EL Dorado County Fire Protection District

2025

Continuous Quality Improvement Plan

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CONTENTS

Message From the Fire Chief 2
Introduction 3
Legal & Regulatory Framework 3
About the DISTRICT 4
Purpose & Goals 5
Just Culture Integration 5
Investigation Process Using Just Culture 6
CQI Team Structure & Responsibilities 9
Performance Metrics & Key Performance Indicators (KPIs) 10
1. RESPONSE & OPERATIONAL EFFICIENCY METRICS 10
1.1. Response Time 10
1.2. Turnout Time 10
1.3. On-Scene Time 11
1.5. Transfer Time to Transporting EMS 11
2. PATIENT CARE & CLINICAL OUTCOMES 11
2.1. Return of Spontaneous Circulation (ROSC) Rate (Prehospital) 11
2.2. Cardiac Arrest First Shock Time 12
2.3. Airway Management Success Rate 12
2.4. Pain Management Compliance 12
2.5. STEMI & Stroke Recognition Accuracy 13
2.6 Seamless Handoff to Transporting EMS 13
2.7. Non-Transport Decision Rate 13
3. SAFETY & COMPLIANCE. 14
3.1. Medication Error Rate 14
3.2. Scene Safety Incidents 14
3.3. PPE Compliance Rate 14
Data Collection & Analysis Process 15
Evaluation, Reporting & Compliance 15
Conclusion 16

MESSAGE FROM THE FIRE CHIEF

Our Emergency Medical Services (EMS) professionals are the backbone of our community's public safety and healthcare system. Every day, they answer the call—providing life-saving care, compassion, and unwavering dedication to those in need.

The role of EMS goes beyond emergency response; it's about ensuring that no matter where you are in El Dorado County, help is just moments away. Our paramedics and EMTs work tirelessly, often under difficult and unpredictable conditions, to safeguard the health and well-being of our residents and visitors.

As part of our ongoing commitment to excellence, we have submitted our Continuous Quality Improvement (CQI) plan to enhance patient care, training, and operational efficiency. This plan ensures that we continually evaluate and improve our EMS services, reinforcing our dedication to providing the highest standard of emergency medical care.

I want to extend my deepest gratitude to our EMS personnel for their commitment, skill, and resilience. Their dedication saves lives and brings comfort to families in their most critical moments.

As Fire Chief, I stand in full support of EMS and the essential services they provide. Together, we will continue to strengthen our emergency response system, ensuring the highest level of care for everyone in El Dorado County.

Stay safe,
Tim Cordero

El Dorado County Fire Chief

INTRODUCTION

The El Dorado County Fire Protection District (ECF) is committed to delivering high-quality emergency response services while fostering a culture of continuous improvement, accountability, and professional excellence. This Continuous Quality Improvement (CQI) Plan is designed to enhance EMS, and overall operational effectiveness through a structured, data-driven approach. By integrating Just Culture principles, ECF encourages open reporting of errors and near misses, ensuring that learning and safety remain at the forefront of service delivery.

The CQI plan complies with the California Code of Regulations, Title 22, and California Health and Safety Code, Division 2.5 (Section 1797 et seq.), which establish legal mandates for EMS quality improvement and performance evaluation. Through ongoing monitoring, assessment, and improvement initiatives, ECF aims to enhance training programs, protocol adherence, equipment usage, and patient outcomes. This plan also prioritizes collaboration among fire and EMS personnel, leadership, regulatory agencies, and the community, ensuring that emergency response services remain effective, efficient, and aligned with state and local standards.

LEGAL & REGULATORY FRAMEWORK

The California Code of Regulations, Title 22, provides the statutory requirements for EMS training, certification, and operational standards. These regulations define the scope of practice for EMTs, paramedics, and prehospital care providers, ensuring that all medical interventions adhere to state-approved protocols. Title 22 also mandates that EMS providers implement a quality improvement process, focusing on patient care, response efficiency, and provider competency.

Additionally, the California Health and Safety Code, Division 2.5, Section 1797, governs EMS oversight, quality assurance, and compliance at the local, regional, and state levels. Under Section 1797.102, EMS providers must establish a CQI program that actively monitors response times, patient care outcomes, and adherence to protocols. Section 1797.204 assigns Local EMS Agencies (LEMSAs) the responsibility of overseeing CQI initiatives and ensuring compliance with statewide EMS standards. Section 1797.220 grants medical directors the authority to implement policies and procedures that enhance prehospital patient care. Furthermore, Section 1798.200 outlines the disciplinary process for EMS providers, ensuring accountability while protecting public safety. By adhering to these legal requirements, ECF strengthens its commitment to quality, transparency, and regulatory compliance

ABOUT THE DISTRICT

ECF is an emergency response agency dedicated to protecting lives, property, and natural resources across 281 square miles of El Dorado County, California. The district provides fire suppression, EMS, technical rescue operations, and fire prevention programs. Serving over 74,000 residents, ECF plays a critical role in safeguarding both rural and urban communities.

