refer to Mountain Valley EMS proposal for the following documents**

Yes No

□ X 1. Description of the procedure or medication requested: *_____

_____

□ X 2. Description of the medical conditions for which the procedure/medication will be utilized:*_____

_____

□ X 3. Alternatives (Please describe any alternate therapy [ies] considered for the same conditions and any advantages and disadvantages): *_____

_____

□ X 4. An estimate of frequency of utilization: *_____

_____

□ X 5. Other factors or exceptional circumstances: *_____

_____

Please attach the following documents. Check "yes" for each document attached; for documents not attached, check "no" and state the reason it is not attached.

Yes No

□ X 6. Any supporting data, including relevant studies and medical literature. * **Included in MVEMS Trial Study proposal**

7. Recommended policies/procedures to be instituted regarding:

□ X Use: **Included in MVEMS Trial Study Proposal**

□ X Medical Control: **Included in MVEMS Trial Study Proposal**

X □ Treatment Protocols: **Attachment A- REMSA policy #5802- Ketamine for Analgesia Trial Study**

□ X Quality assurance of the procedure or medication: **Included in MVEMS Trial Study Proposal**

□ X 8. Description of the training and competency testing required to implement the procedure or medication:

Included in MVEMS Trial Study Proposal

X □ 9. Copy of the local EMS System Evaluation and Quality Improvement Program plan for this request: **Attachment B- EMS System CQI Plan**

REQUEST FOR APPROVAL
Form #EMSA-0391
Application for Local Trial Study
Use of Ketamine by Paramedics for Analgesia

1. Description of the procedure or medication requested

   Ketamine is an NMDA-antagonist agent that is widely used throughout the world in both the prehospital and hospital environments for several indications, including sedation, analgesia, anxiolysis, excited delirium, and induction of anesthesia or intubation. It has been shown in many studies to be a very effective agent in these uses and importantly has been shown to be stable in those with hemodynamic compromise and does not cause respiratory depression as an inherent property of the drug. Most studies thus far have been case series, reports, and small studies that have shown clear efficacy. The study aims to prove that the medication is safely administered by paramedics in a prehospital setting for analgesia. The expected effect of the medication in this setting is rapid relief of pain without the untoward side effects typically seen with narcotic analgesics, including sedation and respiratory compromise.

   Side effects of ketamine include:

   1. Nausea/Vomiting
   2. Tachycardia*
   3. Increased salivation*
   4. Laryngospasm*

   - Occurs mostly at higher doses

   Administration:

   If the patient's pain score is 5 or more, administer 0.3 mg/kg (maximum 30mg) of ketamine intravenously. One single additional dose at 0.3mg/kg (maximum 30mg) may be administered intravenously after 15 minutes if pain score remains above 5. Total possible dose of 0.6 mg/kg, or 60mg, whichever is less.

   Ketamine, in this study, will not be administered intramuscularly nor intranasally

2. Description of the medical conditions for which the procedure/medication will be utilized:

   Paramedics would follow established protocol by the Riverside County Emergency Medical Services Agency Treatment Guidelines titled Ketamine For Analgesic Use. Ketamine 0.3mg/kg (maximum single dose 30 mg) will be administered via IV infusion in a 50cc or 100cc bag of either normal saline or D5W, and it will be substituted for the currently used agents for analgesia, morphine and/or fentanyl.

   To be eligible for the study, patients must be at least 15 years of age, have experienced an acute traumatic or burn injury, have a GCS of 15, would normally receive analgesia

during routine care and/or transport, and have a pain score of at least "5" on a scale of 0 - 10, with 0 meaning "no pain" and 10 meaning "extremely severe pain".

Exclusion criteria include:
→ GCS 14 or less
→ Known or suspected pregnancy
→ Known allergy to Ketamine
→ Known or suspected alcohol or drug intoxication
→ Having received narcotic analgesia in any form within 6 hours of planned Ketamine administration
→ Pain score less than 5 prior to first dose of Ketamine

3. Alternatives (Please describe any alternate therapy[ies] considered for the same conditions and any advantages and disadvantages)

   Currently, most provider agencies in California use morphine sulfate and/or fentanyl citrate for parenteral analgesia. Though these are acceptable medications, they are not universally efficacious at a standard dose. In addition, there are known drug shortages of narcotic analgesics. Narcotics also have a high addiction potential and have been diverted for personal use by EMS providers. Narcotics also carry a higher adverse effect profile including allergic reactions, flushing, nausea, vomiting, respiratory depression, and sedation

4. An estimate of frequency of utilization

   50 - 75 cases per month

5. Other factors or exceptional circumstances

   None

6. Any supporting data, including relevant studies and medical literature

   Please see attached supporting studies – None. Included in MVEMS Trial study proposal

7. Recommended policies/procedures to be instituted regarding:

   In this trial, we plan a prospective evaluation of reduction in pain scores in patients receiving Ketamine for analgesia. All ALS transport providers and ALS first responders will be trained in the use of Ketamine and use Ketamine preferentially over narcotic analgesics for pain control in qualified patients. Morphine sulfate and fentanyl citrate will remain available for treatment of patients that do not meet inclusion criteria, meet exclusion criteria, or for those patients that the ALS provider chooses to not use Ketamine. The evaluation will seek to identify the absolute and relative reduction in pain scores over the duration of transport (primary outcome). In addition, the evaluation will seek to assess number of doses of Ketamine required to achieve adequate pain control,

the frequency and types of adverse effects, and any untoward reactions to Ketamine (secondary outcomes). A data safety monitoring committee consisting of the agency associate medical director, in addition to a representative of an ALS private provider's QI staff, a representative of an ALS fire provider's QI staff, and the QI coordinator of the EMS agency, will review, as close to real time as possible, all adverse events and protocol violations.

Medical Control

Responding paramedics use offline medical control but may contact their assigned base hospital for any medical direction needs

Treatment Protocol

See Attachment A

Quality Assurance of the procedure or medication:

1. All providers participating in the trial use a fully electronic PCR system
2. All cases of Ketamine administration will be forwarded to the agency medical director daily; in the case of an adverse event that indicates a life or safety health to the community, the evaluation will be suspended immediately. The data safety monitoring committee will monitor all aspects of the study and notify the state EMS authority if the study is halted for any reason.
3. Narcotic analgesic uses will be reviewed monthly for data keeping purposes.

Prehospital Outcomes/Measures Tracked:
Patient age
Chief Complaint
Initial and final pulse, BP, respiratory rate
Estimated patient weight
Dose of Ketamine administered
Any repeat doses administered
Beginning and final pain score
Complications
Protocol violations

8. <u>Description of training and competency testing required to implement the procedure or medication</u>:

An educational PowerPoint will be developed regarding the pathophysiology and management of pain using Ketamine. All provider agencies within the county will be required to have their paramedics view this PowerPoint and nurse educators will also hold educational sessions with the paramedics. Intravenous administration of medications

is already a skill for paramedics. Ketamine will not be administered IM or IN for this study.

9. Copy of the local EMS System Evaluation and Quality Improvement Program plan for this request:

   See Attachment B

Attachment A

	Trial Study	5802
	Effective: April 1, 2018	Expires: March 31, 2019
Policy: **Ketamine for Analgesia Trial Study**	Approval: Medical Director **Reza Vaezazizi, MD**	Signed DRAFT
Applies To: **Authorized Study Participants, EMS System**	Approval: REMSA Director **Bruce Barton**	Signed DRAFT

PURPOSE

To determine the role of prehospital ketamine to improve pain management for patients meeting trial study inclusion criteria. Every patient deserves to have his or her pain managed. Consider reassurance, position of comfort, ice and gentle transport as part of pain management. Privacy and separation from parents may benefit adolescents. Do not attempt to completely relieve the patient's pain, but treat aggressively enough to make it bearable.

AUTHORITY

California Health and Safety Code - Division 2.5: Emergency Medical Services [1797. - 1799.207.]
California Code of Regulations, Title 22. Social Security, Division 9. Prehospital Emergency Medical Services

Inclusion Criteria

Patients must be 15 years of age or older with a GCS of 15 with a pain scale score of 5 or greater.

The prehospital use of ketamine for analgesia should be considered for adult patients with pain associated with:

- Acute traumatic injury
- Acute burn injury

Contraindications

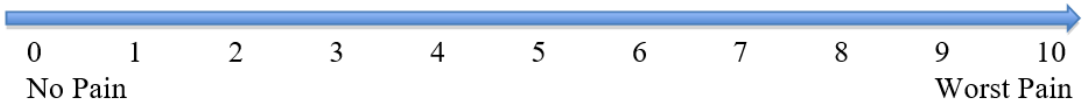
- Any patient under 15 years of age
- Allergy to Ketamine
- Known or suspected pregnancy
- Known or suspected alcohol/drug intoxication
- Received narcotics of ANY form within the past 6 hours

Procedure

If patient meets inclusion criteria listed above:

- Assess the patient's pain utilizing the numeric pain scale. If pain scale is reported as 5 or higher:
  - Administer ketamine 0.3 mg/kg (max single dose of 30 mg) in 50-100 mL of Normal Saline via IV Bolus drip over 5 minutes.
    ***(Do not administer IVP, IO Bolus, IM or IN**– trial study parameters for pain control are for IVPB admin.)*
  - Place the approved ketamine silver wristband on patient prior to transporting patient to a most appropriate receiving facility
  - Reassess the patient's vital signs, including pain scale score, every 5 min during transport.
  - After 15 mins, If pain scale score remains reported at 5 or higher, a second dose of ketamine can be administered at 0.3 mg/kg (max single dose of 30 mg) in 50-100 mL of Normal Saline via IV Bolus Drip over 5 minutes.

This is the official pain scale to be used in patient assessment and documented on the PCR.



Documentation Requirements

Must use a REMSA contracted or authorized electronic patient care report system:

- Documentation must include:
  - Age
  - Gender
  - Race/ethnicity
  - Weight
  - Date/time of injury onset of symptoms
  - Mechanism of injury
  - Initial systolic blood pressure and vital signs
  - Pain scale before and every 5 minutes after ketamine administration
  - If trauma patient: Blunt or penetrating trauma location and description of injuries
  - Vital signs including Glasgow Coma Scale and temperature: pre, during and every 5 min post- ketamine administration
  - Any fluid administration
  - Date/time ketamine was started
  - Past medical history
  - Allergies
  - Any first response agency or transport service defined questions related to ketamine

Attachment B

RIVERSIDE COUNTY
EMS
AGENCY

September 14, 2017

California Emergency Medical Services Authority
Attention: Adam Davis, Quality Improvement Coordinator
10901 Gold Center Drive, Suite 400
Rancho Cordova, California 95670-6073

Dear Mr. Davis,

Attached is the Riverside County EMS Agency's (REMSA) annual update of our Continuous Quality Improvement (CQI) plan. REMSA continues to incorporate the CQI plan with daily activities and system enhancements.

REMSA completed a multi-year process for the development of an EMS System Strategic Plan. In aligning with the strategic plan, Goal #1: "Adopt and cultivate methodologies and collaborative practices that focus on system wide CQI activities to optimize patient outcomes," is the core of CQI activities. REMSA uses the Continuous Quality Improvement Leadership Team (CQILT) committee as a working group for CQI activities, policy review, root-cause analysis, and innovation in our system. This committee includes all system providers and hospital liaisons; these key stakeholders help us identify indicators for the year. REMSA collects this data and provides feedback and "loop closure" to the providers via quarterly reports for CQI, Stroke, and STEMI.

In Mid-2016 and throughout 2017 REMSA has migrated as a system to one single ePCR platform. REMSA is currently working on utilizing the CQI module within *ImageTrend* to identify the key CQI elements for each provider to approach in a unified manner. REMSA is developing standardized reports in Report Writer to ensure reports are being ran consistently. *ImageTrend* contains a Hospital Hub, where hospitals are encouraged to enter outcome data on patients that are brought to them via ambulance. In the future, REMSA will be evaluating the use of this practice to achieve loop closure and feedback regarding patient outcomes.

For specialty care systems within Riverside County, there are currently four Trauma centers, 12 Primary Stroke centers and six STEMI centers. Each specialty has a quarterly meeting in which reports are generated and presented based on data submission from the hospitals and providers specific to our county. Riverside County Trauma Program continues to participate in the multi-county TXA (Tranexamic Acid) Trial study until late 2018. 100% of patients who receive TXA are reviewed for the appropriateness of the administration on both the LEMSA and provider level. REMSA participates in monthly TXA conference calls to discuss any cases and stayed informed of issues identified. Additionally REMSA includes re-education of the policy during our annual policy updates as well as on an as needed basis. As of to date there have been 180 appropriate administrations, 28 patients who received TXA outside of the study criteria which are considered fallouts, and 56 patients who potentially could have received TXA, but did

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not and are considered to be missed opportunities. Both Stroke and STEMI programs are currently going through a realignment process with the implementation of the CA State Regulations.

Annual Core Measures were submitted in March of 2017. For 2016, the same set of measures (Core and REMSA) were collected consistently. Beginning in 2017 with the implementation of *ImageTrend,* all of REMSA's core measures will be re-evaluated in the beginning of 2018. The first priority is to ensure consistency of data input by the end user; therefore, ePCR fields are being individually evaluated for validity. State Core Measures will continue to be collected as reported annually.

Please see the following attached matrix for the specific goals and progress REMSA has made since the last CQI Plan update. I have attached the CQI report for the 2016 year. The quarter one 2017 Stroke and STEMI reports are attached for your review as well.

Sincerely,

Lisa Madrid - Paramedic
EMS Specialist
QI Coordinator / EMS Educator
Riverside County EMS Agency (REMSA)

Goal #1: Adopt and cultivate methodologies and collaborative practices that focus on system wide CQI activities that optimize patient outcomes.

