

Grand County Colorado



Emergency Medical & Trauma Services System
Consultation

January 16 -19, 2018



COLORADO

Health Facilities & Emergency
Medical Services Division

Department of Public Health & Environment



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Health & Environment

Dedicated to protecting and improving the health and environment of the people of Colorado

July 18, 2018

Grand County
Board of County Commissioners
308 Byers Avenue
Hot Sulphur Springs, CO 80451

Dear Commissioners,

On behalf of the Colorado Department of Public Health and Environment, we are attaching the Grand County emergency medical and trauma services system consultative review report. Pursuant to your invitation and support of this project, a group of consultants worked under the general coordination of the department to review the current status of the emergency medical and trauma services system in Grand County. The Grand County Board of County Commissioners and the local emergency medical and trauma services community are to be commended for the dedication and foresight you demonstrated by undertaking this important activity. We hope this report will provide the basis from which the community can move forward to ensure that quality patient care and transportation continue to be provided throughout the county.

The department is pleased to have provided the funding for this project and wishes to thank Grand County for its willingness to provide additional resources and support to this effort. Understanding that Colorado statute vests each county with the authority to develop, design and implement local emergency medical services systems, this consultative review is intended to provide insight and information from which the Board of County Commissioners, and local emergency medical and trauma services providers can make the policy decisions necessary to support the development of improved services to patients throughout your jurisdiction. The report itself has been authored by members of the contracted review team and represents their perspectives and recommendations. Understanding that the department has limited regulatory authority regarding services that provide prehospital care and transportation, this report nonetheless represents our commitment to work with local governments to ensure quality health care for all Coloradans.

As Grand County considers its next steps, if our office can be of further assistance, please reach out and we will look forward to the opportunity to assist any way we can.

Respectfully,

D. Randy Kuykendall, MLS
Director, Health Facilities and EMS Division
Colorado Department of Public Health and Environment

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Introduction and Project Overview

Grand County requested a consultative visit from the department to ensure high-quality emergency services continue to be provided to its citizens and visitors. The Emergency Medical and Trauma Services Branch of the Health Facilities and Emergency Medical Services Division, pursuant its authority to assist local jurisdictions provided in C.R.S. § 25-3.5-102 and 603 respectively, recruited a consultative visit team to evaluate the emergency medical and trauma services system in Grand County and make recommendations for system improvement. The county provided invaluable assistance to coordinate with local emergency medical and trauma services stakeholders and the department in this consultation process.

Under Colorado law, the Board of County Commissioners is the ground ambulance licensing authority as defined by C.R.S. § 25-3.5-301. Grand County EMS is the only ground ambulance service licensed in Grand County, and provides 911 emergency response and critical care interfacility transports. Fire and rescue services are provided by five volunteer departments located throughout the county. Backcountry rescue services are provided by Grand County Search and Rescue, and Rocky Mountain National Park. Ski patrols at Winter Park-Mary Jane and Ski Granby Ranch provide medical care and evacuate patients from the slopes. There are three medical facilities in Grand County. Denver Health East Grand Medical Center, Middle Park Medical Center-Granby and Middle Park Medical Center-Kremmling. Both Middle Park facilities currently hold Level IV trauma center designation and East Grand Medical Center is currently designated as a Level V trauma center. Dispatch and public safety communication services are provided by the Grand County Sheriff's Office Communication Center. There are no air medical providers based in Grand County but three services are based nearby in adjacent counties. Mutual aid resources are also available from neighboring counties when requested. The next closest critical care ground transport resources are based in Summit County.



Analysis of the current system involved a survey, interviews with primary stakeholders and a review of available system data. The state of the current system was analyzed using elements derived from the 14 EMS system components identified in the 1996 EMS Agenda for the Future, published by the National Highway Traffic Safety Administration, with the addition of a Colorado-specific component. These attributes serve as the basis for a number of statewide and regional planning activities and are further referenced in 6 CCR 1015-4, Chapter Four. A list of short-, medium- and long-term recommendations with guidance for implementation is provided in this report for consideration to improve the overall Grand County emergency medical and trauma services system, including the treatment, transportation, communication and documentation subsystems addressed in C.R.S. § 25-3.5-101 et seq.

The survey showed that stakeholders rated the overall effectiveness of the Grand County emergency medical and trauma services system as above average. During the on-site visit, the members of the various emergency medical and trauma services organizations demonstrated their commitment to provide outstanding service for this rural community and it was evident that the community recognizes this dedication with its support of the medical facilities and emergency response agencies serving the area.

Grand County Geography and Demographics

Grand County is located in north-central Colorado and is neighbored by eight other counties including Boulder, Clear Creek, Eagle, Gilpin, Jackson, Larimer, Routt and Summit. Grand County is large, encompassing 1,870 square miles, with an average elevation of 9,204 feet. The estimated 2017 population provided by the U.S. Census Bureau is 15,321 residents and a population density of 8 people per square mile. According to 2017 estimates, the population of Grand County had increased 3.2 percent from 2010 while county populations in Colorado increased an average of 11.5 percent during this period. The over-65 age group in Grand County is 15.3 percent compared to an over-65 population of 13.4 percent for the state. The median household income within Grand County is \$67,623, compared to \$62,520 for the state, with an estimated percentage in poverty of 8.2 percent. The median home price is estimated at \$297,500 compared to a state median price of \$264,600. The county mirrors the state in the area of health insurance, with an estimated 9.6 percent uninsured compared to 9.2 percent for the state. The assessed valuation for Grand County in 2017 was \$659,816,070 compared to the average assessed valuation of \$1,744,216,735 for the 64 counties in Colorado. The Grand County mill levy is 16.610 on assessed valuation and has a 1.3 percent sales tax. Eligible transactions are also subject to sales taxes imposed by state and municipal governments.

Grand County was created in 1874, two years before Colorado became a state, when it was carved from Summit County by the territorial government. The western portion of the county was ceded in 1877 by the establishment of Routt County and the current northern border was set in 1886 when the Colorado Supreme Court resolved a boundary dispute with Larimer County. The county was named after the Grand River, as the Colorado River was called at the time. The landscape of Grand County is characterized by rugged mountains and large valleys. The area was first occupied by the Ute people who relied on the rich hunting grounds in the area. Tourism has played a key role in Grand County since the 1860s when William Byers, founder of the Rocky Mountain News, established a resort at Hot Sulphur Springs. Skiing became a bigger draw after World War II and eventually large resorts developed to provide a myriad of winter sports, and now year-round, activities. Mining had a smaller impact in Grand County than for its neighbors. Gold was extracted for a short period during the rush in the late 1850s and molybdenum ore has been processed at a mill southeast of Kremmling since the late 1970s. In spite of the harsh winters, agriculture has been a component of the local economy since the first settlers came to the area. Cattle ranches and productive hay meadows are spread across the county along the valley floor and timber has been harvested from nearby slopes. Improved transportation opened Grand County to further development. Stage roads and rail lines were carved through the mountains to connect the small towns to larger population centers. At first, the railroad crossed the Continental Divide east of Winter Park and eventually made its way to Steamboat Springs. The Moffat Tunnel was built to bring rail traffic to the western slope by travelling through the mountains rather than over them. The tunnel also included a pipeline that allowed water to be diverted from western basins to support the growing cities and irrigation needs east of the mountains. The stage roads eventually became highways as automobiles became more prevalent. US Highway 40, the busiest transportation corridor, runs through Grand County from Berthoud Pass in the southeast to Rabbit Ears Pass in the northwest. US Highway 34 enters the county on Trail Ridge

Road in the northeast and connects to Highway 40 near Granby. Trail Ridge Road, the gateway to Rocky Mountain National Park, is the highest continuous highway in the United States and is subject to seasonal closure due to snow during much of the year. State Highway 125 intersects Highway 40 west of Granby and runs north over Willow Creek Pass towards Walden. State Highway 9 enters Grand County near Green Mountain Reservoir and connects with Highway 40 in Kremmling. Highway 9 is the only major road that does not traverse a mountain pass to enter Grand County. State Highway 134 intersects Highway 40 north of Kremmling and heads west, ascending Gore Pass before dropping into the southern portion of Routt County.

Emergency Medical and Trauma Service Providers

Grand County EMS

Grand County EMS was established in 1970 and initially operated under the Sheriff's Office



with volunteer EMTs using two Cadillac ambulances based at the courthouse in Hot Sulphur Springs. Today, Grand County EMS offers paramedic and critical care advanced life support services with full-time paid staff using eight type I

ambulances based at stations in Fraser, Granby, Grand Lake and Kremmling. The highly-trained staff is supported by a sophisticated internal continuing education program to help maintain required competencies. The education program also provides community education and has partnered with numerous other organizations throughout the county to deploy more than 50 public access automated external defibrillators. Grand County EMS also offers initial EMT training for students at Middle Park High School and West Grand High School through an affiliation with a recognized training center on the Front Range. These courses prepare high school seniors with the knowledge and skills for a career in health care or public safety. A number of students who have completed this high school EMT class are now serving Grand County through their work with the ambulance or fire services. The service is funded by user fees, donations, grants and a dedicated 2 mill property tax subsidy from Grand County. Grand County EMS reported 2,166 responses in 2017. Scene responses account for about 60 percent of the total volume, interfacility transports comprise about 30 percent and the remainder are mostly standbys. Emergency patients are typically transported to the closest medical facility in Granby, Kremmling or Winter Park. Most interfacility transports are to tertiary care centers in the Denver metropolitan area.