With a mission to deliver professional, efficient, and effective emergency services, ECF operates 5 fire stations strategically positioned to ensure rapid response across its service area. Its vision is to lead in fire protection, emergency medical care, all while fostering resilience within the community. The district employs a combination of 81 career firefighters, paramedics and administrative staff all committed to maintaining high standards of public safety.

ECF provides a wide range of services from Fire Suppression, Fire Prevention, Public Education, Advanced Life Support (ALS) and Basic Life Support (BLS) emergency medical services, ensuring that residents receive prompt and high-quality pre-hospital care. The agency also specializes in technical rescue operations, including vehicle extrications, rope rescues, and swift-water rescues.

The district operates through a combination of special district funding, state and federal grants, and local support. To enhance its capabilities, ECF collaborates with Cal Fire, the U.S. Forest Service, or Local Government Fire agencies, Cal OES, FEMA, and local law enforcement agencies to secure resources to support emergency preparedness and response. Through mutual aid agreements with neighboring fire departments, the district ensures operational area response capabilities during large-scale emergencies.

ECF remains steadfast in its commitment to protecting lives, property, and the environment through efficient emergency response, fire prevention, EMS, and preparedness. By continuously evolving and adapting to new challenges, ECF ensures a safer and more resilient future for the communities it serves.

PURPOSE & GOALS

The primary goal of the CQI plan is to create a systematic framework for evaluating and improving EMS performance as it directly relates to ECF. This includes:

- Enhancing patient care through evidence-based training and education.
- Identifying operational inefficiencies and implementing process improvements to reduce errors and optimize response effectiveness.
- Encouraging a Just Culture, where firefighters and EMS personnel feel safe reporting mistakes for the purpose of learning rather than punishment.
- Utilizing data analytics and performance metrics to track trends in incident response times, patient outcomes, and personnel competency.
- Ensuring compliance with Title 22 and Health & Safety Code 1797, thereby maintaining high standards of service.
- Providing continuous training and professional development opportunities for fire and EMS personnel, improving readiness and adaptability in emergency situations.

By fostering an environment of continuous learning and accountability, ECF enhances its ability to provide timely, effective, and life-saving emergency response services.

JUST CULTURE INTEGRATION

A Just Culture promotes organizational learning, safety, and fairness by distinguishing between different types of behaviors that contribute to errors or system failures. This model encourages personnel to report mistakes without fear of disciplinary action when errors are unintentional, allowing the department to analyze incidents and implement corrective measures.

Just Culture categorizes behaviors into three main types:

1. Human Error – These are unintentional mistakes, such as incorrect medication dosages or miscommunication during a rescue operation. Response: Training, process improvement, and coaching rather than punishment.

2. At-Risk Behavior – This involves taking shortcuts or unnecessary risks, such as skipping an equipment check due to time constraints. Response: Educational reinforcement and review of standard operating procedures (SOPs).

3. Reckless Behavior – This includes intentional disregard for protocols, such as falsifying a patient report or failing to follow safety procedures. Response: Corrective action or disciplinary measures per Title 22 and Health & Safety Code 1797.200.

By integrating Just Culture principles, ECF promotes transparency, trust, and accountability while focusing on learning, coaching, and systemic improvements rather than punishment for honest mistakes.

INVESTIGATION PROCESS USING JUST CULTURE

The Just Culture approach in EMS incident investigations ensure a balanced, fair, and constructive process that promotes accountability while fostering a culture of learning and continuous improvement. Rather than focusing on blame, this process evaluates whether errors resulted from human mistakes, system flaws, or reckless actions, ensuring appropriate responses that improve safety and prevent recurrence.

The process begins with incident identification and reporting, which encourages EMS personnel to report safety concerns, near misses, or adverse events without fear of unjust punishment. Reporting can be done through anonymous safety reporting systems, direct supervisor notifications. The goal is to create an environment where providers feel safe reporting incidents, fostering transparency and open communication. Once an incident is reported, an initial classification is conducted to determine the severity of the event and whether immediate corrective actions are necessary to ensure ongoing patient and provider safety.