Objectives	Activity	Metric	Target Date	Status
1.1 The CQI Technical Advisory Committee will evaluate and modify REMSA's EMS Quality Improvement Plan. The plan should:	Link CQI results and outcome drivers to development of EMS education and training programs	• Data collected through Core measures (annually) and local measures (quarterly) • # of training updates as a result of outcomes from CQILT	Continuous, reported annually Quarter 1, 2018	**Completed:** Core measures completed for 2016. Next due date is March 31, 2018 for 2017 data. **Completed:** Policy update training Q1 every year. 2017 included: modifications to MCI policy, numerous drug calculation updates, Updates to spinal stabilization policy.
	Include the development of a CQI dashboard with indicators designed around the most significant quality indicators to aid all of the stakeholders in the monitoring and trending	• Quarterly reports to the system for CQI, Stroke and STEMI Programs.	To be determined. REMSA is exploring vendors to assist with this goal.	**Partially Completed:** Quarterly reports were performed in 2016 with 100% compliance form all providers, moving forward in 2017 these reports will be restructured with the anticipation of full

	to these indicators across the County.			implementation of Imagetrend across all providers.
	Assure "loop closure" on all studies elements, including findings of after-action reports and plans of correction.	• # of specialty care centers providing feedback to field crews	January 2018	**Partially Completed:** System committee meetings for specialty care are developing a template for all hospitals to use to deliver outcome feedback to the field providers.
	Integrate all EMS System participants, all clinical initiatives and essential operational measures within the EMS System	• One ePCR platform for all providers	July 2017	**Partially Completed**: One ePCR platform for all providers in the system to ensure a clean data collection process and CQI reporting. Hospitals using same platform with different focus.
	Provide access to reliable EMS system data to stakeholders and public, as allowed by law.	• Post system indicators and reports on REMSA's website	Quarterly	**Completed:** Meeting minutes and reports are updated quarterly

	Establish research and publish studies of quality improvements results to advance the science of EMS	• # of studies authored by REMSA staff and published	September 2018	**Partially Completed:** Currently in year two of the TXA trial study with ICEMA, Alameda, and Napa counties.
1.2 Continue development and implementation of a comprehensive program for system data collection, analysis and reporting that includes:	The continued use of a single ePCR for the entire EMS System with an associated technology refresh program	• All providers are working off of the same ePCR, using NEMSIS 3.4 data elements	July 2017	**Partially Completed:** 15 Providers are currently on Imagetrend with three more slated for the future to bring us to 100%
	Integration of all system response data, Computer Aided Dispatch (CAD), EMD Priority QA IT models or their equivalent and non-emergency out-of- hospital providers (IFT, event medical services providers).	• # of planning meeting for EMD Dispatch and Priority QA software	July 2017	**Completed:** Goals were met working on making a unified QA process for all EMD centers
	Use of, as appropriate, Lean, Six Sigma, root-cause analysis, and other appropriate tools for data analysis, reporting and action planning.	• CQILT to perform RCA on issues presented • REMSA to review cases based on Just Culture practice, address	Ongoing	

		system issues as a whole and provide the individual with feedback and education		
	Integration with hospital electronic medical records (EMRs)	• REMSA is currently exploring the options on how to make this manageable	January 1, 2020	**NOT COMPLETED:** On hold at this time in 2017
	Integration with the Inland Empire Healthcare Information Exchange (HIE) for Bi-directional information flow	• REMSA is currently exploring the options on how to make this manageable	January 1, 2020	**NOT COMPLETED:** On hold at this time in 2017
	Evaluation of ongoing funding opportunities to support robust countywide data collection	• # of specialty center designated fees charged by REMSA	July 2018	**NOT COMPLETED:** REMSA to implement fees in 2018 for all specialty care programs
1.4 Implement an integrated and dynamic, performance- based education/ training	REMSA staff to develop curriculum for EMT,	• # of EMT, Paramedic and MICN training	January 2019	**COMPLETED:** After thorough review of all programs, it was

program that supports the CQI program and optimal patient outcomes	Paramedic and MICN training programs	programs in Riverside county		decided that no changes will be made at this time. REMSA will not develop, but continue to review all curriculum for all programs.
1.6 Revise EMS System Policies and Procedures to support the new EMS System Quality Improvement Plan	CQILT will contribute to the REMSA CQI Plan	• CQI Plan will be approved in October 2019	October 1, 2019	**NOT COMPLETE**

2013 Strategic Continuous Quality Improvement Plan (SCQIP)

Contents

About Riverside County EMS Agency (REMSA)

REMSA mission statement:

To assure the timely delivery of high quality, compassionate, and cost-effective emergency medical services to the people of Riverside County and to optimize these services through a balance of collaboration with the community and regulatory leadership.

REMSA values:

- We value the patient, as the focus of what we do.
- We value honesty and integrity.
- We value personal and organizational accountability.
- We value collaboration in our endeavors.
- We value inclusive decision-making.
- We value evidence-based change as an avenue to excellence.

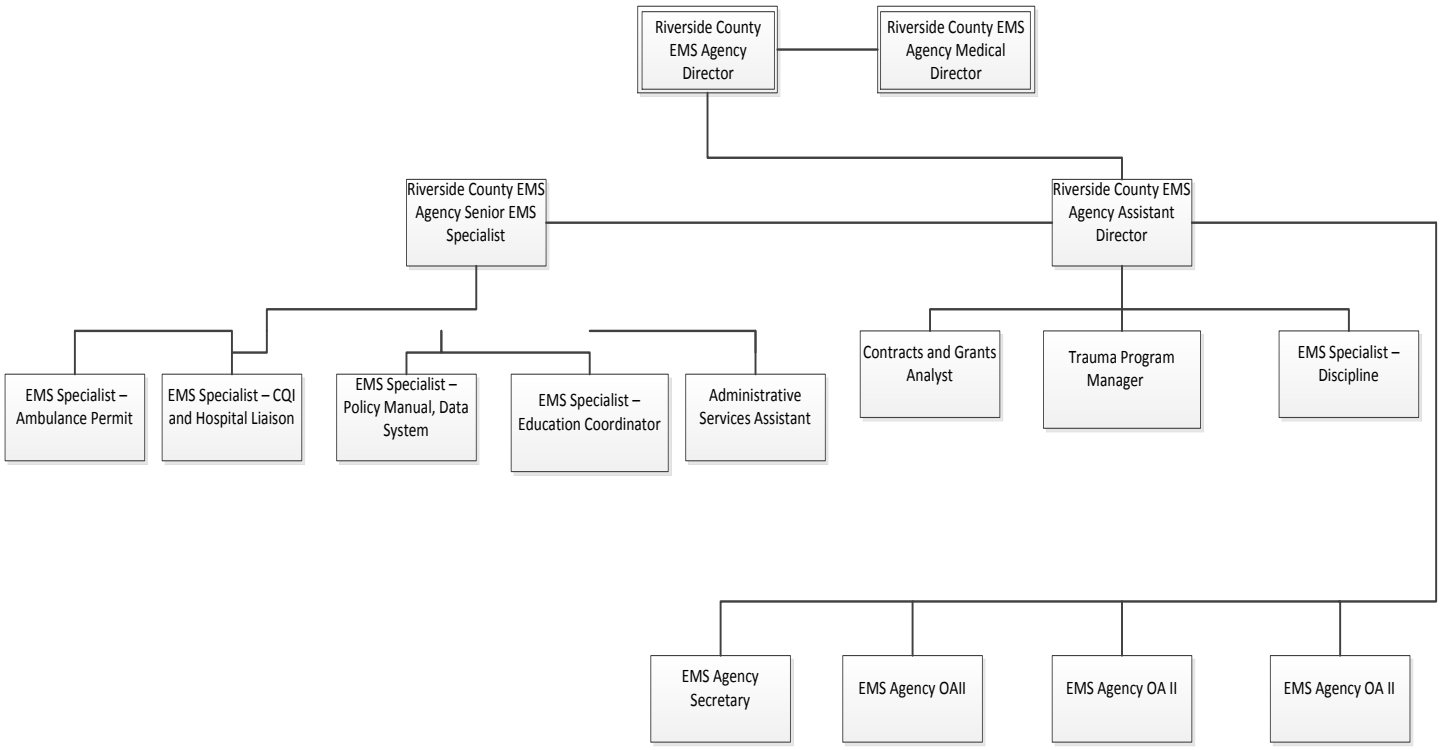
REMSA philosophies:

- System success is measured in the well-being of the people we serve.
- Each interaction brings value to us and the EMS system.
- The success of the organization is success for all.
- Our duty is to lead intelligently and regulate with consistency.

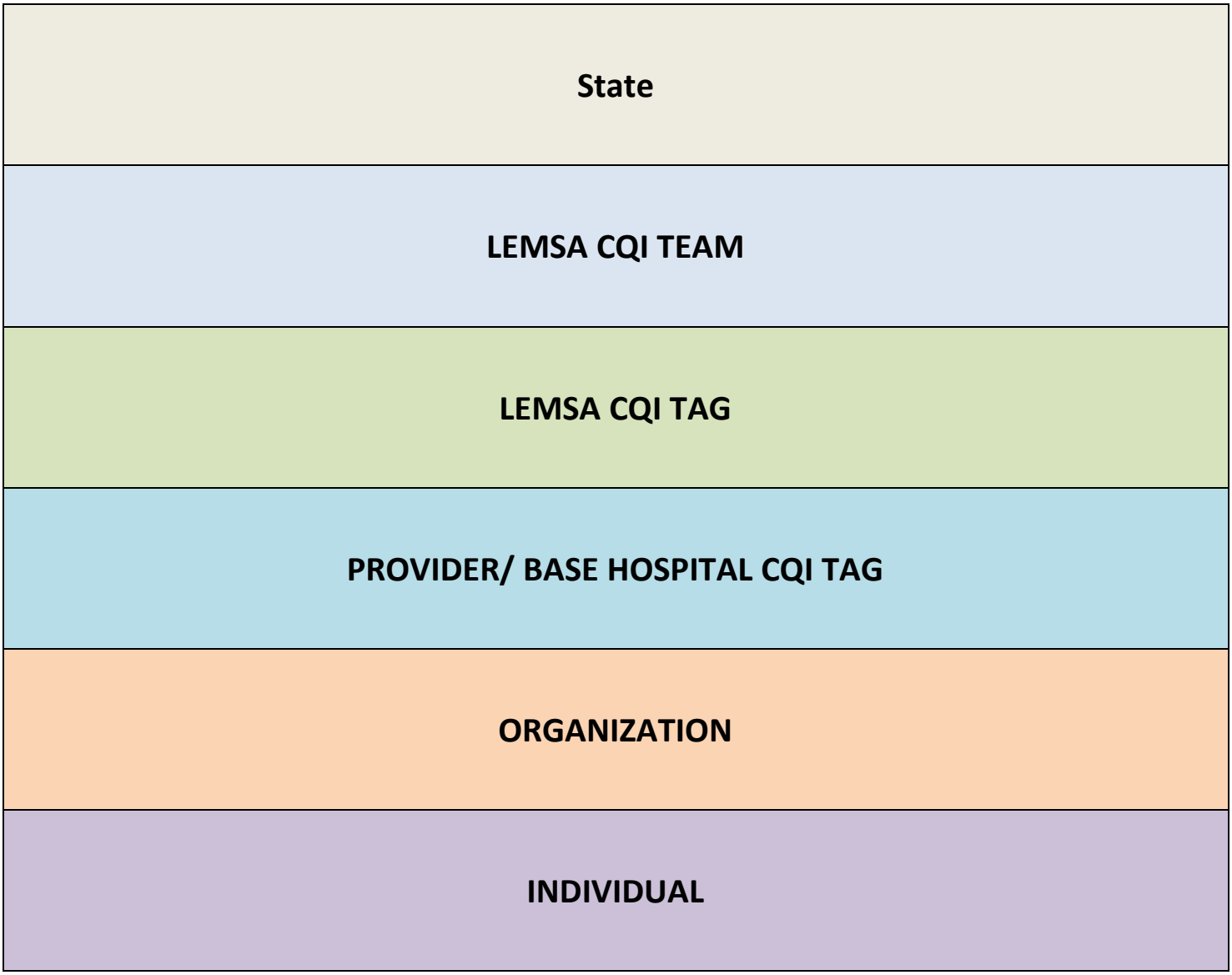
REMSA vision:

- To be the exceptional, outcome-focused EMS leader that others seek to model.

REMSA Organizational Chart



Reporting relationships between Providers/Base Hospitals, REMSA, and EMSA



Introduction

Continuous Quality Improvement (CQI) is a formal approach to the analysis of system performance and efforts to improve it. Riverside County EMS Agency (REMSA) is committed to the process of CQI. CQI is, by its very name, a continuous process. CQI includes such things as:

- Recognizing excellence, both individually and organizationally;
- Quantifying objectively what EMS does by trending, analyzing and identifying issues, concerns, and excellence based on those trends;
- Setting benchmarks;
- Promoting remediation rather than discipline. CQI also makes a powerful distinction between the two. Remediation is education. Discipline involves licensure.
- Working hand in hand with training, education and with risk management;
- Identifying system issues when possible rather than individual issues;
- Promoting itself as a business standard used in corporate strategic planning;
- Presenting itself as an evidence-based process equal to industry programs for education and personnel.

Continuous Quality Improvement (CQI) is a never-ending process in which all levels of healthcare workers are encouraged to team together, without fear of management repercussion, to develop and enhance the system they work in. Based on EMS community collaboration and a shared commitment to excellence, CQI reveals potential areas for improvement of the EMS system, identifies training opportunities, highlights outstanding clinical performance, audits compliance with treatment protocols, and reviews specific illnesses or injuries along with their associated treatments. These efforts contribute to the continued success of our emergency medical services through a systematic process of review, analysis, and improvement.

Strategic planning is used to set priorities, focus energy and resources, strengthen operations, ensure that employees and other stakeholders are working toward common goals, establish agreement around intended outcomes, and assess and adjust the organization's direction in response to a changing environment. It is a disciplined effort that produces fundamental decisions and actions that shape and guide what an organization is, who it serves, what it does, and why it does it, with a focus on the future. Effective strategic planning articulates not only where an organization is going and the actions needed to make progress, but also how it will know if it is successful.

REMSA has combined elements of both our Strategic Planning and our CQI planning into a single Strategic Continuous Quality Improvement Plan.

A by-product of the plan is the alliance of municipal agencies and private providers that offer EMS services within Riverside County. This affords all participants (administrator to first responder) an opportunity to work at peak capacity with energy and focus in a system that they can support, believe in, and have "ownership" in.

REMSA monitors the Continuous Quality Improvement (CQI) activities of all of the different components of the EMS System in a prospective (protocols, research), concurrent (ride-alongs, Field Training Officers), and retrospective (incident investigation, random audits) manner. Many of the QI activities take place at the organizational level.

This plan is a guideline for each Riverside County provider and Base Hospital to use when rewriting their organization's CQI plan. All EMS providers and Base Hospitals are required to submit their CQI plan to REMSA for review and approval. All CQI plans must be in accordance with the Riverside County EMS Agency's CQI plan.

The Riverside County Emergency Medical Services Agency (REMSA) is responsible for the oversight of the Emergency Medical Services (EMS) system in Riverside County. This system consists of Advanced Life Support (ALS) and Basic Life Support (BLS) First Responders; ALS, BLS and Critical Care Transport (CCT) Ambulances; ALS and CCT airships; dispatch agencies with trained dispatchers; Base Hospitals; Prehospital Receiving Centers; and various specialty centers (STEMI Receiving Centers, Trauma Centers, and Stroke Receiving Centers). Guided by the REMSA Protocols, medical direction is provided by the Base Hospitals to the EMS personnel in the field, as well as by the REMSA Protocol Manual.