In 2004, Dr. John Nichols spearheaded the development of the Mountain Medical Response Team (MMRT) concept to enhance backcountry response capabilities. The MMRT is designed to perform the medical component of a backcountry rescue while search and rescue teams complete the technical aspects. Grand County EMS personnel volunteer for assignment of extra duty responsibilities with MMRT and receive additional training including avalanche awareness, land navigation, firearms awareness, off-highway vehicle operations, wildland firefighting, tactical EMS and hazardous materials operations. In previous years, Grand County EMS staff serving on the MMRT were provided an annual stipend of \$250 to cover their costs for providing specialized clothing but the stipends were discontinued due to budget constraints. Two MMRT members are assigned to each EMS shift, usually to the same ambulance. MMRT is automatically dispatched to all search and rescue missions with reported injuries. All ambulances are equipped with an MMRT equipment pack. The nearest ambulance will respond to the mission to provide scene size-up and stand by until the ambulance with the MMRT crew is able to arrive on scene to provide the backcountry response.

Denver Health East Grand Medical Center

Denver Health East Grand Medical Center is a licensed community clinic and emergency center



and designated as a Level V Trauma Center located in the base area at Winter Park Resort. The clinic is the primary destination for patients transported from the mountain by ski patrol and accepts ambulance transports originating in southeastern Grand County. According to the most recent designation application, over the year there were 1,752 trauma-related emergency department visits, 167 of which met state registry criteria. Of the 167, 151 were transferred to a higher level of care; 140 by ambulance and 11 by air medical. There was one trauma death. East Grand Medical Center is owned and operated by Denver

Health and Hospital Authority as a satellite facility. The clinic primarily provides family practice and emergency care services for the guests and employees of the resort. Patient volume is closely tied to the number of visitors and varies by season. Winter Park Resort is owned by the City of Denver and tourist visits are expected to increase with the recent change that links Winter Park with 13 other resorts under a common management structure. The clinic is staffed by full-time physicians and mid-level practitioners with back up provided by Denver Health when needed. The facility is funded primarily by patient billings.

Kremmling Memorial Hospital District

Kremmling Memorial Hospital District operates two hospitals in Grand County: Middle Park Medical Center-Granby and Middle Park Medical Center-Kremmling. The facilities are Critical Access Hospitals and designated as Level IV Trauma Centers. Both facilities share a common administrative staff and the emergency departments are staffed by the same physician group. The chief executive officer is affiliated with the Centura Health system. The district also operates an outreach primary care clinic in Winter Park. The facilities are funded primarily by patient billings, grants, donations and a tax subsidy generated by a 7.045 mill assessment on property in the hospital district boundaries.

Middle Park Medical Center - Granby



Middle Park Medical Center-Granby staffs two licensed beds and five emergency department beds, and is the primary destination for ambulance transports originating in much of eastern Grand County. The facility is new and maintained well. According to the most recent

designation application, over the year there were 1,909 trauma related emergency department visits, 91 of which met state registry criteria. Of the 91, 86 were transferred to a higher level of care; 72 by ambulance and ten by air medical. There were no trauma deaths reported. Emergency physician coverage is provided by full-time physicians supplemented by locum tenens emergency trained physicians. Scheduled surgical services are regularly provided by visiting specialists and unscheduled surgical procedures are not generally performed. Middle

Park Medical Center-Granby has an array of diagnostic services including laboratory and diagnostic imaging including CT, MRI and ultrasound capabilities. The range of patient services and physician scope of care have increased significantly in the five years since the facility opened. During our interviews it was clear there are significant differences between the staff at Middle Park Medical Center-Granby and providers at Grand County EMS with respect to the clinical environment for advanced procedures, medical direction during ambulance transport and determination of patient destination.

Middle Park Medical Center - Kremmling



Middle Park Medical Center-Kremmling has 23 licensed beds, of which only 16 are staffed and operational. There are four emergency department beds but no surgical or interventional capabilities at the facility in Kremmling. This facility is the primary

destination for ambulance transports originating in most of western Grand County. According to the most recent designation application, over the year there were 334 trauma related emergency department visits, 54 of which met state registry criteria. Of the 54, 38 were transferred to a higher level of care; 30 by ambulance and six by air medical. There were no trauma deaths reported. At the patient care level, the relationship between EMS and the hospital in Kremmling differs significantly from that at the hospital in Granby. Comments gathered from both parties indicate the EMS providers and hospital staff function more as a team when patients are brought to or transferred from this facility.

Grand County Communications Center

Typical of rural counties throughout Colorado, the Grand County Communications Center is a division of the Sheriff's Office. The dispatch center is located in Hot Sulphur Springs. The dispatch center serves all Grand County public safety agencies, including the Sheriff's Office, three municipal police departments, five fire protection districts, Grand County EMS, Coroner and Search and Rescue, and the National Park Service for joint emergency operations. The Grand County communications system utilizes the statewide digital trunked radio (DTR) system for emergency communications and responder notification. Seven tower sites throughout the county access the statewide DTR system with a VHF radio system providing backup coverage. Due to the local geography, DTR coverage in the county is above average, especially in comparison to many other areas of the state. The VHF system is hampered by having only two towers to cover the county. The VHF system is used for paging all EMS and fire services agencies. The communications center has three Motorola MCC7500 dispatch consoles available that use eFORCE computer-aided dispatch software. Properly trained and equipped emergency medical dispatchers ensure that emergency medical care can begin the moment the dispatcher answers the phone. Grand County Communications Center uses the EMD of Colorado program to help callers provide aid prior to arrival of EMS personnel. Dr. John Nichols serves as medical

director for the emergency medical dispatch program in Grand County. Communications center operations are supervised by a Lieutenant in the Sheriff's Office. Eight full-time dispatch positions are authorized but two positions were vacant at the time of the onsite interview. The communications center is normally staffed by two dispatchers from 7 a.m. to 3 a.m. There is only one dispatcher on duty from 3 a.m. to 7 a.m.

Grand County Office of Emergency Management

The Grand County Office of Emergency Management has the lead role in planning for all hazards, including mass casualty incidents. The county emergency manager is responsible for updates and maintenance of the county emergency operations plan and the annex that addresses mass casualty incidents. The emergency manager also chairs the local emergency planning committee meetings and seems to have an open dialogue with emergency services stakeholders. A unique feature of Grand County is that the Office of Emergency Management is operated under Grand County EMS. The director of the office is also the Chief of EMS, with the designated emergency manager is a lieutenant within the EMS department. The emergency manager is certified as an EMT but his primary focus is the daily oversight of the Office of Emergency Management. The most common risks within Grand County include wildland fires, winter storms and flooding. Emergency management maintains a public website on the Grand County website which includes preparedness information for the public. The basic county Emergency Operation Plan is available on the website and was updated in April 2012. Grand County has a mass casualty plan that was developed over time by evaluating procedures documented by other organizations, including the mass casualty plan crafted by Foothills RETAC and through lessons learned by local emergency service agencies. The mass-casualty annex adopted in November 2003 is still in use.

Fire Departments

There are five fire departments that serve Grand County, primarily to provide wildland and structural fire suppression. The fire departments are automatically dispatched with the ambulance service to motor vehicle crashes to provide extrication and mitigate other hazards at the scene but also respond when Grand County EMS requests assistance. The fire departments appear to have good working relationships with the ambulance service but do not have a formal schedule to regularly train with their EMS counterparts.

East Grand County Fire Protection District

East Grand County Fire Protection District is a Title 32 Special District funded primarily by property taxes supplemented by growth impact fees.



The governing body consists of a five member board of directors elected by eligible voters. East Grand Fire has six full time paid staff and more than 40 volunteers. The district has living quarters in three stations to support a resident program that helps assure apparatus,

equipment and buildings are maintained, while also improving response times and department dedication. One station participating in the resident program, Red Dirt, is operated jointly

with the Grand Fire Protection District. East Grand Fire responded to a total of 330 calls in 2017, with 65 categorized as EMS and rescue responses. The department does not automatically respond on most EMS calls but does respond on motor vehicle crashes, CPR calls, lift assists and upon request by EMS. East Grand Fire currently has 14 EMTs and a few paramedics, although any EMS response is at the basic life support level. Most responders hold CPR and first aid certifications, and those who also work as ski patrollers hold Outdoor Emergency Care certifications. Initial EMT training is available to volunteers, with a tiered system of reimbursement for the cost of the program. EMT recertification is available through Grand County EMS. An annual ambulance refresher is conducted by EMS as well. AEDs are deployed on six apparatus and in all three stations. All members are trained on their use. East Grand Fire participates in various community safety presentations, including child safety presentations for daycare and grade schools, plus an annual school safety day.