Following initial reporting, the fact-gathering phase involves securing all relevant details about the event, including patient care reports (PCRs), dispatch recordings, equipment logs, and witness statements. Supervisors or designated positions conduct structured interviews with EMS

providers and other relevant personnel involved in the incident. Special care is taken to ensure these interviews are conducted in a non-punitive, learning-focused manner. Data such as environmental conditions, time of day, provider workload, and resource availability are also reviewed to gain a comprehensive understanding of contributing factors.

Once the facts are gathered, the incident is assessed using a Just Culture framework to determine the nature of the behavior that led to the event. Errors are categorized into three main types: human error, at-risk behavior, and reckless behavior.

Human error refers to inadvertent mistakes, such as miscalculating a medication dose due to fatigue or distraction. In such cases, the focus shifts to coaching, system redesign, and additional training rather than disciplinary measures.

At-risk behavior involves a deviation from best practices due to risk perception issues, such as skipping a secondary assessment in an effort to expedite transport. This type of behavior warrants constructive feedback, policy reinforcement, and education on the risks involved. Reckless behavior, on the other hand, is characterized by a conscious disregard for safety protocols, such as an EMS provider operating an ambulance under the influence of alcohol. This type of conduct requires appropriate accountability measures, which may include disciplinary action, suspension, or termination, depending on the severity of the violation. The objective is to differentiate system-based issues from individual responsibility while maintaining fairness.

To further understand the root causes of an incident, a Root Cause Analysis (RCA) is conducted. This involves examining organizational, procedural, and human factors that may have contributed to the event. The analysis considers multiple elements, such as communication breakdowns, unclear protocols, equipment malfunctions, provider fatigue, and environmental challenges. A full analysis is often needed to identify how multiple small failures within a system

can align to create a significant event. Through this process, leadership gains a deeper understanding of whether the incident resulted from a systemic flaw that requires procedural improvements or an individual action that warrants accountability interventions.

Once the root cause is identified, the incident undergoes a collaborative review that is composed of EMS leadership, medical directors, and frontline EMS providers. This group evaluates the findings and determines appropriate corrective actions, prioritizing system improvements and education over punitive measures unless recklessness is identified. The emphasis is on learning from mistakes and strengthening policies, training programs, and operational procedures to reduce the likelihood of similar events occurring in the future.

Following the review, corrective actions and system improvements are implemented. Depending on the findings, interventions may include training programs to address skill deficiencies, updates to EMS protocols, and modifications in dispatch procedures. In cases where at-risk behaviors are identified, coaching sessions and peer mentoring are encouraged to guide providers toward safer decision-making. When system flaws are identified as contributing factors, leadership may implement process redesigns, such as enhancing communication protocols, refining documentation procedures, or improving equipment availability. Additionally, support resources, such as counseling and peer support teams, may be provided to personnel involved in emotionally distressing incidents.

Finally, the follow-up phase ensures that corrective actions are effective and that lessons learned are incorporated into EMS training programs and safety initiatives. Regular case reviews, debriefing sessions, and simulation-based learning allow providers to reflect on real-world scenarios and integrate safety principles into their daily practice. Trend analysis and data tracking help identify recurring safety concerns, prompting proactive interventions before similar incidents arise. By reinforcing a learning culture, EMS agencies can improve patient care, reduce provider burnout, and enhance overall operational efficiency.

Just Culture-based EMS investigation process ensures a fair, systematic, and transparent approach to reviewing incidents, focusing on accountability, learning, and safety improvements

rather than blame. By distinguishing between human error, at-risk behavior, and reckless actions, EMS agencies can enhance patient safety, strengthen provider performance, and cultivate a culture where continuous improvement and professional growth are prioritized. This approach not only reduces fear-based reporting barriers but also builds trust among EMS providers, ultimately leading to a safer and more effective emergency medical system.

CQI TEAM STRUCTURE & RESPONSIBILITIES

The CQI program is managed by a multidisciplinary team that oversees performance reviews, training initiatives, and process improvements. The team consists of:

- Fire Chief, Tim Cordero– Provides overall leadership and strategic oversight.
- EMS Chief, Steve Adams – Provides direct oversight of the EMS Division, setting goals and priorities.
- CQI Coordinator, Brad Gates – Manages quality improvement processes, data analysis, and system evaluations. Identifies trends in response times, patient care, and operational efficiency.
- Training Chief, Paul McVay– Oversees fire and EMS training programs, including certification updates and professional development.
- Division Chiefs , Staff– Serve as field mentors, providing operational insights and monitoring firefighter/EMS performance.
- Field Firefighters & EMS Personnel, Staff – Actively participate in incident improvement activities , case reviews, and feedback reporting.