REMSA's SCQI Plan has been written in accordance with the Emergency Medical Services System Quality Improvement Program Model Guidelines (Rev. 3/04).

Organization and Structure

Riverside County is the 4th largest county in California, serving a population of 2,268,783 citizens (United States Census, 2012), and comprising 7,206 square miles. Riverside County consists of urban, suburban, rural, and wilderness areas. In 2012, there were a total of 172,700 9-1-1 calls for medical aid in Riverside County. 9-1-1 calls initially come in to a Public Safety Answering Point (PSAP), and usually get re-routed to a secondary PSAP, which dispatches a fire unit. At the same time, the secondary PSAP also routes the call to the 9-1-1 Ambulance provider's dispatcher (if different), who dispatches the ambulance to the same call. Both the fire unit and the ambulance (usually from 2 different locations) go en route to the call. In most of Riverside County, the dispatchers are trained Emergency Medical Dispatchers, and they are giving pre-arrival/post-dispatch instructions to the reporting party and getting additional information about the call to relay to the responding units. In most areas of the County, the First Responder is an ALS unit. The City of Hemet and the City of Calimesa are served by Fire Department BLS first responders. Within the city limits of the City of Blythe, the ambulance only responds to 9-1-1 medical calls; no first responder is dispatched. Once on scene, the fire and private ambulance crews coordinate their efforts to provide the fastest and best emergency medical care possible. If the patient is determined to be suffering from a STEMI, a Stroke, or meets criteria for a Trauma Center, or if the paramedics need to request medical orders or direction, the EMS crew contacts a Base Hospital, who gives the medical orders or directs the crew to transport to a specialty center if it is appropriate. If the patient is critical, the fire paramedic frequently rides in with the transporting paramedic. Once at the hospital, care is assumed by the Emergency Department personnel. At this point, the crews are available to respond to other calls. Most of Riverside County 9-1-1 providers are on an electronic Patient Care Report (ePCR) system; documentation of the call is completed at this time, unless another call is pending.

The Riverside County EMS Agency itself is made up of one Director, one Assistant Director, one Senior EMS Specialist, six EMS Specialists (each with their own area of expertise), a Trauma Program Manager, a Contracts Analyst, three Office Assistant II's, a Secretary, and an Administrative Services Assistant. California Statute

states, “The local EMS agency shall plan, implement, and evaluate an emergency medical services system…consisting of an organized pattern of readiness and response services based on public and private agreements and operational procedures. The local EMS Agency shall be responsible for implementation of advanced life support systems and limited advanced life support systems and for the monitoring of training programs. The local EMS Agency shall be responsible for determining that the operation of training programs at the EMT I, EMT II and EMT P level are in compliance with this division, and shall approve the training programs if they are found to be in compliance with this division” (Health & Safety Code Sections 1797.204, 1797.205, and 1797.206).

Each agency shall submit a CQI plan to the EMS Agency for approval. The time frame for submission will be determined by REMSA. Appropriate revisions shall be made as requested by REMSA. Each agency shall conduct an annual review of their CQI plan. REMSA will evaluate the implementation of each agency’s CQI plan.

Current Status

Personnel

REMSA has several policies related to the initial accreditation, re-accreditation, and challenge of EMT, paramedic, and MICN personnel in Riverside County. EMTs, paramedics, and MICNs are required to stay current and knowledgeable regarding the policies and procedures of REMSA. This is accomplished via the providers, fire departments, and Base Hospitals holding protocol update classes during the first quarter of each year. REMSA assists this process by developing training tools, such as crosswalks between the old and the new policies.

Prehospital personnel performance issues are primarily addressed through the chain of command at the employer level. However, if an incident involves an action that constitutes a threat to public health and safety, or if the incident involves the potential for patient harm, the incident must be reported to REMSA. At that point, REMSA assumes the position of the coordinating agency for the incident investigation. The incident investigation process is described in Policy #7101 (The CQI system). Additionally, the REMSA CQI Technical Advisory Group (TAG) adopted a standardized practice for incident investigations in 2008, as well as a template for writing a narrative for an incident, writing a remediation plan that references national standards, and for the investigative process itself (Appendix A).

QI issues are considered QI or remedial ***except*** when intent to do wrong is proven. Once intent is discovered, the issue becomes a disciplinary issue, and is no longer a QI issue. Disciplinary issues are reviewed separately from QI issues by a different EMS Specialist.

Equipment and Supplies

REMSA has developed minimum inventory and supply requirements for the different identified EMS resources deployed throughout the County’s EMS System. These inventory lists are available in our policy manual (Policy #3301), as well as a standardized process for the handling of controlled substances (Policy #3302 – Management of Controlled Substances). Each provider organization is inspected annually to ensure

compliance with policy requirements. During the inspection process, approximately 20% of all items listed as required items in Policy #3301 are inspected by REMSA personnel. Additionally, provider records are inspected for such things as compliance with OSHA standards, current certification/licensure of employees, etc.

Documentation

REMSA has purchased and entered into an agreement with Sansio for an electronic data system, the largest portion of which is an Electronic Patient Care Report (ePCR). In 2011 and 2012, the REMSA providers began implementing the ePCR system utilizing "Flex Fields", data elements specific to their organization, to create an ePCR unique to that provider. In 2013, REMSA began the process of standardizing the ePCRs so that all are standardized, collecting the same data, for better comparisons and more accurate data collection. January 1, 2015 is the date for all providers in Riverside County to migrate to the Sansio electronic data system and have implemented the standard ePCR system. Hospitals have the ability to access the ePCRs via a website, hosted by the vendor.

On June 27, 2008, REMSA received approval from the California State EMS Authority for the Local EMS Agency (LEMSA) CQI Plan. Each provider and Base Hospital in Riverside County has submitted and received approval on their CQI plans. REMSA has developed a standardized method of reviewing and approving CQI plans from hospitals and providers, which was agreed upon by the CQI TAG (Appendix C). In 2011, an approved CQI plan was made a mandatory part of the ambulance permitting process for new providers to Riverside County. In 2012, this requirement was extended to all providers.

Clinical Care and Patient Outcome

Clinical care in Riverside County is guided prospectively by treatment protocols. This effort is led by the Policy Review Forum, a group made up of REMSA personnel and interested personnel from hospitals, providers, and fire departments. The Policy Review Forum advises REMSA on policy changes as a function of the annual policy review process. This group meets every month to discuss and review treatment and program policies in Riverside County. Every September, the group collects all policy/protocol changes for that year, and presents the draft protocol manual to the EMS System at the PMAC meeting. The manual is then sent out for a 30 day public comment period. REMSA discusses all suggestions and comments, drafts a formal reply to each comment, makes any necessary changes to the policies, and the final draft protocol manual is presented at the November PMAC meeting. The protocol manual is finalized by December 31 of each year. In January, providers, fire departments and Base Hospitals present training to their EMS employees on the new and revised policies.

Clinical care is managed retrospectively through several different QI meetings. The Trauma Audit Committee (TAC) is made up of Trauma Surgeons, Emergency physicians, Trauma Coordinators, and REMSA staff. TAC meets quarterly (will be three times per year in 2014) and reviews specific trauma cases. Peer review takes place, cases are adjudicated (as defined by current ACS standards), and loop closure is ensured by letters generated by REMSA and approved by TAC to meet practices and standards.

Helicopter EMS (HEMS) QI is a group of stakeholders (HEMS providers, ground providers, first responders, receiving hospitals) that meets every other month (will be quarterly in 2014) where all 9-1-1 calls that a helicopter responds to are reviewed by the group and receive a weighted score as defined by a matrix developed by the group.

In 2007, Riverside County established a ST-segment Elevation Myocardial Infarction (STEMI) system, whereby patients could receive a 12 Lead ECG performed by paramedics trained in the application and interpretation of ECGs. If the paramedics identify a STEMI on the ECG, they are contact a STEMI Base Hospital, and bypass other Prehospital Receiving Centers to transport the patient emergently to a designated STEMI Receiving Center (SRC). SRCs have been pre-designated by REMSA as hospitals that have met specific criteria to be able to perform interventional lifesaving procedures to reduce morbidity and mortality in this patient population. Currently, Riverside County has designated a total of 5 SRCs within the borders of Riverside County, and 3 additional SRCs in our surrounding counties. REMSA has partnered with the LEMSAs in surrounding counties to ensure that patients are able to cross county borders if it is the closest SRC, and data is collected from each of the designated hospitals in surrounding counties.

During most of 2013, REMSA has been developing a prehospital Stroke program, which is set to begin on April 1, 2014. The Stroke System Committee is comprised of physicians, nurses, and prehospital personnel interested in the development of this specialty system. REMSA is building the Stroke system to be able to grow and expand as the need for this specialty treatment increases. The initial goal is to have all of our Stroke Receiving Centers accredited by The Joint Commission (TJC), the Healthcare Facilities Accreditation Program (HFAP), or Det Norske Veritas (DNV) as Primary Stroke Centers. At this time, there are not enough hospitals with the aforementioned accreditation to meet the needs of the stroke population, although several hospitals are currently in the process of attaining this designation. In order to meet those needs, REMSA has defined a "Stroke Ready Hospital" as a twenty-four (24) hour per day, seven (7) days per week acute care hospital that is in the process of applying with a CMS approved accrediting body to become a Primary Stroke Center. These hospitals will be held to the same standards as Primary Stroke Centers. Beginning July 1, 2015, all designated Stroke Receiving Centers in Riverside County must have attained designation as a Primary or a Comprehensive Stroke Center from TJC, HFAP, or DNV in order to continue with local designation as a Stroke Center. The Stroke System will work in a similar manner to the STEMI System. Once paramedics have identified a potential stroke patient in the field setting, they must contact a Base Hospital for approval to bypass other hospitals to transport the patient to a Stroke Center.

Skills Maintenance and Competency

REMSA has written Performance Standards for several low frequency/high risk skills, which all EMTs, paramedics, and MICNs are required to attend at least once in each recertification cycle (every 2 years) beginning on April 1, 2014. These skills days have been standardized into four separate modules, which are offered by fire departments, providers and Base Hospitals. EMTs, paramedics, and MICNs are invited to attend any of the offered skills days at any location, certain in the knowledge that they are receiving the same training throughout the county. EMTs are held to BLS skills, paramedics and MICNs to ALS and BLS skills. MICNs supervise (via radio contact with the paramedics) these skills, but cannot perform some of them. MICNs are required to practice on those skills not in the nursing scope of practice, but are not required to test

for competency on them. All EMS personnel undergoing the skills days are required to have a form with signatures from REMSA-authorized skills competency verifier. This is available as our policy #9206 (EMT Skills Competency Verification, #9207 (AEMT Skills Competency Verification), and #9210 (ALS Skills Competency Verification Form). Continuing education (CE) is provided by CE providers approved by REMSA, including those approved by other California EMS agencies or the State EMS Authority. The CE processes are discussed in more detail in REMSA Policy #1301 (Continuing Education for EMS Personnel).

Transportation and Facilities

Riverside County has a total of 17 prehospital receiving centers, of which six are Base Hospitals, five are STEMI Receiving Centers, and four are Trauma Centers. Additionally, REMSA has designated two Trauma Centers and three STEMI Receiving Centers in neighboring counties so that these specialty patients are able to seamlessly cross county lines to go to the closest specialty receiving center in the most expeditious times. As noted under Clinical Care and Patient Outcome, REMSA is starting a prehospital Stroke program, to begin on April 1, 2014.

9-1-1 callers receive both an ALS first responder (via fire department) in most areas of the county. In the city of Calimesa and the city of Hemet the first responder is BLS (in the case of Hemet and Calimesa). The city of Blythe receives all of the prehospital medical services from Blythe Ambulance.

In the Cove Communities (the cities of Palm Desert, Rancho Mirage and Indian Wells) and in the city of Indio, 9-1-1 first responder and transport provider services are provided by Riverside County Fire Department. Cathedral City Fire Department provides the same services for Cathedral City. Idyllwild Fire Protection District (IFPD) provides ambulance transport services for the city of Idyllwild and the surrounding area. Idyllwild services three zones: Zone 1 is IFPD Service area; Zone 2 is CSA #38, Zone 3 is unincorporated county.

Interfacility transfers and BLS and CCT calls are serviced by 17 non-emergency providers. Three helicopter services are permitted by REMSA, serving both emergency and non-emergency calls. California Highway Patrol is recognized as an air rescue helicopter service. Gurney van and wheelchair transport providers are not permitted or overseen by REMSA.

Public Education and Prevention

REMSA relies heavily on our providers and our hospitals for providing public education on such things as CPR and AEDs, proper use of the 9-1-1 system, blood pressure checks, signs and symptoms of heart attack and stroke, and “Every 15 Minutes”, a program designed to discourage drinking and driving among the high school population. REMSA participates in such things as American Heart Association’s Sidewalk CPR and Heart Walk events. REMSA also asks each individual who comes to our office to recertify or reaccredit or reauthorize to complete a Customer Satisfaction survey.

Risk Management

REMSA fully investigates all complaints and issues regarding patient care or on-scene communications issues that are brought to our attention. These incident reviews are tracked and recorded and kept in a secure location. All incident reviews are protected from disclosure by the California Evidence Code 1157 and 1157.7.

During annual inspections of each provider in Riverside County, records are reviewed to ensure compliance with Occupational Safety & Health Administration (OSHA) regulations.

Communications

ReddiNet is the primary emergency communications system used by all hospitals in Riverside County to communicate with REMSA, with other hospitals, and with four of the dispatch agencies in Riverside County. Each hospital is required to have a dedicated satellite internet based unit specifically for ReddiNet. Various drills (MCI and message drills) are held periodically throughout the year, run either by REMSA or by the hospitals initiating drills themselves. Hospitals are expected to respond to bed capacity polls within 2 minutes, whether those polls are a drill or an actual MCI. ReddiNet is also used to communicate diversion status to the EMS System. REMSA allows ambulance diversion only for Trauma or for Internal Disaster, both of which must comply with specific parameters. Stroke diversion will be implemented on April 1, 2014 when the Stroke System is implemented.

LiveProcess serves as one of our interoperable communication systems. It is web-based and all 17 hospitals, six SNF/LTCs, 3 Clinicas de Salud and 10 Ambulatory Care Centers utilize the system as it is specifically designed for emergency management for healthcare facilities. LiveProcess functions include: bed tracking, information sharing, NIMS, resource and education tracking. The system assists Healthcare Facilities in their emergency management programs by providing tools to assist with the development of effective emergency management and operational plans, mitigating treats and developing sufficient response activities during an event to ensure the safety of patients and hospital staff. The system is also used for communication between the Riverside County Department of Public Health Departmental Operations Center (DOC) and Hospital Command Centers when activated.