Grand Fire Protection District

Grand Fire Protection District is a Title 32 Special District governed by a five-member board elected by eligible voters of the district. The district was formed in 1951 and provides service to an area of 150 square miles in central Grand County. Its predecessor, the Granby Volunteer Fire Department, dates back to 1939, Grand Fire Protection District is currently staffed by four paid personnel, a chief, two



deputy chiefs and an administrative assistant supplemented by 29 volunteer and resident firefighters responding out of two stations. In 2017, there were a total of 191 calls for service, including wildland fires, motor vehicle crashes and hazardous materials responses. A total of 40 of those calls are categorized as EMS and rescue. Grand Fire has a resident firefighter program that provides resident quarters at the Granby and Red Dirt stations to increase the number of firefighters to better meet the needs of the district. Resident firefighters gain experience responding to a wide variety of call types and assist on EMS calls when needed. There are no medical certifications required but all career and volunteer firefighters have current CPR and first aid training. There are also several EMTs on the department. Grand Fire Protection District supports initial EMT training by funding half of the cost and does the same for the BLS refresher course. With Grand County EMS providing most community CPR and first aid training, the department limits its community education and prevention projects to fire and safety matters, mainly through the high school and some businesses. All first due vehicles carry AEDs, and the stations each have an AED that are part of the district's community AED outreach program. Grand Fire conducts its own CPR classes for certification.

Grand Lake Fire Protection District

The Grand Lake Fire Protection District is a Title 32 Special District governed by a five-member board elected by eligible voters of the district. Grand Lake is combination paid and volunteer fire and rescue agency serving the area around the Town of Grand Lake in northeast Grand County and abuts Rocky Mountain National Park. Firefighters provide coverage on a set schedule and through a firefighter resident program. Grand Lake responds to structure and wildland fires, motor vehicle crashes, technical rope rescues and all requests for emergency medical services. While Grand County EMS provides an ambulance and staff to the Grand Lake area, the actual coverage is somewhat sporadic as this unit is frequently in service or assigned elsewhere. The Town of Grand Lake and surrounding area experiences substantial seasonal population fluctuations. The winter population is between 2,000 and 3,000 residents, and the summer population jumps to 8,000 to 9,000, reaching as high as 25,000 during peak times like the Fourth of July. Calls for service fluctuate seasonally as well. Annual call volume totals around 300 with 75 to 80 percent attributed to EMS call types. Grand Lake Fire Protection District currently has a total of 20 active members, eight full-time paid personnel, six firefighters in the resident program and six volunteers. Grand Lake apparatus are equipped as BLS units and 12 of the 20 members are EMTs. Initial EMT training is completed through the program offered by Grand County EMS and supported financially by the district based on longevity or a graduated reimbursement schedule based on service time after the course. Grand Lake Fire Protection District is a state-recognized EMS training group and conducts continuing education mainly in-house via monthly continuing education offerings. The firefighter resident program helps ensure rapid response of apparatus and personnel to the scene of an emergency, while offering firefighter-EMTs a chance to gain experience. Grand Lake is also involved in emergency response pre-planning and provides various public education programs and prevention activities, including free first aid and CPR/AED classes.



Hot Sulphur Springs-Parshall Fire Protection District

The Hot Sulphur Springs-Parshall Fire Protection District is a Title 32 Special District located in central Grand County and is governed by an elected board of five directors. The district encompasses 258 square miles and includes the towns of Hot Sulphur Springs and Parshall along with the surrounding area. Originally formed in 1956, Hot Sulphur Springs-Parshall Fire Protection District is an all-volunteer fire agency responding to all hazards and emergency incidents. The district operates seven apparatus out of two stations; Station 1 in Hot Sulphur Springs, and Station 2 in Parshall. The district currently has 13 volunteer members, which includes a chief, deputy chief and lieutenant. In addition to firefighting certifications, members hold CPR/AED certifications and three members are Emergency Medical Responders. Hot Sulphur Springs-Parshall Fire responded to a total of 77 calls in 2017, 35 of which were for EMS incidents. The district is dispatched for all requests for EMS. Hot Sulphur Springs-Parshall Fire participates in community fire prevention and safety presentations twice a year, and has one CPR/AED instructor who working toward providing community classes. Two apparatus carry AEDs and most public buildings have them as well.



Kremmling Fire Protection District

The Kremmling Fire Department originated in 1946 as an all-volunteer agency. In 1989, the department volunteers organized and created the Kremmling Fire Protection District, a Title 32 Special District funded by property taxes and governed by an elected board of five directors. The district includes 136 square miles around



Kremmling, but serves a response area that extends well beyond its jurisdictional boundaries and encompasses an approximately 360 square mile area of western Grand County. Kremmling Fire has 16 members, including a paid chief, one paid firefighter and a district administrator, supplemented by volunteers. In 2017, Kremmling Fire Protection District responded on 96 total calls, 41 of which are categorized as EMS or rescue. Although Kremmling Fire will respond to EMS calls upon request by Grand County EMS, their primary EMS role is to assist with motor vehicle crashes and perform patient extrication. Kremmling Fire also participates annually with the NFPA and West Grand Schools to conduct fire prevention and fire safety education for all elementary grade levels.

Grand County Search and Rescue

Grand County Search and Rescue is an all-volunteer agency that responds to all incidents requiring search and rescue capabilities, including avalanche rescue, snow evacuation, snowmobile search and rescue, high angle rescue and swift water rescue throughout Grand County. The search and rescue team has been in existence since the late 1970s and was officially incorporated as a non-profit 501(c)(3) in 1985. Grand County Search and Rescue became a fully accredited member of the national Mountain Rescue Association in 1995. The team operates on a small budget funded almost exclusively by donations and grants. The team averages about 50 missions per year with the majority involving snowmobile emergencies. The team is comprised of 50 volunteers, although less than 20 members consistently respond. One unique aspect of Grand County Search and Rescue is the medical technician course Dr. John Nichols developed for team members that consists of 140 hours of medical training specific to search and rescue responses. The agency conducts regular training sessions every week plus one or two Saturdays per month. Overall, about 40 percent of trainings are related to emergency medical services.

Ski Patrols

Ski Granby Ranch

Ski Granby Ranch, located four miles southeast of Granby, is a family-owned resort with 406 skiable acres served by five lifts. The base elevation is 8,202 feet in elevation and the highest lift-accessed point is 1,000 feet higher. The ranch is all private land with over 5,000 acres and includes several miles of Nordic, snowshoe, and mountain biking trails. Granby Ranch Ski Patrol is comprised of 14 paid staff members, 12 full-time and 2 part-time. The medical education standard is the National Ski Patrol Outdoor Emergency Care (OEC) certification although some patrollers are certified as EMTs. The medical director, Dr. Mark Paulson, conducts quality management activities and is involved in regular trainings with the staff. Staff members from Grand County EMS are also used to conduct trainings occasionally. In addition to standard basic life support (BLS) equipment, patient toboggans and snow machines, the patrol has two automated external defibrillators (AEDs). One is deployed on the mountain and the other is kept at the base area. The patrol keeps and trains on an updated MCI plan, which includes preparations for active shooter situations. Due to the close proximity to the ambulance base in Granby, more serious and critical patients are usually transferred directly from the toboggan to an ambulance or medical helicopter. Arriving EMS personnel may be transported directly to incident locations on the mountain, as well. In the off-season, Granby Ranch uses a bike patrol program to access injuries and provide medical coverage for special events.



Winter Park Resort

Winter Park Resort, located in southeastern Grand County, has approximately one million skier visits annually, and offers both winter and summer activities. Open since 1940, Winter Park is one of Colorado's longest continuously operating ski areas. Twenty-five lifts serve a total of 166 designated trails on more than 3,000 skiable acres and an additional 1,200 acres of undeveloped terrain and glade skiing. The base area is situated at 9,000 feet in elevation, and the highest lift-serviced point is 3,000 feet higher. The ski patrol is a blend of paid and volunteer members. The roster included 70 paid patrollers and over 200 volunteers, including 30 junior patrollers. Approximately 20 patrollers are employed year-round. On average, between 20 and 26 paid patrollers are staffed daily for winter operations and augmented by a number of volunteer patrollers. The medical education standard is OEC certification, although some patrollers are certified as EMS providers. An annual two-day medical refresher is held at the start of each season, with one day dedicated to medical and trauma training, and one day for CPR recertification. In addition to standard BLS equipment, patient toboggans and snow machines, the patrol has four AEDs deployed on the mountain, as well as two mechanical CPR devices. Nine additional public access AEDs are located around the base area. The ski patrol also has



the ability to take a physician or other clinical staff directly to an incident on the mountain, if needed. The ski area has two designated zones for medical helicopters on the mountain. On typical weekdays, the patrol transports about 5 to 10 injuries from the mountain. On weekends and holidays the number of transport increases to somewhere between 15 and 30.

Approximately two-thirds of the patients are admitted to the emergency room at East Grand Medical Center. Dr. John Nichols serves as medical director for the Winter Park Ski Patrol. He is involved in the annual refresher training, and conducts quality management reviews of all calls deemed serious and critical. The patrol continues operations in the off-season months providing medical services to the mountain and base area. A bike patrol program is used to access most of the mountain biking trails. Numerous special events require planning and participation from the ski patrol.

Air Medical Services

Grand County has access to numerous rotor-wing air medical providers. Classic Air Medical has a helicopter based in Steamboat Springs and another in Glenwood Springs. Flight for Life Colorado has bases for helicopters in Frisco and Lakewood. North Colorado Med Evac serves Grand County with a helicopter based in Boulder and another in Greeley. These three agencies provide rotor-wing critical care coverage for most of northern and central Colorado as well as parts of Wyoming. Almost all areas of Grand County can be reached within a 20 minute flight time by these providers. All three agencies staff their rotor-wing units similarly with either two flight RNs, or a flight RN and a critical care paramedic. There are additional rotor-wing air medical services based along the Front Range from Denver to Cheyenne that could respond to calls in Grand County if necessary. A number of Colorado-based fixed wing air medical agencies operate out of Centennial Airport with aircraft that are capable of landing at the general aviation airport in Kremmling. Given the short flight times for rotor-wing services, fixed-wing transport is only practical if specialized transport capabilities are needed or if rotor-wing aircraft are not available to fly.