The CQI Committee meets quarterly to review performance data, training requirements, and incident reports, ensuring systematic oversight and continuous improvement.

PERFORMANCE METRICS & KEY PERFORMANCE INDICATORS (KPIS)

As ECF is a non-transporting ALS Fire organization, performance metrics and KPIs are focused on response efficiency, patient care quality, and seamless integration with transport resources. Since ECF provides advanced life support but does not transport patients, their success is measured by rapid response, effective patient stabilization, and coordination with transporting resources. The following are the core capabilities and performance metrics ECF will focus on in the 2025/2026 year's incidences.

1. RESPONSE & OPERATIONAL EFFICIENCY METRICS

1.1. RESPONSE TIME

- Definition: Time from call dispatch to arrival at the scene.
- Purpose: Measures of how quickly ALS resources arrive to initiate care.
- Benchmark:
  - Urban areas: ≤6 minutes (90% of calls).
  - Suburban areas: ≤8 minutes.
  - Rural areas: ≤12 minutes.
- Improvement Strategies:
  - Deploy units based on high-call volume areas.

1.2. TURNOUT TIME

- Definition: Time from dispatch notification to unit en route.
- Purpose: Assesses crew readiness.
- Benchmark: <1 minute for medical day calls (08:00-2100) and < 2 minutes night calls (2100 – 0800).
- Improvement Strategies:
  - Improve station alerting systems.
  - Optimize crew readiness procedures.

1.3. ON-SCENE TIME

- Definition: Time spent on the scene providing care before handing off to a transporting unit.
- Purpose: Measures of efficiency of care delivery.
- Benchmark:
  - Trauma: ≤10 minutes ("Golden Hour" principle).
  - Medical: ≤15 minutes.
- Improvement Strategies:
  - Standardized ALS protocols for rapid interventions.
  - Train and standardized crew roles and responsibilities.
  - Coordination with transport EMS to minimize delay.

1.5. TRANSFER TIME TO TRANSPORTING EMS

- Definition: Time from ALS arrival to patient handoff to a transporting ambulance.
- Purpose: Ensures seamless care continuity.
- Benchmark: <10 minutes.
- Improvement Strategies:
  - Improve the system status of transporting units.
  - Implement standardized handoff protocols.

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2. PATIENT CARE & CLINICAL OUTCOMES

2.1. RETURN OF SPONTANEOUS CIRCULATION (ROSC) RATE (PREHOSPITAL)

- Definition: Percentage of cardiac arrest patients who achieve ROSC before hospital arrival.
- Purpose: Measures effectiveness of ALS interventions in cardiac arrest cases.
- Benchmark: 30-40%.

- Improvement Strategies:
    - High-performance CPR training.
    - Early defibrillation.

2.2. CARDIAC ARREST FIRST SHOCK TIME

- Definition: Time from ALS arrival to first defibrillation in patients with shockable rhythms.
- Purpose: Ensures rapid intervention in sudden cardiac arrest.
- Benchmark: ≤2 minutes after arrival.
- Improvement Strategies:
    - Implement crew training for rapid rhythm recognition.

2.3. AIRWAY MANAGEMENT SUCCESS RATE

- Definition: Percentage of successful advanced airway placements (ET intubation or supraglottic airways).
- Purpose: Measures proficiency in securing patient airways.
- Benchmark: 85-95% first-pass success rate.
- Improvement Strategies:
    - Use video laryngoscopy.
    - Implement regular airway skills training.

2.4. PAIN MANAGEMENT COMPLIANCE

- Definition: Percentage of eligible patients receiving appropriate pain management (e.g., fentanyl, ketamine, Versed) per protocol.
- Purpose: Ensures adequate pain relief for trauma and medical patients.
- Benchmark: ≥90% compliance.
- Improvement Strategies:
    - Improve assessment tools (e.g., numeric pain scale).

- Rapid assessment to identify makers of pain (e.g., V.S., paint appearance. Mechanism of Injury)

2.5. STEMI & STROKE RECOGNITION ACCURACY

- Definition: Percentage of suspected STEMI and stroke patients correctly identified and pre-alerted to receiving hospitals.
- Purpose: Ensures rapid hospital intervention.
- Benchmark: ≥90% accurate identification with base hospital notification.
- Improvement Strategies:
    - Regular 12-lead ECG interpretation training.
    - Use validated stroke assessment tools (e.g., Cincinnati Stroke Scale).