WebEOC serves as another interoperable communication system. The purpose of WebEOC is to communicate with the County EOC. It is also used in the Riverside County Department of Public Health DOC to post significant events and provide situational status for the DOC staff.

Duty Officer/Duty Chief program – REMSA has a Duty Officer on call twenty-four (24) hours per day, seven (7) days per week to respond to requests for help from the EMS System, such as large scale incidents, resource requests from the field, extended ambulance delays at hospitals impacting the EMS System, and other such issues. The Duty Officer is one of several EMS Specialists in REMSA. If the issue is complicated, political, or large, the EMS Duty Officer notifies the Duty Chief (the EMS Agency Director, Assistant Director, or Senior EMS Specialist) on call. Both the Duty Officer and the Duty Chief can be contacted via a single phone number given out to all EMS providers and hospitals in Riverside County. During a large event, REMSA has an EMS Communications Center (EMS COMM) in the EMS Agency's office, which can be immediately activated and staffed by the Duty Officer, the Duty Chief, and various other personnel from REMSA and from the Public Health Emergency Preparedness and Response branch.

Dispatch – Riverside County has a total of **17** Primary Safety Answering Points (PSAP), and one secondary PSAP. 9-1-1 calls typically go initially to one of **17**Public Safety Answering Points (PSAPs), and are then routed to a secondary PSAP for dispatch of first responders and ambulances. The secondary PSAP routes the call to the contracted ambulance provider for the area. Riverside County's largest provider, Riverside County Fire

Department, dispatches for most of the County, and utilizes Pro QA, a dispatch software that standardizes the case entry and key questioning, identifying the appropriate determinant code for each case, and displays the response configuration for that particular type of call. It also lists instructions that dispatchers may give to the caller. Two other fire departments operate as Emergency Medical Dispatch as well; Riverside City Fire Department also utilizes Pro QA software. Corona Fire Department utilizes a home grown system based upon the Pro QA software, which is reviewed and approved by REMSA. Other city fire departments, including Palm Springs, Murrieta, Cathedral City, and Hemet all dispatch a fire engine Code 3 (lights and sirens) to all 9-1-1 requests for medical aid. The city of Blythe does not dispatch first responders, and the city is served by the contracted ambulance service provider.

There are five major types of radio and data communications systems that are currently being used for medical/ health communications in Riverside County (800 MHZ, VHF, UHF, Cellular and Data/ReddiNet). The medical communications system supports the operational and administrative needs of the EMS systems execution of the following mission critical responsibilities of the EMS Agency:

The trunked 800 MHZ (M/A-COM) system is designed to be used for disaster communications by the Public Health Emergency Preparedness and Response (PHEPR) Branch. This system is primarily used by the Riverside County Sheriff's Department and is being replaced with the Public Safety Enterprise Communications system (PSEC). PSEC is a collaborative body comprised of Motorola, Riverside County IT (RCIT), Riverside County Fire, Riverside County Sherriff and many other 800 MHZ system users. The new PSEC system will be activated in 2014.

The VHF system is designed to be used for day-to-day ambulance dispatch by American Medical Response countywide (Med Net 2, Med Net 3, and Med Net 4). In addition to day-to-day ambulance dispatch, Med Net 1 is being used as the primary radio frequency for online medical direction and day-to-day ambulance to hospital medical communication.

The UHF system is designed to be the primary method used for day-to-day radio communications between paramedic and Base Hospital Physicians. The system is in poor condition and most of the Riverside County EMS providers are not using it. The Riverside County EMS Agency does have a policy which regulates the use of these frequencies however the authorized optional use of cellular telephones has led to the infrequent use of the UHF system.

The private cellular networks are the current and most convenient method for prehospital providers to contact receiving and base hospitals for online medical direction and general communications. It is the position of the Riverside County EMS Agency that "Cell Phones" should not be a primary means of communication between Paramedics and Base Hospitals for the purposes of online medical control. Simulated and real world emergencies have shown that cellular networks are frequently unreliable during large scale incidents and during disasters.

Interfacility Transfers – REMSA has Policy #5501 (Interfacility Transfer) which delineates responsibilities of the transferring hospital, the receiving hospital, and the permitted ambulance company regarding interfacility transfers. Specialty Centers in Riverside County (Trauma, STEMI, and Stroke in 2014) are expected to be in compliance with all EMTALA requirements, including accepting specialty patients as a higher level of care as long as the specialty center has the capacity to care for these patients. All interfacility transfers must include physician to physician contact between the sending and the receiving physicians, and this contact must be clearly documented in the sending hospital's records. Time critical interfacility transfers requiring ALS or CCT services should have a reasonable response time of one hour in the absence of previously agreed upon contractual obligations. Permitted Helicopters may be utilized as necessary for such transfers. As an alternative to a CCT service or a helicopter, the sending hospital has the option of sending one of their own nurses along on a BLS or ALS ambulance to monitor the patient with needs exceeding the scope of practice of a paramedic or an EMT. If an ALS service is requested for the transfer, the sending physician must submit written orders designating the precise level of care deemed necessary during the transport. These orders shall be in accordance with accepted REMSA paramedic protocols and policy and within the state-recognized paramedic scope of practice.

Controlled Substances – All Advanced Life Support providers and Critical Care Transport providers must have controlled substances policies and procedures that are in compliance with The Controlled Substances Act and Title 22. This includes the ordering; receipt and accountability; master supply storage, security and documentation; labeling and tracking; vehicle storage and security; usage procedures and documentation; reverse distribution; disposal; restocking; and transfer or exchange between agencies and/or services of all controlled substances utilized by the service. These policies/procedures must also include mitigation of suspected tampering or diversion, including controlled substance testing; discrepancy reporting; tampering, theft and diversion prevention and detection; and usage audits. These policies and procedures must be included in each provider's CQI plan as an appendix.

EMS CQI Team

The EMS CQI Team is the central repository of local EMS system information as it relates to EMS CQI Program activities. The CQI Team includes, but is not limited to, the following representatives:

- The REMSA Medical Director
- The REMSA Director/Assistant Director
- The REMSA CQI Coordinator
- The REMSA Education Coordinator

The CQI Team meets every 2 weeks and reviews EMS CQI activity occurring within Riverside County EMS System.

The responsibilities of the EMS CQI Team include:

1. Prospective
    a. Comply with all pertinent rules, regulations, laws and codes of Federal, State and County applicable to emergency medical services.

b. Coordinate prehospital quality improvement committees.
c. Plan, implement and evaluate the emergency medical services system including public and private agreements and operational procedures.
d. Implement advanced life support systems and limited advanced life support systems.
e. Approve and monitor prehospital training programs.
f. Certify/authorize/accredit prehospital personnel.
g. Establish policies and procedures to assure medical control, which may include dispatch, basic life support, advanced life support, patient destination, patient care guidelines, and quality improvement requirements.
h. Facilitate implementation by system participants of required Quality Improvement plans.
i. Design reports for monitoring identified problems and/or trends analysis.
j. Approve standardized corrective action plan for identified deficiencies in prehospital and base hospital personnel.

2. Concurrent
    a. Site visits to monitor and evaluate system components.
    b. On call availability for unusual occurrences, including but not limited to:
        i. Multi-casualty Incidents (MCI)
        ii. Ambulance Diversion
        iii. Ambulance delays at hospitals
        iv. EOC/DOC activations
        v. Medical facility evacuations
3. Retrospective
    a. Evaluate the process developed by system participants for retrospective analysis of prehospital care
    b. Evaluate identified trends in the quality of prehospital care delivered in the system
    c. Monitor and evaluate the Incident Review Process.
4. Reporting/Feedback
    a. Evaluate submitted reports from system participants and make changes in system design as necessary
    b. Provide feedback to system participants when applicable or when requested on QI issues.
    c. Design prehospital research and efficacy studies regarding the prehospital use of any drug, device, or treatment procedure where applicable.

EMS CQI Technical Advisory Group (TAG)

In 2007, REMSA chartered a multidisciplinary CQI Technical Advisory Group, with the following positions:

- The REMSA Director/Assistant Director
- The REMSA CQI Coordinator
- The REMSA Education Coordinator
- Two representatives from fire departments providing medical first responder services in Riverside County, who shall be selected by the Riverside County Fire Chiefs Association

- Two representatives from an approved private ALS ambulance service in Riverside County, one from the east side of the county, one from the west side
- One representative from a BLS/CCT ambulance company selected by REMSA
- One representative from a REMSA approved Air Ambulance Company, selected by the Air Ambulance(s)
- Two representatives from the Prehospital Liaison Nurses (PLNs) group, one from the Desert area and one from Western Riverside County, selected by the PLN group.
- One representative from a Public Safety Answering Point (PSAP), to include Emergency Medical Dispatch, selected by REMSA
- One representative from a REMSA approved Paramedic Training Program, to be selected by the Paramedic Training Program Directors
- One representative from a REMSA approved EMT Training Program, to be selected by the EMT-I Training Program Directors.

All representatives will serve a term of two (2) years and will select replacements if they must discontinue service.

Responsibilities of the CQI TAG include:

1. Prospective:
    - Attendance at TAG meetings. If a representative is unable to attend a meeting, he or she is responsible to have a replacement to represent his/her agency.
    - Prepare and follow-up as appropriate for TAG meetings.
    - Disseminate the information discussed at TAG meetings to the represented group.
    - Maintain responsibility for monitoring, collecting data on, reporting on, and evaluating state and locally required and optional EMS System indicators from the EMS providers and hospitals within the jurisdiction of the Riverside County EMS Agency.
    - Identify and develop Riverside County EMS specific indicators for system evaluation.
    - Re-evaluate, expand upon, and improve local and state required EMS system indicators annually or as needed.
    - Prepare plans for improving the Riverside County EMS Agency's CQI program.
    - Establish a mechanism to incorporate input from EMS provider advisory groups for the development of performance improvement plan templates.
    - Recommend the chartering of Quality Task Forces and review of their reports.
    - Seek and maintain relationships with all EMS participants.

The EMS CQI TAG meets quarterly, according to a planned agenda. Results from indicators are reviewed, and either continued or retired, and new indicators selected by the committee, based on identified trends. California EMS Authority Core Measures are required from all providers and Base Hospitals. Prehospital Receiving Centers (PRCs) are strongly encouraged to participate in QI committees and in data collection. The first 30 minutes of each meeting is dedicated to the Data Group, which advises the CQI TAG on data issues.

One of the primary functions of the CQI TAG is Root Cause Analysis (RCA). All system data and information is passed to the CQI TAG, who performs an RCA. Once that is completed, the issue is passed to a specific group

(Stroke System Committee, STEMI System Committee, MCI Group, HEMS, TAC, etc.) to more fully investigate the issue. Once the group has reached consensus on the issue, their recommendations are passed back to the CQI TAG. Outputs of the CQI TAG are:

- Data for reporting on REMSAs website
- A written synopsis of the issue and resolution for posting on REMSA's Lessons Learned Center
- Confidential Performance Improvement Plans, for issues involving a specific organization or individual. These PIPs are only used for remediation, never for disciplinary issues.

The flow of system information through the CQI TAG, to specialty groups and back, and the outputs are shown in Appendix B.

REMSA makes a distinction between system issues ("common cause") and individual issues ("special cause"). REMSA looks at the system first to identify a system event. Data is used to identify the differences between the two. REMSA saves the data collected on each investigation, because special cause could potentially be an early herald of a common cause issue. REMSA will always look at a first event as an early herald of failure for the system.

Other Committees that influence and direct Quality Improvement

- Prehospital Medical Advisory Committee – The purpose of the Prehospital Medical Advisory Committee (PMAC) is to provide advice and expertise to the County of Riverside EMS Agency and to enhance cooperation between the multiple EMS system participants on administrative, operational, and emergency medical issues. Active membership consists of representatives from hospitals, fire departments, law enforcement, ambulance service providers, and various committees. Field personnel are welcome to attend, and are formally represented by an EMT-at-Large and a paramedic-at-large.
- The Emergency Medical Care Committee – The purpose of the Emergency Medical Care Committee (EMCC) is to advise the Board of Supervisors on all aspects of emergency medical care within the County and to report to the Board of Supervisors the observations and recommendations of the EMCC concerning the feasibility and content of emergency medical care programs within the County. The composition of the EMCC is determined by Resolution 2001-358, dated December 18, 2001 and includes 15 members appointed by the Board of Supervisors representing hospitals, prehospital providers, the Board of Supervisors, fire departments, city managers, and law enforcement.
- HEMS CQI Committee is an open committee of participants from permitted air and ground ambulance providers, fire departments, and hospital personnel. Each helicopter run from the scene, excluding interfacility transfers, is reviewed for such things as scene times, appropriateness of use of the helicopter, documentation, overall provider care, and outcome.
- STEMI System Committee is an open committee of participants from ambulance providers, air providers, fire departments, Emergency Department and Cardiac Catheterization Laboratory personnel. Data is collected and aggregated by REMSA for presentation and discussion at this quarterly meeting. System issues are discussed as well.

- Stroke System Committee is an open committee of participants from ambulance providers, air providers, fire departments, Emergency Department and Specialized Stroke/Neurology personnel. Currently the group meets every other month to develop the prehospital Stroke System in Riverside County, including development of policies and checklists for site visits. The Prehospital Stroke System will be implemented beginning April 1, 2014. At that time, specific data will be collected and reported at the meetings, which will decrease to quarterly meetings.
- Ambulance Zone meetings are held quarterly for each of Riverside County's 12 zones. Response time compliance for the contracted ambulance provider is reviewed with all interested parties, and system issues identified are discussed with the participants. Participants include ambulance companies, fire departments, city managers, hospital personnel and other interested parties.
- Trauma Audit Committee – discussed under Clinical Care and Patient Outcome above.
- The Data Group is comprised of personnel from fire departments, ambulance providers and hospitals assigned by their organization to be responsible for data related activities and other topics including, but not limited to, research. The group meets quarterly, in conjunction with the CQI TAG. The CQI TAG discusses issues and recommends to REMSA what variables in the EMS System should be monitored. The Data Group identifies the data that is needed to monitor the variables decided upon by the CQI TAG. The Data Group assists the County and providers with the transition to NEMSIS 3.0.