Rocky Mountain National Park

Rocky Mountain National Park encompasses a 415 square-mile area in north central Colorado and includes portions of Boulder, Grand and Larimer Counties. Trail Ridge Road transects the park, connecting Estes Park and Grand Lake. Trail Ridge Road is the highest continuous paved road in the United States, reaching an elevation of 12,183 feet, but is impassable all but a few months of the year. Rocky Mountain National Park reported 4,437,215 recreation visitors in 2017.

Administratively, the park has five divisions. The Resource Protection and Visitor Management Division is responsible for dispatch, emergency medical services, search and rescue, law enforcement, structural fire suppression and management of backcountry and wilderness resources. Rocky Mountain National Park operates a separate VHF communications system and has its own dispatch center. Wireless mobile 911 calls originating in the western side of the park are routed to Grand County Communications Center and must be referred to the park for response. The Estes Park Police Department Communications Center in Larimer County handles 911 calls when the park dispatch center is not in operation. In the developed areas on the

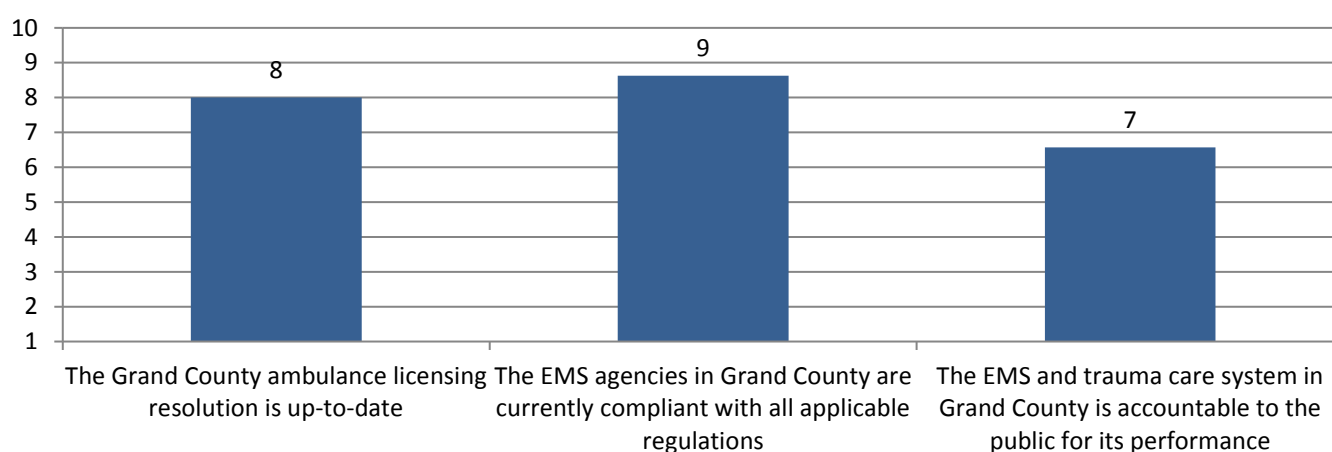
west side of the park, the park dispatches a ranger and contacts Grand County Communications Center to request ambulance and fire first response to calls for emergency medical services. For incidents in the backcountry, the park assigns one ranger to manage search and rescue functions each day and a team of two rangers for a hasty team to provide an initial response for these incidents. Park rangers are incident command for these missions and request assistance from Grand County Search and Rescue or Grand County EMS MMRT if indicated. Park rangers assigned to search and rescue duty are all certified EMTs under National Park Service standards. All of the rangers with advanced life support certifications are assigned to the busier, eastern side of the park. Medical direction for all National Park Service providers is out of the hospital in Estes Park. There are about 30 responses per year on the western side of the park, about 20 in the developed areas and ten in the backcountry. Air medical response within the park boundaries requires the use of an air medical provider agency contracted by the National Park Service and only National Park Service personnel are authorized to initiate an air medical response.

Analysis of Grand County EMTS System Components

Participants from the emergency response system and local health care facilities were asked to complete an anonymous survey rating the current emergency medical and trauma services and relationships in the county. In addition, elected officials and emergency medical and trauma services system stakeholders were interviewed during the on-site consultative visit. The following sections consider survey results, interviews and factual data from a variety of sources.

Legislation and Regulation

10 = Strongly Agree 1 = Strongly Disagree
Responded: 52 of 56



Regulatory Overview

The state of Colorado has full regulatory authority for licensing and regulation of hospitals, skilled nursing facilities, air ambulances and most healthcare agencies. Regulatory oversight for ground ambulances is divided between state and county levels of government. Counties are required by statute to license and regulate ground ambulance services and issue ambulance vehicle permits, while the state has sole authority to set forth rules regulating individual EMS provider education, medical direction and scope of practice. Most counties establish ambulance licensing requirements through resolution or ordinance. Given the continual increase in clinical sophistication and complexity of EMS systems, many counties also formally establish a local, multidisciplinary council to advise the Board of County Commissioners on EMS issues.

Grand County Ambulance Resolution

The Grand County resolution governing licensure of ground ambulance services currently in effect was adopted Dec. 20, 1977. The resolution contains the standard elements seen in similar documents enacted around that time, but does not reflect current emergency medical services standards nor encourage the broad participation necessary for an integrated emergency medical and trauma services system to function effectively. In addition, a number

of substantial revisions to governing law have been enacted over the last 40 years and it appears the resolution has not been amended to conform to the changes.

Grand County has drafted a proposed ambulance resolution to update the rules and standards. The proposed ambulance resolution contains the standard elements seen in contemporary resolutions enacted by other Colorado counties and functionally addresses existing regulatory requirements. Procedures for complaint intake, validation and investigation are improved substantially in the proposed ambulance resolution, and new requirements addressing temporary services provided during special events are reasonable. The licensing fee schedule is not entirely clear in the proposed ambulance resolution and the Board of County Commissioners will need to thoroughly consider the effect of provisions to fund ongoing services in the event of a license suspension or revocation before adoption. State rules pertaining to licensure of ground ambulance services are undergoing a regular, periodic review at the present time and a number of changes are anticipated when the revised rules are adopted by the Colorado Board of Health later this year. The ambulance resolution proposed by Grand County provides an excellent foundation but will likely require minor modification to fully comply with the expected regulatory changes.

Special Districts

The five fire protection districts and Kremmling Memorial Hospital District are all political subdivisions of the state of Colorado, and the citizens elect a governing board that is responsible for collecting taxes and providing services as defined in the district's service plan. Functionally, the service plan is an agreement between the special district and the community it serves. Special district service plans and other foundational documents are routinely reviewed as part of the consultative visit, but the special districts were formed before the current requirement for a service plan was enacted and the Colorado Department of Local Affairs did not have the original service plans on file. The Hot Sulphur Springs-Parshall Fire Protection District, however, amended its service plan in November 2015 with a statement of purpose to clarify its powers and authority. The importance of a current service plan became more significant recently when the Federal Emergency Management Agency used special district service plans to document legal authorization to provide services and determine eligibility for federal disaster reimbursement.

Regional Emergency Medical and Trauma Services Advisory Council

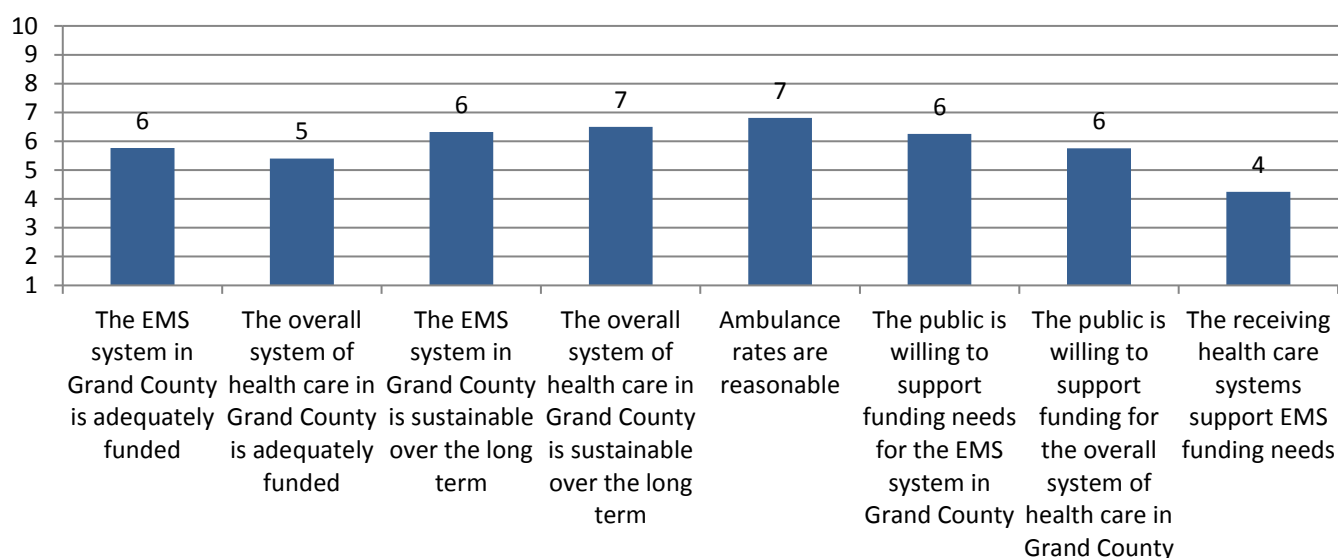
Colorado has 11 regional emergency medical and trauma services advisory councils (RETACs) to help provide a coordinated approach to emergency medical and trauma care. Each RETAC consists of five or more counties that participate through an advisory council and is responsible for creating a regional plan to improve the quality and coordination of emergency medical and trauma services in the region. Each RETAC determines the services it will provide based on the priorities established by the council. For example, the Foothills RETAC contributes to emergency medical and trauma services research, offers medical direction resources and provides a comprehensive mass casualty incident plan for counties in the region. Grand County has appointed representatives to the Foothills RETAC and they actively participate in council activities.