2.6 SEAMLESS HANDOFF TO TRANSPORTING EMS

- Definition: Qualitative measure of how smoothly patients are transferred to transport units.
- Purpose: Ensures continuity of care.
- Benchmark: <5% cases with documented delays or issues.
- Improvement Strategies:
    - Use structured SBAR (Situation, Background, Assessment, Recommendation) handoff format.

2.7. NON-TRANSPORT DECISION RATE

- Definition: Percentage of ALS activations where no transport is required.
- Purpose: Evaluates how often ALS units manage patients without transport.
- Benchmark: Varies by department (target ~10-20%).
- Improvement Strategies:
    - Implement treat-and-release protocols with medical control oversight.

3. SAFETY & COMPLIANCE.

3.1. MEDICATION ERROR RATE

- Definition: Number of reported medication errors per 1,000 ALS calls.
- Purpose: Identifies safety risks in drug administration.
- Benchmark: <0.5% of cases.
- Improvement Strategies:
    - Double-check system for high-risk medications.

3.2. SCENE SAFETY INCIDENTS

- Definition: Number of incidents where providers encountered violent or hazardous conditions.
- Purpose: Measures provider safety.
- Benchmark: Varies by jurisdiction.
- Improvement Strategies:
    - Implement improved dispatch screening for scene safety concerns.

3.3. PPE Compliance Rate

- Definition: Percentage of calls where appropriate personal protective equipment (PPE) was used.
- Purpose: Ensures provider safety.
- Benchmark: ≥95%.
- Improvement Strategies:
    - Reinforce infection control training.

For non-transporting ALS fire departments, rapid response, effective patient stabilization, and smooth handoffs are the primary performance drivers. By tracking these KPIs, fire-based EMS can ensure they provide high-quality ALS care while effectively integrating with transport resources.

DATA COLLECTION & ANALYSIS PROCESS

Incident data is collected through the Image Trend Elite electronic reporting system, enabling real-time tracking and monitoring of emergency response activities. This advanced platform captures key details, including response times, personnel involved, incident severity, and interventions performed. The system categorizes cases based on priority, ensuring that high-risk incidents receive immediate attention and follow-up.

Within Image Trend Elite, high-priority cases undergo in-depth analysis, where district staff evaluate response efficiency, protocol adherence, and system inefficiencies. The platform's analytics tools generate detailed reports, including time-stamped events, compliance tracking, and automated alerts for deviations from standard operating procedures (SOPs).

A key feature of Image Trend Elite is its ability to visualize trends through interactive dashboards, heat maps, and response time analytics. These tools highlight recurring issues, pinpoint training gaps, and provide leadership with actionable insights to enhance operational effectiveness. Reports can include:

- Incident frequency charts to track common emergency types.
- Protocol compliance trends to assess adherence to medical and safety guidelines.
- Training effective metrics to evaluate the impact of educational initiatives.

Findings from this data-driven approach directly influence policy updates, SOP revisions, and training enhancements. By leveraging Image Trend Elite's real-time data and predictive analytics, emergency response teams can proactively mitigate risks, improve decision-making, and prevent recurring issues, ultimately enhancing overall service delivery and patient outcomes.

EVALUATION, REPORTING & COMPLIANCE

CQI findings are systematically documented in comprehensive quarterly and annual reports, which provide an in-depth analysis of performance trends, training outcomes, and targeted improvement strategies. These reports highlight key metrics, such as response times, patient care

quality, and adherence to clinical guidelines, offering a data-driven evaluation of system efficiency and effectiveness.

Once compiled, the reports are submitted to the LEMSA, relevant regulatory agencies, and local government authorities for thorough review and oversight. This process ensures that all stakeholders remain informed about operational performance and areas needing enhancement.

To uphold compliance with Title 22 regulations and Health & Safety Code 1797 mandates, regular audits and evaluations are conducted. These audits assess protocol adherence, identify deficiencies, and recommend corrective actions. By maintaining rigorous accountability and transparency, the CQI program fosters continuous enhancements in emergency medical services, ultimately improving patient outcomes and system reliability.

CONCLUSION

This ongoing dedication to excellence reinforces ECF's mission to protect and serve with integrity, accountability, and innovation. By embracing continuous quality improvement, the department remains prepared to adapt, grow, and enhance emergency services for the benefit of the community it serves. Through ongoing training, performance evaluations, and the adoption of industry's best practices, ECF ensures its personnel are equipped with the skills, knowledge, and resources needed to provide exceptional emergency response. This commitment not only strengthens public trust but also fosters a culture of resilience, collaboration, and proactive problem-solving, ensuring that the department remains a leader in emergency services for years to come.