Communications and relationships

REMSA has established relationships with all EMS stakeholders, including, but not limited to, ALS, BLS and CCT ambulance companies, air ambulance providers, Base Hospitals, Prehospital Receiving Centers, Fire Departments, city councils, and the Riverside County Board of Supervisors. REMSA works under the philosophy that we collaborate when we can, regulate when we must. This is evident in the development of specialty programs, such as our STEMI and Stroke programs, our Trauma Committees, our Helicopter EMS (HEMS) committee, our Data Collection Group and our Policy Review Forum. All of these meetings are comprised of EMS constituents, working together collaboratively to develop and monitor the specialty programs and to review policies and data collection in detail. All of these committees are open to EMS stakeholders, including EMTs, paramedics, physicians, and MICNs, because we believe that the more people that contribute to a program, the stronger that program is. It also ensures "buy-in" from the EMS community.

REMSA works closely with our Riverside County Public Health Emergency Preparedness and Response (PHEPR) branch, which coordinates all disaster responses, preparedness, training, and drills. REMSA also partners with the Riverside County Injury Prevention Program, which initiates many community education projects, such as bicycle helmet give-aways and infant car seats, education and resources on such things as teen suicide, safe routes to school, drowning prevention, and bicycle safety.

EMS issues are relayed to the EMS community in a variety of ways:

- PMAC - CQI reports from Specialty Centers (Trauma, STEMI, Stroke and HEMS) are given to the EMS community as a whole during the PMAC meetings, which are held five (5) times per year.

- EMCC - CQI reports on such things as ambulance response times and contract compliance are given at the EMCC meetings. Performance Excellence reports are also given to EMCC, to ensure that the Board of Supervisors is kept apprised of the excellence of our EMS System.
- REMSA has established an on-line forum for various committees and sub-committees to discuss specific issues. At the time of this writing the various groups are being set up on the forum, and include such groups as STEMI System Committee, Stroke System Committee, Data Group, the Policy Review Forum, and the CQI TAG. Each of these groups has separate meetings, but the forum discussions help to streamline the actual meetings, allowing for votes and action items to be completed at the meetings while much of the actual discussion takes place via the on-line forums.
    - A calendar is set up on the forum, showing all relevant meetings, conferences, base hospital meetings, etc. This on-line calendar is open to anyone to view, and assists REMSA in scheduling meetings.
- REMSA requires all hospitals to subscribe to Rapid Emergency Digital Data Information Network (ReddiNet). ReddiNet is the essential emergency communications tool for all participants. ReddiNet has a separate terminal which is run via a satellite internet connection. Its function is the dissemination of authorized EMS system operational information including diversion status, multiple casualty incident management, disaster assessment communications, patient tracking/alert, disease surveillance, public health alerts, and bed capacity. Riverside County's two largest medical dispatch centers, AMR and Riverside County Fire Department's Emergency Communication Center, are also on ReddiNet. All providers are welcome to subscribe to ReddiNet, but are not required to do so.

Goals/Measures – Looking toward the future

Strategic Goals

Goal	Objectives to Achieve Goal	Metric	Status
Goal 1 Develop and implement programs and processes for the evaluation and improvement of the EMS system	Establish CQI as part of the day-to-day operations of the EMS system	EMS Agency's CQI plan approved by the State EMSA	REMSA's CQI plan was approved for 5 years by EMSA in 2008
		100% of CQI Plans are approved	REMSA made an approved CQI plan part of the permitting process in 2011 and 2012. 100% of Providers, Fire Departments and Base Hospitals have a CQI plan on file at REMSA that has received REMSA's approval
		100% of provider agencies submit annual summaries on their CQI plans	
	Establish a Countywide data collection system and processes	100% of providers have established CEMSIS as their data set	All providers, with the exception of 2 small fire departments, utilize the Countywide data collection system. This system is CEMSIS Gold compliant. Our largest transport provider is currently on a different system, which is also CEMSIS Gold compliant.
		100% of providers submit data to REMSA	REMSA is able to access the data system to pull reports for all fire departments except the 2 small fire departments mentioned above. Our largest ALS transport provider submits data to REMSA regularly. Base Hospitals submit data on STEMI and Trauma patients and as requested.

Goal	Objectives to Achieve Goal	Metric	Status
Goal 1 Develop and implement programs and processes for the evaluation and improvement of the EMS system (continued)	CQI Committee will analyze data and generate recommendations for system improvement	Output provides a clear data driven CQI linkage to education training, protocol development and modifications of CQI plans	CQI TAG developed Performance Standards for low frequency/high risk skills in 2010 to standardize the performance of those skills.
		EMS system dashboard in place	
		EMS research to be published	
	Evaluate the need for specialty care centers/programs (i.e., stroke centers, EMD, Alternate Care Sites, Disaster protocols – clinical and dispatch)	Improved outcomes of patients that go to specialty care centers	REMSA has had a trauma system in place for many years. Peer review takes place at Trauma Audit Committee, and data is reported to the EMS system on a regular basis. REMSA established a STEMI system in 2007. Meetings take place quarterly to review data and discuss improvements to the system. A stroke system is being developed, and will begin on April 1, 2014.
		100% of all dispatch centers use EMD	Approximately 80% of medical dispatch agencies in Riverside County utilize EMD.

Goal	Objectives to Achieve Goal	Metric	Status
Goal 2 Improve compliance with policies, standards, agreements and regulations	Develop and implement a contracts/contractor monitoring program to ensure up to date compliance with all written agreements	Measureable improvement in compliance with contract requirements	
		Involvement in all EMS activities by all EMS providers.	Meetings with EMS system stakeholders can be found on page 18 of this document, or in Appendix D.
		Completion of meetings and ride-alongs during specified time frames	
		Adherence/improved compliance with agreements, regulations and P&P measured through focused audits and CQI programs	REMSA has performed 2 compliance audits on Base Hospitals, in 2010 and in 2013. Audits for Prehospital Receiving Centers are expected to be done in 2014. As part of the permitting process, providers all receive a site visit and documentation review by REMSA annually.
	Implement standardized programs through Policy		REMSA has developed and implemented a Base Hospital policy and Prehospital Receiving Center policy.
Goal 3 Improve the capabilities and operating efficiency of the agency	Use technology to improve efficiency and customer service	Establish electronic/ on-line certification process	REMSA is working with our data vendor to make this a reality. Implementation is anticipated by December 31, 2014.
		Migrating to paperless system.	All providers are required to be on the county's data system January 1, 2015. On that date, hospitals will all have access to download ePCRs for patients that arrive at their facilities.
		Digitally archived library of paper documents	REMSA is in the process of digitally archiving paper documents.

Goal	Objectives to Achieve Goal	Metric	Status
Goal 3 Improve the capabilities and operating efficiency of the agency (continued)		Utilize web environment to augment face-to-face meetings	Riverside County Department of Public Health (RCDOPH) has purchased a subscription to WebEx, and on-line meeting software system that is available for REMSA to use.
		Social Media	REMSA is exploring the possibility of communicating with EMS Stakeholders through such social media as Facebook and Twitter
	Cross train EMS staff in order to perform other staff member responsibilities	Decrease in time for completion of common tasks	
	Obtain a larger office	Actual move to a larger office	In 2009 REMSA moved to a larger office. We are currently in development phase of a second move to another larger office.
	Realize the potential of staff	Annual evaluations, development of staff portfolios	REMSA staff is evaluated annually
	Continue to develop staff consistent with the mission statement	All staff positions filled and one additional position added	Since 2007, REMSA staff has increased by one staff member each year.
Goal 4 Develop educational training tools and programs to facilitate consistency in all components of the EMS system	Design and implement a comprehensive and consistent orientation program	All providers will be using the same training and orientation outlines	REMSA is in the process of hiring an EMS Specialist whose focus will be training and education. We anticipate that this position will be filled by February 2014.
	Ensure consistency between training programs and congruency with the National Educational Standards	All providers will have the same interpretation of the Policy and Procedures	See comment above

Goal	Objectives to Achieve Goal	Metric	Status
Goal 4 Develop educational training tools and programs to facilitate consistency in all components of the EMS system (continued)	Develop processes that link educational standards to CQI data		New EMS Specialist starts work at REMSA on May 1, 2013. Her primary focus will be education and training.
Goal 5 In partnership with PHEPR, establish a system-wide process for optimal EMS response to multi-casualty incidents, emergencies and disasters	Assess current EMS planning, response and recovery strategies	Master plan that integrates all planning and response activities for the EMS Agency and PHEPR	Not yet started
	Develop and implement processes for EMS Agency and PHEPR response activities during medical/health incidents		Not yet started
	Establish standards of care for EMS and PHEPR operations during a disaster	Promulgation of policies and protocols	Not yet started
Goal 6 Develop and implement a system-wide EMS communications system	Assess current plans and infrastructure	Report from consultant	REMSA's senior EMS Specialist has been working with other public safety organizations to implement EMS into the PSEC system
	Evaluate current and future EMS system needs		
	Establish a new plan that addresses current and future needs	Completion of requirements as outlined in the report/	Not yet started
Goal 7 Refine the trauma plan inclusive of integration into a regional trauma system	Assess and evaluate current and future plans ain infrastructure	Establish regional patient destination policies	
	Regional approach		
	Establish a new plan that addresses current and future needs		
	Link injury prevention activities to CQI	Improve the continuum of care	
Goal 8 Develop a REMSA Marketing Plan	Maintain communications with system participants	Create and share contract review documents with providers	
	Facilitate strong interagency relationships and cooperative partnerships	Share compliance data with stakeholders	

EMS CQI Goals

The goals of the EMS CQI program, as stated in the CQI TAG charter from October 3, 2007, are:

Goal	Objectives to Achieve Goals	Metric	Status
Goal 1 **Evidence based changes**	Analyze and publish outcomes of EMS delivery to stakeholders	% of total patients where we are able to get outcome data (STEMI, Trauma, ROSC)	STEMI and Trauma data is reported at least annually at PMAC
	Establish pre-hospital performance benchmarks	Total number of performance standards; total training hours spent on performance standards	Performance Standards have been written for identified low-frequency/ high risk skills
	Establish a system-wide data collection system	% of providers utilizing Sansio. Compliance % (% of runs utilizing Sansio)	Sansio is required for all providers beginning Jan 1, 2015
	Gather and review research in current literature for application to education and practice	# of new medications/skills added to Riverside County scope of practice since 2008.	Based on current literature and research, several new medications/procedures have been added to the REMSA scope of practice for prehospital personnel (i.e., Zofran, Intraosseous access, CPAP).
Goal 2 **Improve relationships**	Exchange of information between providers and agencies	Total number of EMS meeting hours (broken down by topic) x (# of meetings) x (# of participants) – total meeting hours	All providers and hospitals are regularly invited to participate in various committees that review programs. Data sharing occurs regularly at these meetings (i.e., HEMS CQI, STEMI, Stroke meetings, Zone meetings)

Goal	Objectives to Achieve Goal	Metric	Status
	Facilitate opportunities for collaborative education and training	# of skills labs offered per year (begin 2014)	Skills labs are arranged into modules that all providers and nurses are able to take at any location.
	Resolve issues at lowest possible level	Total # of incidents investigated by REMSA per year 2010 - 2013	Providers have the first right of refusal re: investigating incidents
Goal 3 Utilize CQI outcomes to modify and enhance EMS delivery and educational programs	Enhance EMS educational programs	# of REMSA sponsored educational offerings per year	REMSA is in the process of hiring an EMS Specialist specifically for education
	Evaluation and improvement of equipment used in the field	# of new equipment/procedures/meds allowed in Riverside County scope of practice.	Policy Review Forum discusses new equipment/procedures/meds. This is brought back for discussion at REMSA with medical director
	Evaluation and improvement of field treatment protocols	% of policies reviewed	Policy Review Forum is open to all EMS System stakeholders. Policy format and all policies were re-written in 2011.
	Evaluation of low frequency and high risk procedures	% of paramedics, EMTs and MICNs who have attended a skills lab within the previous 2 years.	Performance Standards have been written for all identified low frequency/ high risk procedures. Paramedics, EMTs and MICNs are required to attend and pass a skills lab with these skills every 2 years.

Goal	Objectives to Achieve Goal	Metric	Status
Goal 4 **Recognize excellence**	Identify forums and formats for public recognition of excellence (e.g., board of supervisors meeting, public meetings, newspapers, etc.)	# of Performance Excellence certificates awarded	Anyone can go to REMSA website and write a Performance Excellence report on anyone. The recipient receives a letter of congratulations, a certificate, and is announced publicly at EMCC.
	Develop process for communicating examples of excellence	# of Performance Excellence certificates awarded	Performance Excellence recipients are announced at EMCC, which has representatives from the Riverside County Board of Supervisors as voting members.
Goal 5 **Provide forum for sharing**	Share CQI Plans and Processes	% of providers and Base Hospitals with approved CQI plans. % of providers and Base Hospitals who have updated their CQI plans.	All providers and Base Hospitals are required to have an approved CQI plan on file with REMSA. All participants are informed upon plan approval that their CQI plans may be shared with others so that others can utilize best practices
	Develop and implement peer review process	# of charts audited at TAC	The Trauma Audit Committee is made up of physicians and nurses who perform peer review.

Indicators

Indicators in red are REMSA mandated indicators. Indicators in black are EMSA mandated indicators.