Recommendations

- Update the Grand County ambulance licensing resolution to comply with governing law and current practices. Adopt an ambulance licensing resolution that addresses anticipated changes in state rules pertaining to licensure of ground ambulance services planned for adoption by the Colorado Board of Health later this year.
- Consider establishing a county emergency services council in the updated ambulance licensing resolution. This council should be authorized to advise the Board of County Commissioners on emergency medical and trauma services and regularly report the current system status to the Board. Empower the council to recommend priorities for local system development and prioritize requests for supplemental funding. All agencies providing any level of emergency medical and trauma services in Grand County should have representation. Membership should include licensed ambulance services, public safety communications, fire rescue agencies, designated trauma centers, air medical, search and rescue, ski patrols, EMS medical direction, local emergency management and public health.
- Each special district providing emergency medical and trauma services in Grand County should review its service plan, update if indicated and file the revised service plan with the Colorado Department of Local Affairs. Although the services currently offered are authorized by statute, a plan that addresses all current and future services will increase transparency for this level of government and enhance reimbursement if district resources are ever called to assist with a declared federal disaster.

System Finance

10 = Strongly Agree 1 = Strongly Disagree
Responded: 52 of 58



System Finance

The emergency medical and trauma services system providers were consistently helpful and worked in a collaborative manner with the consultative visit team. Most of the emergency medical and trauma services agencies based in Grand County are local governments but those that are not still receive some form of subsidy to provide services. The system is funded through the traditional sources including user fees, sales and use taxes, property tax levies, governmental transfer payments, public or private grants and donations.

Grand County EMS

Grand County EMS has an annual operating budget of about \$3.3 million funded predominately through user fees and a property tax subsidy. Grand County EMS works diligently to maximize revenues from user fees. The billing rates were reviewed recently and the current rates are slightly above average for the region. The payer mix was reported to be 67 percent commercial insurance, 19 percent self-pay, 11 percent Medicare and two percent Medicaid. The very low percentage of Medicare and Medicaid patients is advantageous as is the relatively high proportion of patients with commercial insurance. The billing staff receives regular education in modern billing processes to include proper ambulance coding for each call. The staff process, code and distribute bills in a timely manner, then track collections, manage contractual write offs and hardship discounts and refer any need for delinquent collections to an external collection agency. The rigorous billing practices coupled with a favorable payer mix earns them a collection rate of 75-80 percent, which is tremendous when compared to many EMS systems across the state. In an effort to assure maximum revenues from user fees, Grand County EMS recently explored the feasibility of outsourcing the billing process. After comparing the expected revenues from third-party billing company to the results produced by the well trained staff and long standing collection practices that have proven effective, Grand County EMS determined outsourced billing would result in decreased revenues. The internal billing system was retained although staffing has been reduced from four to two. In addition to sound billing practices and exceptional collection rate, the level of fiscal accountability and budget adherence is excellent. Grand County EMS generates a detailed report of revenues and expenses monthly and performance is evaluated against budget benchmarks. The report is reviewed by department management and provided to county administration.

The voters of Grand County supported a 2 mill property tax dedicated to support emergency medical services in 2003. This tax subsidy has been important to maintain this essential public service. This tax levy is expected to generate about \$1.4 million in 2018 although this amount is expected to decline in the next few years as the residential assessment rate is expected to decrease due to constitutional limitations.

Numerous stakeholders expressed a variety of opinions on how to reduce the cost to provide ambulance service in the county. Reductions in administrative staff were mentioned. The administration for Grand County EMS appears to be staffed at a reasonable level for the size of the operation. It would not be unusual for an organization of this size to have a chief and deputy chief to administer the organization and three operations supervisors, one per shift, to coordinate the daily operations during their tour of duty and function clinically if needed by covering a shift or staffing up a reserve vehicle during times of unanticipated peak demand. At

Grand County EMS, the emergency manager is a bit of an anomaly but that position is needed to administer the Office of Emergency Management and the county would still bear the associated costs if the position were moved to another department. Likewise, outsourcing the EMS continuing education function would not result in significant cost savings. Partnering with a hospital system that would supply EMS continuing education and skill competency testing at no charge would not entirely eliminate the need for the hours allocated to that position. The health care organizations that offer these services for free have a limited staff that shares the workload for a substantial number of participating agencies. The continuing education is typically generic lectures with limited opportunity for hands-on skills practice so the content can be presented to a large number of diverse agencies. Quality management activities they provide are minimal and not sufficient for agencies like Grand County EMS that are performing clinically-sophisticated advanced procedures with scope of practice waivers. Grand County EMS concentrates on helping their field providers maintain confidence, competence and knowledge base, all of which will diminish over time without constant focus on improvement. Grand County EMS has a knowledgeable medical director who devotes a tremendous amount of time to be present with his field providers. It is essential to have a dedicated employee to focus on clinical education and quality management activities for the organization.

Another suggestion was to reduce the cost to provide service related to purchases of vehicles and equipment. The ambulances and equipment appeared to be typical, industry-standard equipment. The most recent additions to the ambulance fleet were manufactured by American Emergency Vehicles (AEV) in North Carolina. AEV manufactures standard quality ambulances constructed in accordance with applicable safety standards at a modest price. These ambulances were built on a crew cab chassis, a configuration that is becoming more prevalent, especially with critical care transport teams, because it allows the ambulance to more safely transport additional crew members in the vehicle cab. The equipment purchases appear to be just as reasonable. The ambulance cots with power-assisted lift are in common usage across the country and are becoming the industry standard because these devices tend to reduce the incidence of work-related back injuries. Similarly, the portable cardiac monitor-defibrillators are the standard configuration used on paramedic ambulances across the country. As a responsible ambulance service, it appears that Grand County EMS does an above average job of taking patient and provider safety into account in all aspects of their strategic planning process, including the purchase of vehicles and equipment.

There was a concern among some stakeholders that the financial support provided to Grand County EMS is not adequate. The volume of EMS calls is increasing but no additional resources are being developed to meet the growth in demand for services across a very large service area. Even now, heavy demand in the central and eastern portions of the county often results in units being pulled from the west and north, causing longer response times during peak periods. Grand County EMS is maintaining its stability now but there are continuing pressures on future funding. The growing number of interfacility transports combined with the lack of personnel living in the county creates a need for additional paid staff. The need for properly fitted personal protective equipment to shield field staff from broken glass, jagged metal, vehicle fluids, hot objects and other hazards places additional demands on the agency's financial resources. Vehicles and equipment are current but many of the facilities are sorely

outdated and in need of replacement. The current facilities are no longer adequate for vehicle storage and security, and are strained to provide reasonable living conditions for personnel who are expected to function for 48 hours at a time. Garnering the resources to upgrade stations while maintaining the level of service will be an ongoing challenge for years to come.

Kremmling Memorial Hospital District

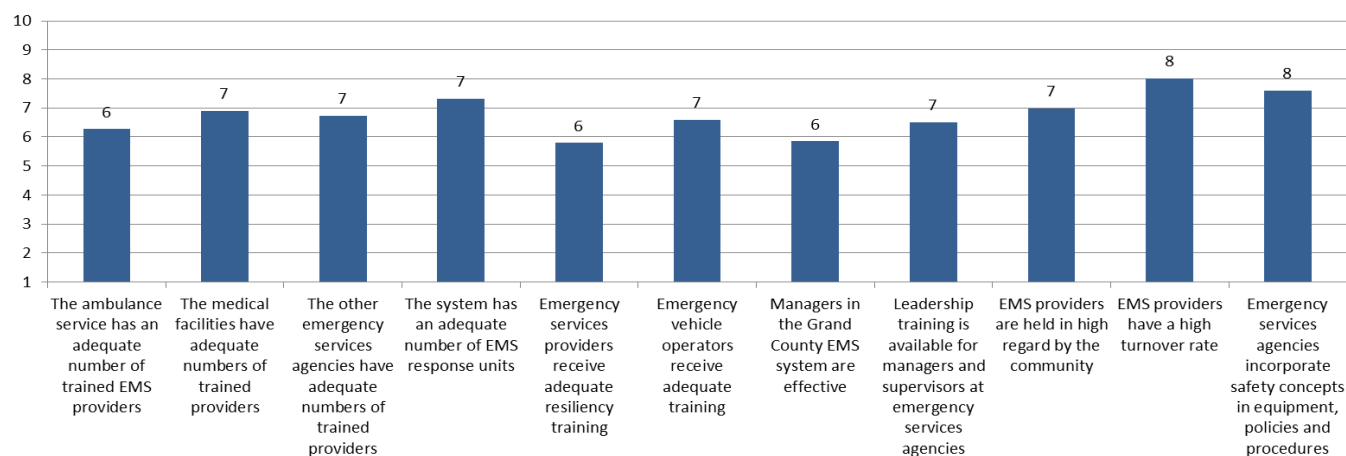
Kremmling Memorial Hospital District is a special taxing district that operates two hospitals in Grand County: Middle Park Medical Center-Granby and Middle Park Medical Center-Kremmling (formerly known as Kremmling Memorial Hospital). The district has an annual operating budget of about \$28.3 million funded predominately through user fees. The hospital district also levies a tax of 7.045 mills on properties included in the district boundaries that generated revenues of about \$1.2 million in 2017. In general terms, the district includes the western half of Grand County and the northern third of Summit County. Kremmling Memorial Hospital District funded the construction and operation of Middle Park Medical Center-Granby, even though the health district boundaries do not extend into that portion of Grand County. This endeavor was certainly an opportunity for the district to grow and provide needed services to the eastern part of the county. It was also a strategic move to capture market share and retain patients and health care dollars within Grand County. Incorporating the eastern half of Grand County into the hospital district was not feasible because an inclusion election was likely to fail due to the negative fiscal effect on property owners.

Recommendations

- ✿ Grand County EMS should consider increasing the billing staff by one person. As call volume increases, it is important to have adequate staffing in the area that brings in revenue. There are also operational inefficiencies that occur when one of the two people with special training are out for vacation, illness or injury. Timely submission of claims, accurate coding and maintenance of follow-up processes slow down considerably when staffing is reduced, even temporarily, to just one person. It also increases the likelihood for errors. These factors will ultimately decrease the collection rate and significantly reduce customer satisfaction.
- ✿ The county should review the amount and distribution of federal payments in lieu of taxes to determine if current allocations are consistent with the services provided to the federal lands and increase the allocation for Grand County EMS as indicated. Ambulances regularly respond to calls in Rocky Mountain National Park, Arapaho, Routt and White River National Forests, Bureau of Reclamation facilities and Bureau of Land Management properties.
- ✿ Continue to seek grant funding to assist with specific projects. Poring over grant program eligibility guidance is tedious, but perseverance may pay off with funding assistance. Consider local foundations and review the Colorado Grants Guide periodically to identify if any new grant opportunities have emerged. The Colorado Grants Guide is available online for a fee but can be accessed free at almost any public library.
- ✿ At some point, it may be necessary to consider going to the citizens and asking for an increased mill levy to support Grand County EMS. This would likely not be an option in the near term and will require significant advanced planning to identify methods of educating the voters about a mill levy increase in terms of service delivery and enhanced value to the community.

Human Resources

10= Strongly Agree 1 = Strongly Disagree
Responded: 52 of 58



Human Resources

The emergency medical and trauma services system in Grand County is staffed by a combination of volunteer, part-time and full-time providers. The stakeholder interviews clearly demonstrated the providers are dedicated to serving the community and generally held in high regard.

The current leadership for Grand County EMS has turned a historically challenged ambulance service into a functional EMS agency. The medical director and senior administrative staff collaborate extensively and are engaged and passionate about improving patient care in the area. This dedicated group has been instrumental in advancing the ambulances, equipment, staff training, clinical care platform, quality management and community outreach.

Historical call volumes, transfer volumes and seasonal locations of increased resource needs are considered to determine staffing levels. At present, Grand County EMS staffs four paramedic ambulances 24/7 five days per week but cuts back to three staffed ambulances on two days during the middle of the week. An additional paramedic ambulance is staffed on weekends bringing the total number of staffed ambulances to five. This configuration diminishes coverage from historic level mid-week when call volume typically is lower. With current patterns in the demand for services, the practical effect of these changes from a patient perspective is expected to be minimal. The administrative staff can be called into service to staff an ambulance and respond from the headquarters in Granby in the unlikely event that more capacity is needed during the week, for example. Grand County EMS continues to monitor call volume levels by time of day and day of week and the trends are pointing towards the need to staff an additional ambulance. The staffing pattern for the ambulance stationed in Grand Lake, the response area with the lowest annual call volume, is also currently under review. Exploring options to fund additional capabilities will be required in the near future to maintain current levels of service.

Employee turnover has been a persistent problem at Grand County EMS. In 2017, the turnover rate was nearly 40 percent, much higher than the historical rate of between 20 and 25 percent. The majority of this turnover was attributed to positive personal reasons. Many employees left to pursue career opportunities that offered higher pay or more interesting work. Most stakeholders acknowledged that it was difficult to retain reliable employees in Grand County and had experienced similar difficulties in their own organization. The level of compensation is clearly an issue and is further exacerbated by the relatively high cost to live in Grand County. EMTs make about \$34,000 annually with paramedics making just under \$45,000 per year. Pay is only one aspect of job satisfaction but, to be competitive with private services in the metropolitan areas, EMTs should be making closer to \$39,000 and paramedics should be making just over \$51,000 to start. Grand County also has limited services and fewer opportunities for other members of an employee's family. The regular work schedule was recently changed from 48 hours on/96 hours off to 48 hours on/120 hours off. The new schedule offers employees tremendous personal flexibility and has been well received by the staff. This schedule offers the opportunity for employees to reside outside Grand County in an area that offers better options for other members of the employee's household. It also provides ample time for employees to volunteer, travel or engage in other activities that bring personal satisfaction and still work full time for Grand County EMS. There is some downside to having staff who do not reside in the area. From a practical standpoint, they are not readily available for recall to address unanticipated peaks in demand for 911 services. Nonresident staff also do not have as many opportunities to become part of the fabric of the community and gain intimate knowledge of the area in the same way as a resident.

Substandard crew quarters are also an impediment to employee retention. The sleeping quarters are not adequate. There are concerns that the crumbling infrastructure may contain asbestos or other dangerous compounds. EMS providers spend long hours being prepared to respond, and lack of internet access makes it difficult to stay current with world and local events or maintain contact with friends and family members during downtime. People are naturally more comfortable working with other people they know. Diminished communication between providers in facilities and providers working in the field are another side effect of employee turnover.

The high school EMT program was widely praised and had strong support from the stakeholders. This program was viewed as a good feeder system for Grand County EMS and other public safety agencies as well as increased overall emergency capabilities for the community. Five graduates of the program are now full time employees of Grand County EMS.

The Mountain Medical Response Team (MMRT) was designed to enhance medical response in the backcountry by supplementing the technical expertise of the search and rescue teams with the medical capabilities of the EMS providers. There was some concern from stakeholders that this program was not receiving the requisite ongoing support. There was more than one example of situations where MMRT responders were not prepared physically or lacked the proper equipment for some of the rigorous and extended requirements of backcountry search and rescue operations. In previous years, Grand County EMS staff serving on the MMRT had more stringent physical standards and every ambulance was equipped with a fully-stocked

MMRT equipment pack. MMRT members were also better prepared for adverse conditions before the annual stipends were discontinued due to budget constraints.

Grand County EMS has an extensive department policy guide to compliment the county personnel manual. The policy guide covers a broad array of topics and most of the guidelines provide reasonable guidance for the employees. During the on-site visit, the employees expressed that command staff is very focused on safety and that message is evident throughout the policy guide. The industry is expanding the concept of safety to include resilience training to mitigate the cumulative effects of repetitive physical and emotional stress inherent to the job. This perspective is not clearly articulated in the policy guide. There is a formal on-boarding and orientation process in place and milestones are recorded in the employee's field training book although strict adherence to this guideline has faltered due to recent turnover. Secondary employment is peripherally addressed in several guidelines and may become a more significant concern with the new work schedule. The new work schedule also functionally expands the locations where employees may choose to reside. Issues related to recall for MCI events, frequent road closures or travel restrictions on routes of travel to Grand County, and influence of long commutes on suitability for duty are inherent to this increased flexibility and will likely require some attention.

During the stakeholder interviews, there were indications that communications between field providers and command staff could be improved. The requirement that every shift begin at the main headquarters is not viewed as effective. Meeting in person at the station in Granby takes the ambulance and crew out of district for an extended period and the officer of the day often is not available when scheduled. Communications also tend to be more top-down and lack input from field staff prior to a final decision or policy being put in place. The rationale to support the decision is often not shared with the field crews. In addition, as the number of employees living outside Grand County increased, the official channels of communication did not evolve and take advantage of new technologies.

Some stakeholders from outside of the organization raised the issue about the two related individuals in the command structure at Grand County EMS. No specific actions were identified to have taken place that were inappropriate and no concerns were expressed during stakeholder interviews from within the county government or Grand County EMS. Further investigation revealed that this had been a long-standing arrangement and the Board of County Commissioners had approved the arrangement when the EMS director was hired.

The medical facilities did not indicate there were any systemic concerns and human resource issues were not further evaluated for these organizations.