Indicators selected for the 2013-2014 year include the following:

CCR Title 22, Div 9, Chap 12 100404	SET NAME	SET ID	PERFORMANCE MEASURE NAME	YEAR BEGIN TO BE MEASURED	FREQ OF DATA COLLECTION	DATA COLLECTOR/ ANALYZER	REQUIRED BY EMSA/ REMSA/ PROVIDER
A Personnel	Certification/licensure (n=1)	RPER-1	Certification/authorization/licensure for all EMS personnel is current	2013	MONTHLY	PROVIDERS	REMSA
B Equipment and Supplies	Narcotics check sheets (n=1)	RNARC-1	Narcotics are checked daily, and narcotic check sheets are completed daily	2013	MONTHLY	PROVIDERS	REMSA
C Documentation	ePCRs (n=2)	RDOC-1	Each patient encounter shall have at least one ePCR completed.	2013	MONTHLY	PROVIDERS	REMSA
		RDOC-2	Provider ePCRs shall contain the call number of the First Responder's ePCR on each patient	2013	DAILY	PROVIDERS	REMSA
D Clinical Care and Patient Outcome	Trauma (n=2)	TRA-1	Scene time for severely injured trauma patients	2013	MONTHLY	PROVIDERS	EMSA
		TRA-2	Direct transport to trauma center for severely injured trauma patients meeting criteria	2013	MONTHLY	PROVIDERS	EMSA
	Acute Coronary Syndrome (n=5)	ACS-1	Aspirin administration for chest pain/discomfort	2013	MONTHLY	PROVIDERS	EMSA
		ACS-2	12 Lead ECG performance	2013	MONTHLY	PROVIDERS	EMSA
		ACS-3	Scene time for suspected heart attack patients	2013	MONTHLY	PROVIDERS	EMSA
		ACS-4	Advance hospital notification for suspected acute coronary syndrome	2014	MONTHLY	PROVIDERS	EMSA
		ACS-5	Direct transport to PCI center for suspected acute coronary syndrome (ACS)	2013	MONTHLY	PROVIDERS	EMSA

CCR Title 22, Div 9, Chap 12 100404	SET NAME	SET ID	PERFORMANCE MEASURE NAME	YEAR BEGIN TO BE MEASURED	FREQ OF DATA COLLECTION	DATA COLLECTOR/ ANALYZER	REQUIRED BY EMSA/ REMSA/ PROVIDER
	Cardiac Arrest (n=4)	CAR-1	AED application prior to EMS Arrival	2014	MONTHLY	PROVIDERS	EMSA
		CAR-2	Out-of-hospital cardiac arrests return of spontaneous circulation	2013	MONTHLY	PROVIDERS	EMSA
		CAR-3	Out-of-hospital cardiac arrests survival to emergency department discharge	2013	MONTHLY	PROVIDERS	EMSA
		CAR-4	Out-of-hospital cardiac arrests survival to hospital discharge	2013	MONTHLY	PROVIDERS	EMSA
	Stroke (n=4)	STR-1	Identification of suspected stroke in the field	2014	MONTHLY	PROVIDERS	EMSA
		STR-2	Glucose testing for suspected stroke patients	2013	MONTHLY	PROVIDERS	EMSA
		STR-3	Scene time for suspected stroke patients	2014	MONTHLY	PROVIDERS	EMSA
		STR-4	Advance hospital notification for suspected stroke	2014	MONTHLY	PROVIDERS	EMSA
	Respiratory (n=2)	RES-1	CPAP given for patients with respiratory distress	2014	MONTHLY	PROVIDERS	EMSA
		RES-2	Beta 2 agonist administration	2014	MONTHLY	PROVIDERS	EMSA
	Pediatric (n=2)	Ped-1	Pediatric asthma patients receiving bronchodilators	2013	MONTHLY	PROVIDERS	EMSA
		PED-2	Transport to pediatric trauma center	2013	MONTHLY	PROVIDERS	EMSA

CCR, Title 22, Div 9, Chap 12 100404	SET NAME	SET ID	PERFORMANCE MEASURE NAME	YEAR BEGIN TO BE MEASURED	FREQ OF DATA COLLECTION	DATA COLLECTOR/ ANALYZER	REQUIRED BY EMSA/ REMSA/ PROVIDER
E. Skills Maintenance and Competency (n=2)	Pain intervention (n=2)	PAI-1	Pain intervention	2013	MONTHLY	PROVIDERS	EMSA
		PAI-2	Results of pain intervention	2013	MONTHLY	PROVIDERS	EMSA
	Performance of Skills (N=3)	SKL-1	Endotracheal intubation success rate	2013	MONTHLY	PROVIDERS	EMSA
		SKL-2	End-Tidal C02 –performed on any successful endotracheal intubation	2014	MONTHLY	PROVIDERS	EMSA
		RSKL-3	All MICNs, EMTs, and paramedics will attend and pass one skills lab, approved by REMSA, once per recertification cycle.	2014	MONTHLY	PROVIDERS	REMSA
		RSKL-4	All MICNs, EMTs and paramedics will attend one MCI class approved by REMSA, once per recertification cycle	2014	MONTHLY	PROVIDERS	REMSA
F Transporta-tion and Facilities	Response and Transport (n=3)	RST-1	Ambulance response time by ambulance zone (Emergency)	2013	MONTHLY	PROVIDERS	EMSA
		RST-2	Ambulance response time by ambulance zone (Non-Emergency)	2013	MONTHLY	PROVIDERS	EMSA
		RST-3	Transport of patients to hospital	2013	MONTHLY	PROVIDERS	EMSA
G Public Education	Cardiopulmonary Resuscitation	PUB-1	Out-of-hospital cardiac arrests receiving bystander (non-EMS Personnel/Responder) CPR	2014	MONTHLY	PROVIDER	EMSA

CCR, Title 22, Div 9, Chap 12 100404	SET NAME	SET ID	PERFORMANCE MEASURE NAME	YEAR BEGIN TO BE MEASURED	FREQ OF DATA COLLECTION	DATA COLLECTOR/ ANALYZER	REQUIRED BY EMSA/ REMSA/ PROVIDER
H Risk Manage-ment	Against Medical Advice	RAMA	% of all 9-1-1 calls that result in the patient refusing medical treatment and/or transport against medical advice	2014	MONTHLY	PROVIDERS	REMSA

State indicators were selected based upon requirements from the California EMS Authority. REMSA indicators were selected primarily because of the ease of capturing the data. These are initial indicators, and will be used primarily to accustom EMS System participants to the process of collecting and aggregating data on a county-wide scale. Once REMSA has seen that processes for the data collection and aggregation are in place, more meaningful indicators will be measured.

Evaluation of Indicators

The CQI TAG meets quarterly to review the data obtained from the indicators, identify trends, and to make recommendations on other potential issues in the EMS System that may indicate a need to develop and monitor an indicator. Once the indicator is written and validated to ensure that it results in reliable data being collected which answers the question that is being asked, the CQI TAG meets to review the results of the indicators. The REMSA QI Coordinator will collect data on all indicators monthly and puts the results into a format for interpretation by the CQI TAG. Data will be collected utilizing the County-wide data collection system, Sansio. Any providers not utilizing Sansio will be required to submit the data on a monthly basis to REMSA. REMSA will work with the provider that is out of compliance with the data system requirements to assist them to begin utilizing the data system. Results of the indicators, shown on charts presented to the CQI TAG, will be made available by posting them on REMSA's website at www.rivcoems.org.

For each CQI TAG meeting, the following agenda will be utilized:

1. Review of prior meeting action items.
2. Presentation of indicators and results/trends.
    a. For each indicator that the TAG reviews, the following process will be followed:
        i. Identify the objectives of the evaluation
        ii. Present the indicators and related EMS information
        iii. Compare performance with goals or benchmarks'
        iv. Discuss performance with peers/colleagues
        v. Determine whether improvement or further evaluation is required
        vi. Establish a plan based upon that decision.
        vii. Assign responsibility for post-decision action plan, if any.

b. Examine correlations between/among trends
c. Acknowledgement of positive trends; discussion of unsatisfactory trends
d. Receive reports from Quality Task Forces, if any.
e. Discuss changes needed to indicators.
f. Recommend the chartering of Quality Task Forces, if any.
g. Summarize action items identified at this meeting.
h. Recommend training/educational needs.
i. Evaluation of the meeting.

REMSA will have and pursue a technically accepted way of analyzing our data to distinguish between common cause and special cause.

Action to Improve

The Riverside County EMS Agency utilizes several models for quality improvement, depending upon the issue being evaluated, and the group of people involved. Models used include, but are not limited to:

The Plan-Do-Study-Act (PDSA) model for quality improvement: The PDSA cycle is shorthand for testing a change. It is the scientific method, used for action-oriented learning. Use of PDSA cycles is a way of testing an idea by putting a change into effect on a temporary basis and learning from its potential impact. In utilizing this model, the Plan step 1 should take up the most time.

Step 1: Plan

Plan the test or observation

- State the objective
- Make predictions about what will happen and why
- Develop a plan to test the change (Who? What? When? Where?)

Step 2: Do

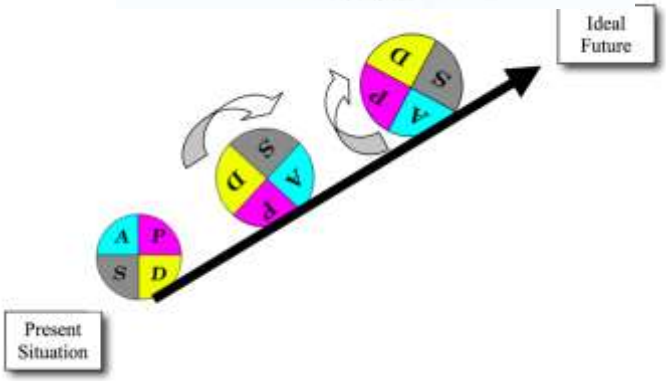
Try out the test on a small scale

- Carry out the test
- Document problems and unexpected observations.
- Begin analysis of the data.

Step 3: Study

Set aside time to analyse the data and study the results

- Complete the analysis of the data
- Compare the data to your predictions
    - Summarize and reflect what was learned.
    -



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Step 4: Act

Refine the change, based on what was learned from the test

- Determine what modifications should be made
- Prepare a plan for the next test

The Analysis, Design, Develop, Implement, Evaluate (ADDIE) model:

Phase I: Analysis

- Collect job and task data
- Compile a gross task list
- Develop a student target population description
- Select critical tasks
- Analyze each critical task

Phase II: Design

- Perform learning analyses on each selected task
- Select training sites for each task
- Develop behavioral objectives
- Construct criterion-referenced tests
- Sequence the instruction

Phase III: Development

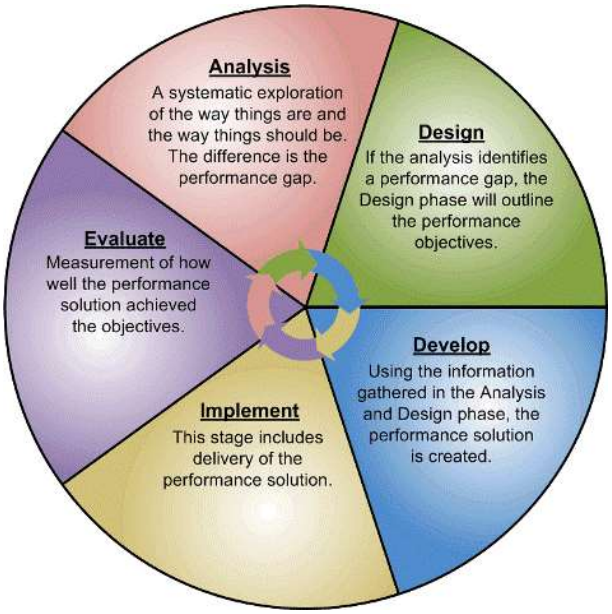
- Review/revise existing literature
- Select appropriate methods and media
- Develop all new course materials
- Validate all new course materials
- Develop an Instructional Management Plan

Phase IV: Implementation

- Implement tine Instructional Management Plan
- Conduct the Instruction

Phase V: Evaluation and Control

- Conduct external evaluations
- Assess data and revise the system



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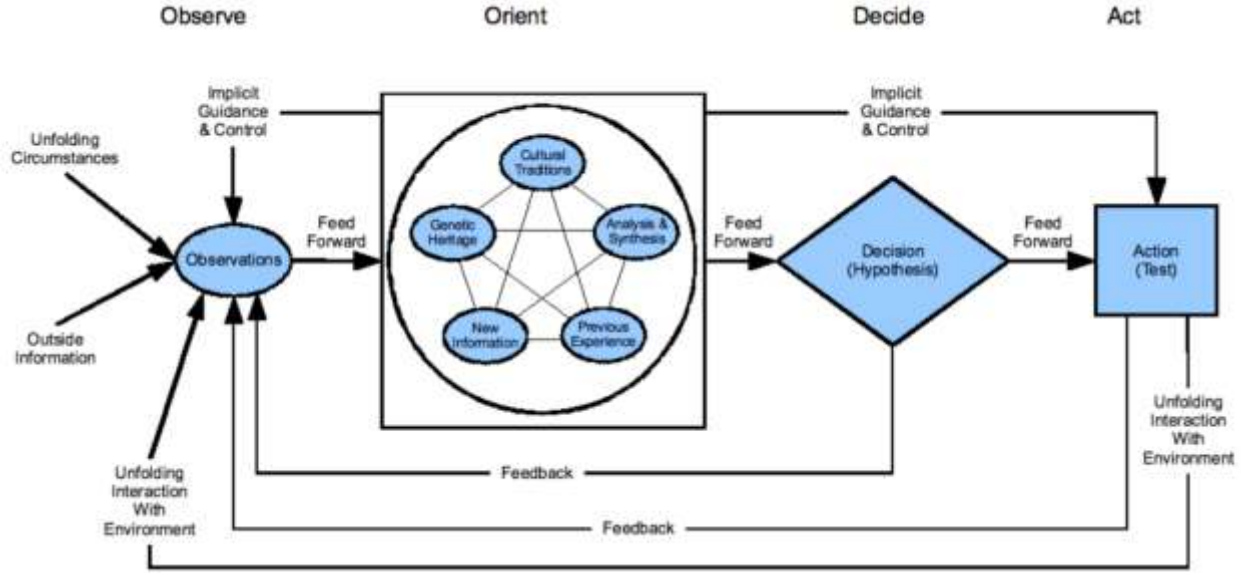
Observe, Orient, Decide, Act Loop



Stage 1: Observe

At this initial point in the loop, you should be on the look-out for new information, and need to be aware of unfolding circumstances. The more information you can take in here, the more accurate your perception will be. Like an F-86 pilot with a wide field of vision, you want to capture as much incoming data as possible. The kinds of questions you need to be asking are:

- What's happening in the environment that directly affects me?
- What's happening that indirectly affects me?
- What's happening that may have residual effects later on?
- Were my predictions accurate?
- Are there any areas where predication and reality differ significantly?

Stage 2: Orient

One of the main problems with decision-making comes at the Orient stage: we all view events in a way that's filtered through our own experiences and perceptions. Boyd identified five main influences:

- Cultural traditions
- Genetic heritage
- The ability to analyze and synthesize
- Previous experience
- New information coming in

Orientation is essentially how you interpret a situation. This then lead directly to your decision.

The argument here is that by becoming more aware of your perceptions, and by speeding up your ability to orient to reality, you can move through the decision loop quickly and effectively. The quicker you understand what's going on, the better. And if you can make sense of the situation and the environment around you faster than your competition, you'll have an advantage.

And, it's important to remember that you're constantly re-orienting. As new information comes in at the Observe stage, you need to process it quickly and revise your orientation accordingly.

Stage 3: Decide

Decisions are really your best guesses, based on the observations you've made and the orientation you're using. As such, they should be considered to be fluid works-in-progress. As you keep on cycling through the OODA Loop, and new suggestions keep arriving, these can trigger changes to your decisions and subsequent actions – essentially, you're learning as you continue to cycle through the steps. The results of your learning are brought in during the Orient phase, which in turn influences the rest of the decision making process.