Recommendations

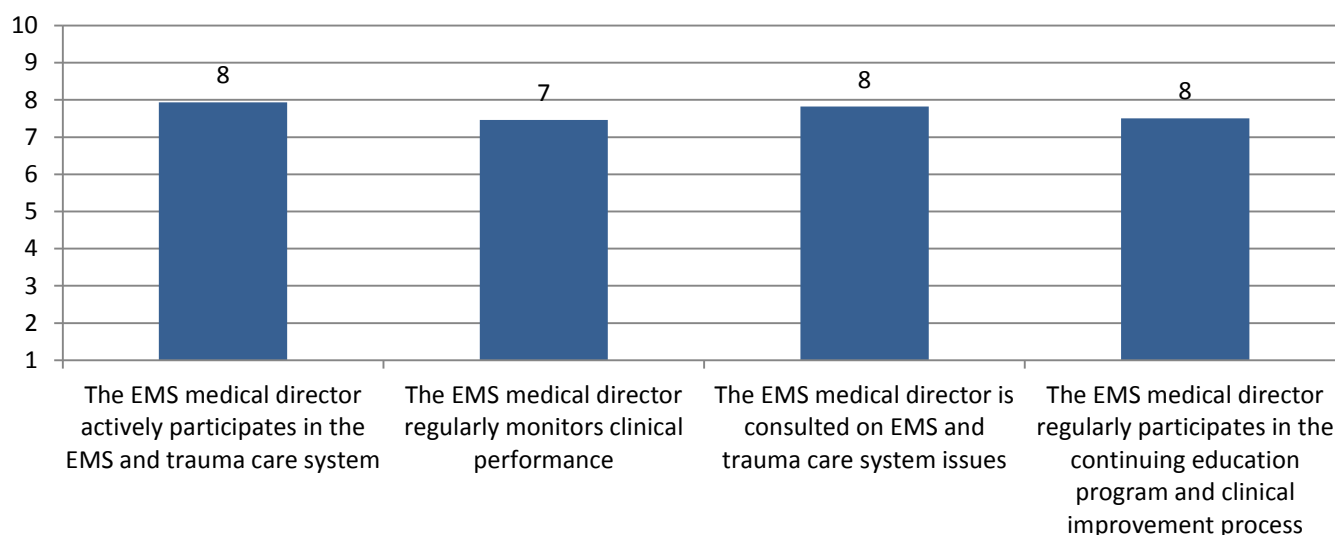
- ✱ Recruit and assist Grand County residents to become part of the emergency medical and trauma services system. Continue to support the initial EMT training program in the high schools. This program is highly regarded throughout the county and has clearly demonstrated its success by the five current staff members at Grand County EMS who graduated from the program. Maintaining a sufficient proportion of staff that lives in the

area is also important to build a resilient system that has reserve capacity to step in to meet extraordinary peaks in service demand that happen from time to time.

- ✱ Continue to conduct exit interviews with each employee leaving Grand County EMS. Develop a formal process to track the reasons staff leave to help identify specific actions that could be taken to reduce turnover. It is not important to completely differentiate every reason for separation in painstaking detail but grouping them into general categories (i.e. compensation, limited opportunities for others in employee's household, etc.) would provide useful information to identify any trends. While every EMS agency is different and has its own specific challenges, identify services with similar characteristics for comparison. Internal tracking is valuable but having an external benchmark will help identify what is within normal range.
- ✱ Conduct "stay" interviews with Grand County EMS staff on an annual basis. These interviews provide the opportunity to determine what is important to employees and see what can be done to retain current staff members who are considering leaving. Stay interviews have a specific purpose and should not be performed in conjunction with periodic performance evaluations.
- ✱ Engage the Grand County EMS field staff to explore alternative methods to effectively conduct official communications and beginning of shift processes. Recognize that multiple platforms may be required to optimize messaging across a diverse range of age groups and varying levels of technical sophistication.
- ✱ Refine the Grand County EMS onboarding and orientation process and apply it consistently. Responsibility for these processes may be vested in one person although the process should be well-documented so that if the lead person is not available, the welcome and education of new employees, and assurance of their competency, is not compromised.

Medical Direction

10 = Strongly Agree 1 = Strongly Disagree
Responded: 52 of 58



Medical Direction

There are three physicians providing medical oversight for the emergency medical services agencies in Grand County.

Dr. Scott Chew is Board Certified in Emergency Medicine and serves as the medical director for Rocky Mountain National Park. He attended medical school at the University Of Colorado School of Medicine and completed his emergency medicine residency at Henry Ford Hospital in Detroit, MI. Dr. Chew practices at Estes Park Medical Center, near the east entrance to the park. He serves as chair for the Northeast Physicians Advisory Board, the coordinating body for EMS medical direction in the Northeast Colorado RETAC, and provides medical direction for seven other agencies in Larimer County.

Dr. John Nichols is Board Certified in Neurological Surgery and serves as the medical director for Grand County Communications Center, Grand County EMS, Grand County Search and Rescue and the ski patrol at Winter Park Resort. He attended medical school at the University of Texas Southwestern Medical Center at Dallas completed his residency at the University of Colorado Health Sciences Center. Dr. Nichols practices at a number of facilities in the Denver metropolitan area but does not have privileges at any of the facilities within Grand County. He has maintained a home in Grand County and spends a significant amount of time in the county. Dr. Nichols does not have formal training in emergency medicine or EMS medical direction although he has considerable experience in EMS policy through his past service on the State Emergency Medical and Trauma Services Advisory Council. He is clearly dedicated to the community and is a valuable leader in the area. The field providers at agencies supervised by Dr. Nichols expressed that he is very engaged and highly supportive. The field providers characterized him as very accessible if any of them had questions or concerns between routine meetings. Dr. Nichols is current with requirements to serve as an EMS medical director and is actively involved with his agencies to provide regular trainings, chart reviews, protocol development, quality management and other aspects of EMS medical direction. He is not compensated for the medical direction services provided to the agencies in Grand County. Dr. Nichols is widely recognized as having increased the quality of services and enhanced the scope of services provided to Grand County. Almost all stakeholders noted the great advancements of the emergency medical and trauma services system that occurred under his medical direction.

Dr. Mark Paulsen is Board Certified in Family Medicine and serves as the medical director for Grand Lake Fire Protection District and the ski patrol at Ski Granby Ranch. He earned his undergraduate degree at the University of Denver, attended medical school at the University of Colorado, School of Medicine and completed his family practice residency in Fort Collins. Dr. Paulsen practices at Middle Park Medical Center. Dr. Paulsen does not have formal medical training in emergency medicine or EMS medical direction.

EMS medical direction in Grand County is not coordinated among the agencies and there is no formal avenue for input from the physicians or medical facilities serving the community. Each medical director has independently established protocols for the emergency response agencies under his supervision, and there is no established forum where the medical directors can collaborate. None of the emergency response agencies expressed concern that this lack of

structure has led to adverse outcomes, although Middle Park Medical Center has expressed several concerns. Field providers typically contact the destination facility for clinical advice or medication orders on patients who will be transported. Middle Park Medical Center-Granby serves as the primary point of on-line medical control for patient refusals and field pronouncements. Several of these physicians expressed that they were not familiar with the scope of practice for individual EMS providers and a copy of the Grand County EMS protocols was not available for them to reference when providing on-line medical direction. The physicians practicing at Middle Park Medical Center expressed a desire to have some participation in the development or review of the medical treatment protocols used by Grand County EMS to ensure capabilities of the local facilities are considered.

None of the medical directors actively participate in the Denver Metro EMS Medical Directors, the coordinating body for EMS medical direction in the Foothills and Mile-High RETACs, and had not made use of the resources available to provide support through the Foothills RETAC regional medical direction program or the state Emergency Medical and Trauma Services Branch.