Stage 4: Act

The Act stage is where you implement your decision. You then cycle back to the Observe stage, as you judge the effects of your action. This is where actions influence the rest of the cycle, and it's important to keep learning from what you, and your opponents

During its quarterly or other meetings, the TAG will identify indicators that signal a need for improvement and make recommendations for chartering a Quality Task Force, if needed. The CQI Team will select members and charter the Task Force with a specific objective for improvement. The Quality Task Force may utilize any of the aforementioned QI models, or they may select a different methodology, which must be approved by the CQI Team. The CQI Team will modify or accept and implement recommendations of the Quality Task Force for Performance Improvement Plans and prepare the report for distribution to the TAG. The CQI Team will also disband the Quality Task Force at the appropriate time.

Education and Training

Training and CQI go hand in hand. As the CQI model identifies trends and quantifies issues in the EMS System, the education specialist incorporates training programs directed at correcting opportunities identified in the CQI process. One example of this is in the development of Performance Standards.

The Training and Education Coordinator in REMSA sits on both the CQI TAG and the CQI Team. This ensures that the training component of each issue discussed in QI Committees is fully understood by the Training and Education Coordinator.

Currently, required education is provided by providers and base hospitals, and consists of:

- Basic Cardiac Life Support (BCLS)
- Advanced Cardiac Life Support (ACLS)

- Prehospital Trauma Life Support (PHTLS) or International Trauma Life Support (ITLS)
- Pediatric Advanced Life Support (PALS)
- Advanced Skills Verification Form
- Basic Skills Verification Form

Once a Performance Improvement Plan has been implemented, REMSA will standardize the changes within the appropriate policies and protocols. The REMSA Training Coordinator works with the Data/Policy Specialist to revise or write a policy as indicated. The new policy or revised policy is presented at the Riverside County Prehospital Medical Advisory Committee meeting for discussion and goes through the process delineated on page 11 under "Clinical Care and Patient Outcome".

The Education Specialist ensures that providers submit documentation that all training requirements have been met by all EMS system participants, usually twice pre year and on an as-needed basis. This is accomplished via training memos, training program development, or by train-the-trainer programs. Providers are ultimately responsible for ensuring that staff is trained to the specifications set by REMSA. The rosters and records of training are available to REMSA upon request.

Performance Standards

In 2009, Riverside County EMS Agency identified the issue of standardizing how data on skills was collected by each organization. We accomplished this by first identifying all skills that are performed in the field, and making a risk/frequency matrix (Appendix B) showing each skill. Because "low frequency" does not have a nationally standardized definition, we obtained agreement from all EMS Stakeholders that the definition would be "average less than 20 uses annually per EMT/paramedic". "High Risk" skills were defined as, "improper technique can cause harm to the patient." Next, we focused on the development of the Performance Standards for all skills in the "Low Frequency, High Risk" category. This process took 2 years to complete, and in 2010, the Performance Standards were added to the Riverside County Protocol Manual. Next, REMSA worked with the educators in Riverside County to separate all of the Performance Standards into specific modules, which would be adhered to by all organizations. This allows all EMTs, paramedics, and MICNs to attend any skills module offered by any organization, secure in the knowledge that they would obtain the same skills and the same training no matter where they took the skills labs. Beginning April 1, 2014, all paramedics and MICNs will be required to attend a skills lab covering all of the Performance Standards, and to present a Skills Verification Form, signed by a designated Skills Verifier, in order to reaccredit/reauthorize in Riverside County. REMSA felt it was important for MICNs to attend these skills labs as well as paramedics for two reasons, although many of the skills are not in the nursing scope of practice. First, it gives all MICNs a uniform experience working with many prehospital personnel, something that is not possible by requiring ride-alongs. Secondly, it was felt that the MICNs need to understand how difficult some of the skills are to perform when they order the skills on actual calls.

Future Development

REMSA plans for two levels of training:

1. Primary – also known as "new employee orientation". This needs to be standardized so that all employees new to the Riverside County EMS System receive the same orientation, which will not vary from provider to provider. Paramedic accreditation will be standardized.
2. Adaptive Competence and Expertise Program – This will be a course run by REMSA focusing on leadership and concurrent evaluation of EMS system participants. All Field Training Officers, MICNs and preceptors will be required to take this class, which will be certified by REMSA, with a certification card and certificate presented at the completion of the course.

Annual Update

The Annual Update is a written account of the progress of an organization's activities as stated in the EMS CQI Plan. An EMS Specialist in the Riverside County EMS Agency is responsible for annually updating the EMS Plan, in alignment with current EMS strategic goals. The CQI Coordinator will do an initial review of the CQI plan, identifying what did and did not work. The CQI Coordinator will work in conjunction with the EMS Specialist responsible for updating the EMS Plan to ensure that both the CQI Plan and the EMS Plan are focusing on the same objectives. Once both the CQI Plan and the EMS Plan have been reviewed in this fashion, the CQI Coordinator will present his/her findings to the TAG and to the CQI Team. The following chart will be the template for the presentation of the update.

Indicators Monitored	Key Findings/Priority Issues Identified	Improvement Action Plan/Plans for Further Action	Were Goals Met? Is Follow-up Needed?

As part of the annual update, the CQI Coordinator, the TAG, and the CQI Team will offer recommendations for changes needed in the CQI plan for the coming year, including priority improvement goals/objectives, indicators monitored, improvement plans, how well goals/objectives were met, and whether follow-up is needed.

A current CQI Plan will be submitted to the State EMS Authority every five (5) years.

Appendix A – Incident Investigation Forms

Incident Reporting Form

Revised 01-04-08

Date:_____ **Time:**_____ **Reporting Agency:**_____

Incident #:_____ **EMS Agency Incident #:**_____

Date of Incident: _____ **EMS Unit #:**_____

Level Incident: **Level III [ ]** **Level IV [ ]**

Investigator:_____

		Classification
Personnel Involved:	_____	_____
	_____	_____
	_____	_____
Other Agency(s) Involved:	_____	_____
	_____	_____
	_____	_____

EMS Notification: Y [ ] N [ ] **EMS Specialist:**_____

Verbal Date: _____ **Written Date:**_____

Check List for Submission to EMS Agency:

[ ] Patient Care Report **[ ] Dispatch Information – CAD Card**

[ ] Incident Report(s) **[ ]- Event Narrative** **[ ] Investigator Report**

[ ] Base/Receiving Hospital Documentation (including audio recordings, if applicable)

Remedial Education/Training Required: **Yes* [ ]** **No [ ]**

***[ ] Attach Record of Remedial Education/Training**

[ ] Summation and Proposed Resolution

Comments:

Incident Narrative

Today's Date: _____

From: _____

Date of Incident: _____

Incident #: _____

Location of Incident: _____

Time of Incident: _____

Type of Incident: _____

Unit Assigned at Incident: _____

Scene Setting:

Patient(s) Condition:

Chronological Listing of Events:

Print Name: Signature

Quality Improvement Worksheet

System [ ] Provider Agency [ ] Individual [ ] Date:

Specific Trend Identified – Problem Statement
Data Reference(s):
Area of Required Improvement
Benchmark or Standard
Root Cause Analysis of Deviation

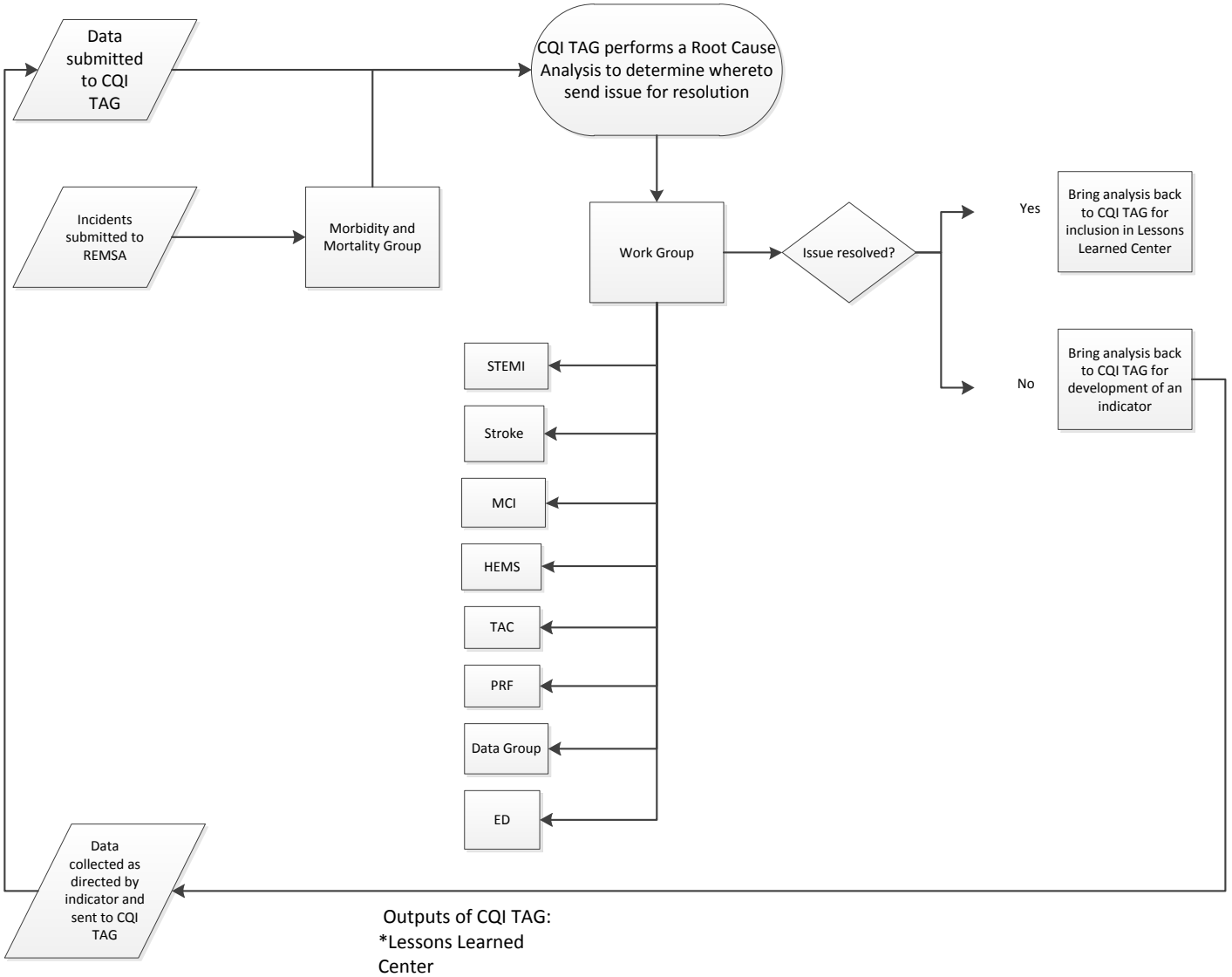
Action Plan for Alignment to Benchmark or Standard
Action Plan Owner(s): **Completion Date:**
Improvement Verification Activity (Solution Success or Failure)
Data Reference(s): **1st Check Date:** **2nd Check Date:**

Quality Improvement Worksheet Directions

Plan-Do-Check-Act: A Systematic Problem Solving Process will be utilized to address improvement plans. This matrix should be used in conjunction with the quality improvement worksheet.

PLAN **Step 1:** Identify the Problem	• Select the problem to be analyzed • Clearly define the problem and establish a precise problem statement • Set a measurable goal for the problem solving effort • Assemble and involve the necessary team members • Establish a process for coordinating improvement team actions
PLAN **Step 2:** Analyze the Problem for root cause of variation from the expected outcome	• Identify the processes that impact the problem (known as effectors) • List the steps in the process as it currently exists • Map the Process • Validate the map of the process • Collect and analyze data related to the problem • Identify root causes of the variation • Verify or revise the original problem statement • Collect additional data if needed to verify root causes
DO **Step 3:** Develop Solutions	• Establish criteria for selecting a solution based upon the target benchmark or standard • Generate potential solutions that will address the root causes of the problem • Select solutions and success validation metrics • Plan the solution in the form of an action plan • Implement the action plan
CHECK **Step 4:** Evaluate the results	• Gather data on the solution • Analyze the data on the solution
Achieved the Desired Goal?	• If **YES**, go to **Step 5.** • If **NO**, go back to **Step 1**
ACT **Step 5:** Standardize the Solution	• Identify systemic changes and training needs for sustained success • Adopt the solution as an operating practice • Plan ongoing monitoring of the solution = validation metrics • Continue to look for incremental improvements to refine the process

Appendix B – CQI TAG Information Flow



Outputs of CQI TAG:
*Lessons Learned Center
*Data Reports
*Action Plans (confidential)

Appendix B – Performance Standards Risk/Frequency Matrix

Riverside County Continuous Quality Improvement Program
Risk/Frequency Skill Matrix

Definitions:

High Risk Skills – Improper technique can cause harm to the patient.

Low Frequency – average less than 20 uses annually per EMT/paramedic

Category I Skills
Low Frequency/High Risk

- Adult Endotracheal Intubation
- Use of BLS Airway Adjuncts
- Positive Pressure Ventilation BVM
- Laryngoscopy with Foreign Body Removal
- Needle Thoracostomy
- Transcutaneous Pacing
- Synchronized Cardioversion
- Post Intubation ETT Confirmation and Monitoring
- Calculating and Preparing Drug Dosages
- Defibrillation
- Gum Elastic Bougie
- Rescue Airway
- Tourniquets
- Restraints
- Pediatric Patient Assessment
- Nerve Agency Antidote Kits (Mark I, Duo Dote)

Category II Skills
High Frequency/High Risk

- Scene Management
- Emergency Vehicle Operation
- Lifting, loading and moving of patients
- Control of External Hemorrhage
- ECG Interpretation
- Administration of IV Medications

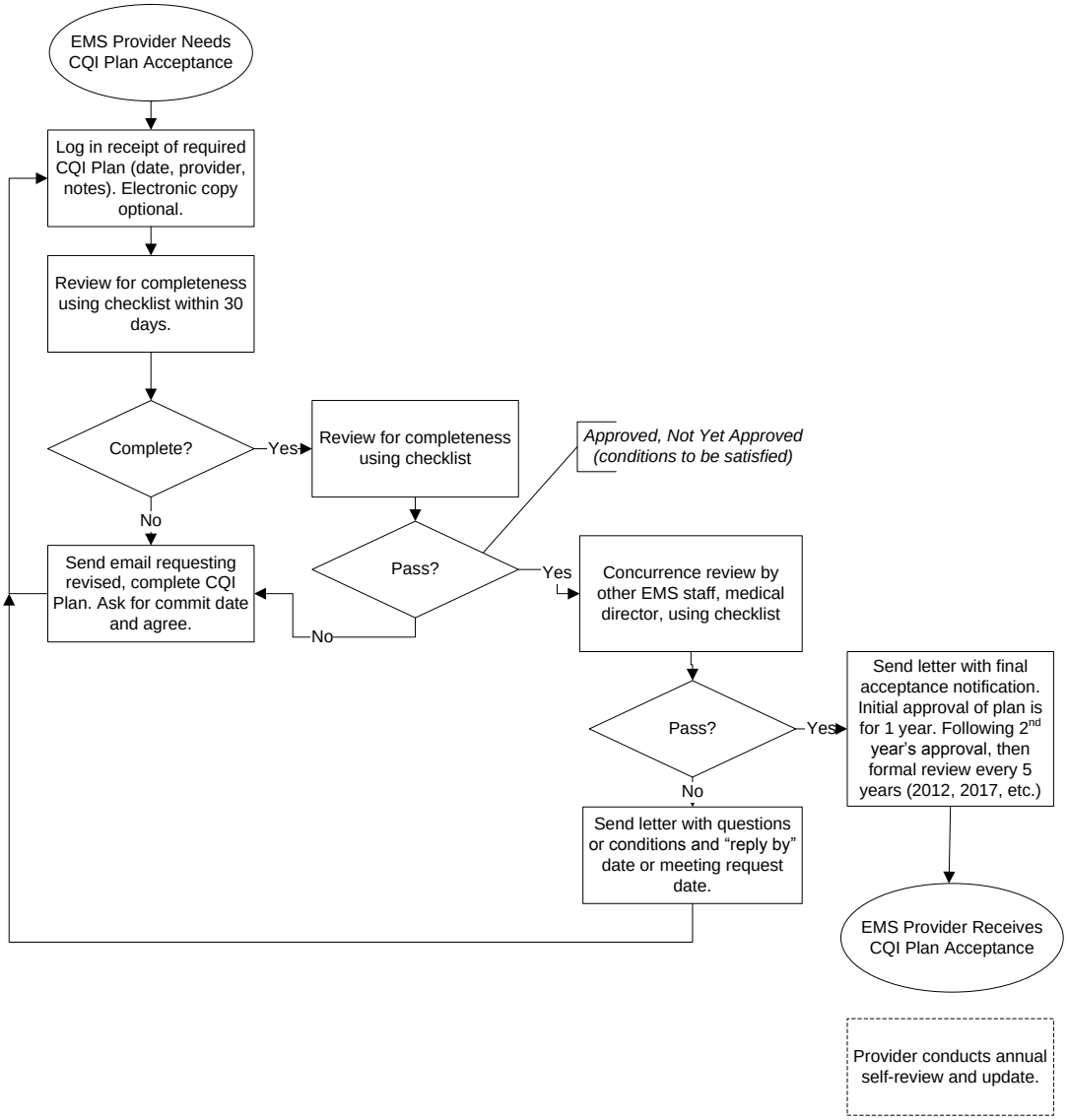
Category IV Skills
Low Frequency/Low Risk

- Administration of Intranasal Medications
- CPR
- Capnography on spontaneous breathing patients
- Intraosseous Therapy
- Childbirth

Category III Skills
High Frequency/Low Risk

- Patient Assessment
- Intravenous Therapy
- Patient Care Documentation
- Simple Splinting and Bandaging
- Venous blood Sampling
- Administration of IM Medications
- Administration of Aerosolized Medications
- Use of Pulse Oximeter
- Use of Glucometer
- Obtain Vital Signs
- Patient Positioning
- CPAP

Riverside County EMS CQI Plan Review Process



Rev. June 5, 2006

Appendix D – Core Measures

2010

Measure Set ID	Denominator Value (Count)	Numerator Value (Count)	Type of Reporting			Year to be Measured	
			% (90th Percentile)	Time (Minutes: Seconds	Numeric Value		
TRA_1						2013	**AMR was the only provider that was utilizing ePCR. They submitted data for 2010 only for RST_1, RST_2 and RST_3**
TRA_2						2013	
ACS_1						2013	
ACS_2						2013	
ACS_3						2013	
ACS_4						2014	
ACS_5						2013	
CAR_1						2014	
CAR_2						2013	
CAR_3						2013	
CAR_4						2013	
STR_1						2014	
STR_2						2013	
STR_3						2013	
STR_4						2014	
STR_5						2013	
RES_1						2014	
RES_2						2013	
PED_1						2013	
PED_2						2014	
PAI_1						2013	
PAI_2						2013	
SKL_1						2013	
SKL_2						2013	
RST_1	**Please report these values on the following worksheets**					2013	
RST_2						2013	
RST_3						2013	
PUB_1						2014	

RST_1

LEMSA	County	Zone Name	Denominator Value (Count)	Reporting Value
Riverside	Riverside	Pass Area	8368	0:11:57
Riverside	Riverside	Northwest	41124	0:11:31
Riverside	Riverside	Central	18837	0:11:24
Riverside	Riverside	San Jacinto/Hemet Valley	18384	0:09:36
Riverside	Riverside	Mountain Plateau	818	0:25:26
Riverside	Riverside	Southwest	25698	0:11:32
Riverside	Riverside	Cathedral City		
Riverside	Riverside	Idyllwild Fire Protection	**not on ePCR; no data submitted**	
Riverside	Riverside	Indio		
Riverside	Riverside	Cove Communities		
Riverside	Riverside	Desert	20187	0:13:28
Riverside	Riverside	Palo Verde Valley	**not on ePCR; no data submitted**	

RST_2

LEMSA	County	Zone Name	Denominator Value (Count)	Reporting Value
Riverside	Riverside	Pass Area	688	0:47:43
Riverside	Riverside	Northwest	4471	0:27:08
Riverside	Riverside	Central	1431	0:34:56
Riverside	Riverside	San Jacinto/Hemet Valley	2092	0:37:20
Riverside	Riverside	Mountain Plateau	11	1:41:26
Riverside	Riverside	Southwest	1240	0:45:17
Riverside	Riverside	Cathedral City	**not on ePCR; no data submitted**	
Riverside	Riverside	Idyllwild Fire Protection		
Riverside	Riverside	Indio		
Riverside	Riverside	Cove Communities		
Riverside	Riverside	Desert	1431	0:34:56
Riverside	Riverside	Palo Verde Valley	**not on ePCR; no data submitted**	

RST_3

LEMSA	County	Zone Name	Denominator Value (Count)	Reporting Value
Riverside	Riverside	Pass Area	5715/8386	68%
Riverside	Riverside	Northwest	31076/41124	76%
Riverside	Riverside	Central	14088/18837	75%
Riverside	Riverside	San Jacinto/ Hemet Valley	14174/18384	77%
Riverside	Riverside	Mountain Plateau	613/818	75%
Riverside	Riverside	Southwest	19014/25698	74%
Riverside	Riverside	Cathedral City	**not on ePCR; no data submitted**	
Riverside	Riverside	Idyllwild Fire Protection		
Riverside	Riverside	Indio		
Riverside	Riverside	Cove Communities		
Riverside	Riverside	Desert	13793/20187	68%
Riverside	Riverside	Palo Verde Valley	**not on ePCR; no data submitted**	

2011

Measure Set ID	Denominator Value (Count)	Numerator Value (Count)	Type of Reporting			Year to be Measured	
			% (90th Percentile)	Time (Minutes: Seconds	Numeric Value		
TRA_1						2013	
TRA_2						2013	
ACS_1						2013	
ACS_2						2013	
ACS_3						2013	
ACS_4						2014	**AMR was the only provider that was utilizing ePCR. They submitted data for 2010 only for RST_1, RST_2 and RST_3**
ACS_5						2013	
CAR_1						2014	
CAR_2						2013	
CAR_3						2013	
CAR_4						2013	
STR_1						2014	
STR_2						2013	
STR_3						2013	
STR_4						2014	
STR_5						2013	
RES_1						2014	
RES_2						2013	
PED_1						2013	
PED_2						2014	
PAI_1						2013	
PAI_2						2013	
SKL_1						2013	
SKL_2						2013	
RST_1	**Please report these values on the following worksheets**					2013	
RST_2						2013	
RST_3						2013	
PUB_1						2014	

RST_1

LEMSA	County	Zone Name	Denominator Value (Count)	Reporting Value
Riverside	Riverside	Pass Area	8712	0:11:24
Riverside	Riverside	Northwest	41617	0:11:24
Riverside	Riverside	Central	19644	0:11:11
Riverside	Riverside	San Jacinto/Hemet Valley	19404	0:09:45
Riverside	Riverside	Mountain Plateau	778	0:23:44
Riverside	Riverside	Southwest	26551	0:11:27
Riverside	Riverside	Cathedral City		
Riverside	Riverside	Idyllwild Fire Protection	**not on ePCR; no data submitted**	
Riverside	Riverside	Indio		
Riverside	Riverside	Cove Communities		
Riverside	Riverside	Desert	20750	0:12:56
Riverside	Riverside	Palo Verde Valley	**not on ePCR; no data submitted**	

RST_2

LEMSA	County	Zone Name	Denominator Value (Count)	Reporting Value
Riverside	Riverside	Pass Area	657	0:47:49
Riverside	Riverside	Northwest	3658	0:27:55
Riverside	Riverside	Central	1237	0:37:00
Riverside	Riverside	San Jacinto/Hemet Valley	1708	0:40:37
Riverside	Riverside	Mountain Plateau	13	1:04:50
Riverside	Riverside	Southwest	1158	0:45:40
Riverside	Riverside	Cathedral City		
Riverside	Riverside	Idyllwild Fire Protection	**not on ePCR; no data submitted**	
Riverside	Riverside	Indio		
Riverside	Riverside	Cove Communities		
Riverside	Riverside	Desert	2015	0:31:04
Riverside	Riverside	Palo Verde Valley	**not on ePCR; no data submitted**	

RST_3

LEMSA	County	Zone Name	Denominator Value (Count)	Reporting Value
Riverside	Riverside	Pass Area		
Riverside	Riverside	Northwest		
Riverside	Riverside	Central		
Riverside	Riverside	San Jacinto/Hemet Valley		
Riverside	Riverside	Mountain Plateau		
Riverside	Riverside	Southwest		
Riverside	Riverside	Cathedral City		
Riverside	Riverside	Idyllwild Fire Protection	**not on ePCR; no data submitted**	
Riverside	Riverside	Indio		
Riverside	Riverside	Cove Communities		
Riverside	Riverside	Desert		
Riverside	Riverside	Palo Verde Valley	**not on ePCR; no data submitted**	

2012

Measure Set ID	Denominator Value (Count)	Numerator Value (Count)	Type of Reporting			Year to be Measured	
			% (90th Percentile)	Time (Minutes: Seconds	Numeric Value		
TRA_1	463			0:3:00		2013	**AMR was the only provider that was utilizing ePCR. They submitted data for 2010 only for RST_1, RST_2 and RST_3**
TRA_2	463	306	66%			2013	
ACS_1	13738	6253	46%			2013	
ACS_2	13738	10460	76%			2013	
ACS_3	488			0:24:42		2013	
ACS_4						2014	
ACS_5	898	662	74%			2013	
CAR_1						2014	
CAR_2	452	104	23%			2013	
CAR_3	2300	138	46%			2013	
CAR_4	53	300	18%			2013	
STR_1						2014	
STR_2	3174	2276	72%			2013	
STR_3	2601			0:22:31		2013	
STR_4						2014	
STR_5	****Riverside County has not designated Stroke Centers. Unable to measure**					2013	
RES_1						2014	
RES_2	2989	2012	67%			2013	
PED_1	241	174	72%			2013	
PED_2						2014	
PAI_1	22631	22481	99%			2013	
PAI_2	1966	712	36%			2013	
SKL_1	1221	1039	85%			2013	
SKL_2	1041	976	94%			2013	
RST_1	****Please report these values on the following worksheets****					2013	
RST_2						2013	
RST_3						2013	
PUB_1	325	124	38%			2014	

RST_1

LEMSA	County	Zone Name	Denominator Value (Count)	Reporting Value
Riverside	Riverside	Pass Area	9450	0:11:43
Riverside	Riverside	Northwest	44299	0:11:39
Riverside	Riverside	Central	28093	0:11:20
Riverside	Riverside	San Jacinto/Hemet Valley	20220	0:09:32
Riverside	Riverside	Mountain Plateau	932	0:25:57
Riverside	Riverside	Southwest	29040	0:11:10
Riverside	Riverside	Cathedral City	****not on ePCR; no data submitted****	
Riverside	Riverside	Idyllwild Fire Protection		
Riverside	Riverside	Indio	2455	0:07:00
Riverside	Riverside	Cove Communities	3005	0:08:00
Riverside	Riverside	Desert	21788	0:12:54
Riverside	Riverside	Palo Verde Valley	****not on ePCR; no data submitted****	

RST_2

LEMSA	County	Zone Name	Denominator Value (Count)	Reporting Value
Riverside	Riverside	Pass Area	753	0:43:30
Riverside	Riverside	Northwest	3963	0:29:28
Riverside	Riverside	Central	1583	0:36:45
Riverside	Riverside	San Jacinto/Hemet Valley	1762	16:41:20
Riverside	Riverside	Mountain Plateau	8	1:37:02
Riverside	Riverside	Southwest	1060	0:48:21
Riverside	Riverside	Cathedral City	**not on ePCR; no data submitted**	
Riverside	Riverside	Idyllwild Fire Protection		
Riverside	Riverside	Indio	1382	0:07:59
Riverside	Riverside	Cove Communities	1919	0:07:24
Riverside	Riverside	Desert	2230	0:29:57
Riverside	Riverside	Palo Verde Valley	**not on ePCR; no data submitted**	

RST_3

LEMSA	County	Zone Name	Denominator Value (Count)	Reporting Value
Riverside	Riverside	Pass Area	6432/9450	68%
Riverside	Riverside	Northwest	34324/44299	78%
Riverside	Riverside	Central	15857/28093	56%
Riverside	Riverside	San Jacinto/Hemet Valley	15807/20220	78%
Riverside	Riverside	Mountain Plateau	724/932	78%
Riverside	Riverside	Southwest	21243/29040	73%
Riverside	Riverside	Cathedral City	**not on ePCR; no data submitted**	
Riverside	Riverside	Idyllwild Fire Protection		
Riverside	Riverside	Indio	3330/3843	87%
Riverside	Riverside	Cove Communities	4276/4925	87%
Riverside	Riverside	Desert	15126/21788	69%
Riverside	Riverside	Palo Verde Valley	**not on ePCR; no data submitted**	