Recommendations

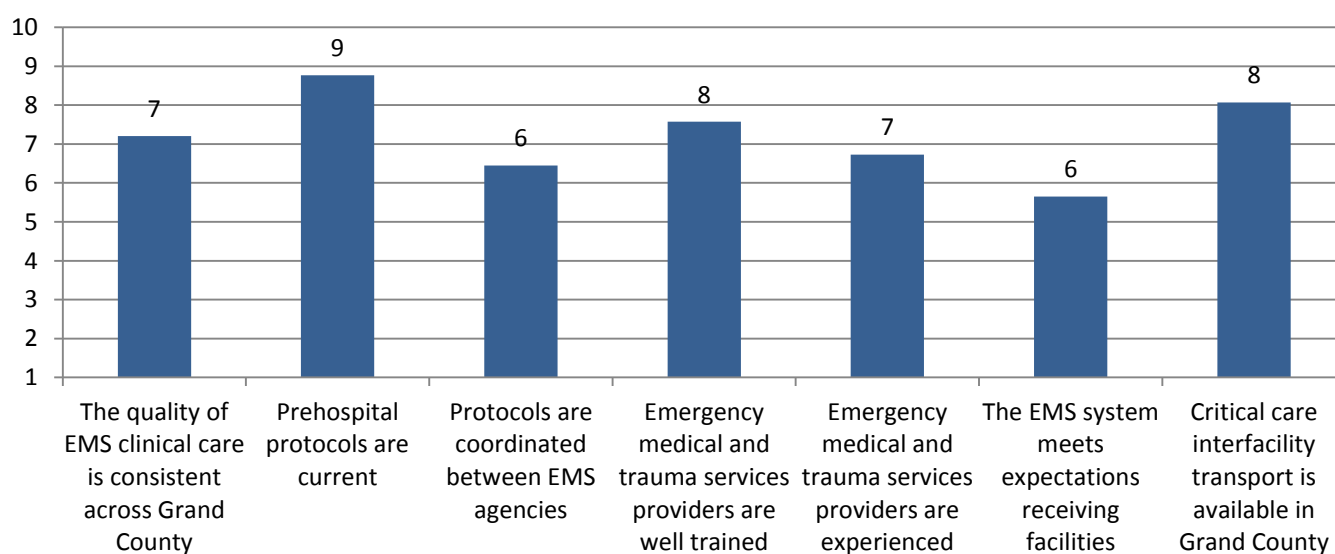
- ✱ Initiate communication and collaboration between the EMS medical directors in Grand County. Enhanced cooperation between the medical directors will help to ensure care is provided consistent with community expectations everywhere in the county, enhance quality of medical direction through sharing of best practices and reduce duplicative efforts. Dr. Chew will be a valuable resource through his experience with the more collaborative medical direction programs in Boulder and Larimer Counties and the Northeast Colorado RETAC. Having EMS medical directors located on both sides of the Continental Divide creates some logistical challenges but it should be possible for this small group to equitably share the burden of travel or conducting meetings remotely.
- ✱ Unify medical treatment protocols for all agencies in Grand County. Standard, countywide protocols provide a number of benefits. First and foremost, they establish a uniform standard of care for all patients encountered by EMS, regardless of provider, that is consistent with the expectations of the local health care community. The majority of EMS protocols are developed based on the scope of practice for EMS providers as established by regulation and share common elements. Standardizing protocols that comprise the core of EMS practice reduces the amount of time each individual agency medical director must devote to protocol development. Consistent protocols also simplify on-line medical direction. The physician in contact with EMS providers in the field only has to be familiar with one set of protocols to provide sound advice consistent with EMS scope of practice and the principles of patient care established by the agency medical director.
- ✱ Increase participation in the Denver Metro EMS Physicians by Grand County EMS medical directors to develop a network of colleagues and make better use of resources offered by the Foothills RETAC regional medical direction program. This group will also help Grand County EMS medical directors keep current on advances in the EMS scope of practice, protocol development, new regulatory requirements, share his experience keep abreast of current trends occurring in surrounding counties and other topics.
- ✱ Establish a forum for collaboration among the agencies in Grand County for EMS medical direction to facilitate peer communication, provide resources to help agency medical

directors, facilitate local EMS quality management activities, promote standardization of protocols for consistent levels of service and training for EMS providers and facilitate communications with the local health care community.

- ✱ Recruit a local physician to serve as an assistant EMS medical director for Grand County EMS to facilitate communications with local physicians, ensure EMS protocols are consistent with the local medical care standards and stay current with the capabilities of local medical facilities. The assistant EMS medical director can also provide outreach to increase knowledge of the EMS protocols for physicians who provide on-line medical direction for the EMS providers in the field and build collaboration and communication among the local medical community.
- ✱ The EMS medical directors in Grand County have been generous with their time to serve the community by supervising the EMS providers. However, they should consider further formal training, when possible, such as completion of an EMS Medical Directors training course through the American College of Emergency Physicians, attendance at the Medical Director's Forum at the state EMS conference or other programs to build the skills to effectively provide EMS medical oversight.
- ✱ None of the EMS medical directors in Grand County receive compensation for services. If the current model for medical direction is continued, the EMS community should consider some type of financial stipend. The physicians currently providing medical direction have very busy practices without their EMS responsibilities and a stipend may compensate them for their commitment or least convey gratitude for the time they devote to EMS. Furthermore, the lack of a stipend to provide local medical direction could potentially create significant issues when an agency is faced with a transition of medical direction or an urgent need to find a successor or replacement medical director. Compensation for EMS medical direction helps to ensure long-term sustainability for this essential component.

Clinical Care

10 = Strongly Agree 1 = Strongly Disagree
Responded: 52 of 58



Clinical Care

Emergency medical services systems provide access, instruction, emergency response, patient care and transport to a medical facility for those with a real or perceived emergency. When appropriate and available, local EMS agencies provide emergent and non-emergent transportation to regional centers with higher-level care and centers of excellence for specialty care. Immediate availability and mobility is what distinguishes EMS from other components of the health care system.

Stakeholders generally felt that the clinical care was good at both the basic- and advanced-life-support levels. Grand County EMS is the primary response agency to all requests for emergency medical services and typically responds with a paramedic ambulance. The service has secured a number of waivers that allow appropriately-trained providers to perform above the paramedic scope of practice. The fire department in Grand Lake provides EMT first response care on EMS calls in their district and Hot Sulphur Springs-Parshall Fire responds in their coverage area with volunteers trained at the EMR level. Both ski patrols provide BLS level care with EMT- or OEC-trained providers. The other fire departments normally are only called to respond for motor vehicle crashes unless requested by the ambulance service for other types of calls. These departments will respond to provide basic first response care when EMS units are not available or delayed. An ambulance is called to stand-by at fire scenes or as requested by the fire department for other situations.

The consultative visit is focused on analysis of the local emergency medical and trauma services system, and as such individual clinical care was not evaluated directly. During the site visit, physicians from Middle Park Medical Center cited several cases where there were concerns about the clinical care and judgement of Grand County EMS providers. These cases had been brought to the department's attention previously and have been evaluated through the regular investigative process. The other facility in the county expressed there were no concerns involving clinical care by EMS providers from Grand County EMS.

Grand County EMS typically staffs four paramedic ambulances per day with additional units scheduled at peak times. The general coverage pattern with ambulances stationed in Granby, Grand Lake, Fraser and Kremmling reflects call density and provides reasonable response to most areas of Grand County considering geography. As expected, longer response times are seen in the more rural portions of the county. Overall, the reported dispatch to en route times and dispatch to on scene times in Grand County are reasonable and on par with agencies using a comparable service delivery model serving communities with similar population and geographic characteristics.

Air Medical Services

Grand County has had reasonable access to rotor-wing air medical services for decades from the aircraft based in Frisco. Capabilities for scene response by air medical increased dramatically when a helicopter base was established in Steamboat Springs and, more recently, in Boulder. Flight times to scenes in most areas of Grand County are now short enough that air medical can realistically be used to transport patients with time-sensitive syndromes directly from a scene to definitive care. Appropriate use of air medical services will become more important as capabilities to treat time-sensitive syndromes improve throughout northern

Colorado. The procedure for requesting air medical response varies by agency. First response agencies notify the Grand County Communications Center that air medical is needed on the channel assigned to the incident and communications center personnel call the dispatch center for the air medical agency. When an ambulance for Grand County EMS requests air medical, the ambulance uses the EMS tactical frequency to contact the captain on duty who then calls the dispatch center for the air medical agency. The EMS captain subsequently advises Grand County Communications that air medical has been called. Occasionally, the Middle Park hospitals request an air medical response to their facility in anticipation that the patient will need to be flown to definitive care after initial stabilization. The National Park Service has a regimented process that requires a National Park Service employee contact the park dispatch center to make the request for a contracted air medical provider. The medical facilities call the dispatch center for the air medical agency directly by telephone. This multifaceted approach has led to some confusion on several calls and required a flurry of telephone calls to sort out the extent of air medical resources that were needed. There were also examples of one agency overriding another agency's request for air medical without any direct communication between the two agencies. The Grand County EMS operational guideline for destination determination provides limited guidance on the indications and procedure for activating a scene response for an air medical helicopter.

Another discontinuity in care was identified in the transfer of care between Grand County EMS and an air medical provider. The flight crew was not always immediately integrated in the care of the patient when they arrived on scene. This occurred because Grand County EMS identified the ambulance crews only had problems with the performance of a medical procedure when the flight crew arrived and engaged the patient while the procedure was in progress. In an effort to eliminate problems with the procedure due to this factor, Grand County EMS modified the process to exclude other providers and prevent them from engaging with the patient until the procedure was complete. The modified process, however, impedes the efficient transition of patient care and alienates the flight crews, resulting in tension between the agencies.

Protocols

Rocky Mountain National Park uses protocols provided by Dr. Chew that are very similar to those used by Larimer County and other EMS agencies in Northeast Colorado. These medical treatment protocols are current and reviewed regularly. They are consistent with the rest of the Northeast region except for minor changes designed to meet specific requirements of the National Park Service. Dr. Chew is the current chair of the Northeast Physician Advisory Board, the group established to coordinate EMS medical direction in the Northeast Colorado RETAC, and is very experienced at keeping protocols up-to-date and aligned with best practices for the industry. Agencies under the medical supervision of Dr. Nichols have robust and current medical treatment protocols specifically designed to meet the needs of the agency. These protocols were created internally and are reviewed regularly. Grand County EMS is Dr. Nichols' most active agency and encourages its personnel to propose protocol changes or implementation of additional interventions. Dr. Nichols insists on detailed clinical research reports to be developed before proposals are considered, and it is essential that proposals define the rationale for the change and clearly demonstrate the need. Grand County EMS

attempts to be up-to-date with changing best practices, and utilizes national conferences and specialized trainings to keep staff proficient. This protocol development process differs from most of the agencies in the Foothills RETAC that base their patient care protocols on the Denver Metro EMS protocols that are modified as needed to meet the specific circumstances. Medical treatment protocols for agencies under the medical supervision of Dr. Paulsen are based on the Denver Metro EMS protocols with some minor modifications. They are consistent with the rest of the region, although they vary from other agencies in the county. The Denver Metro EMS Medical Directors is a large group of dedicated EMS medical directors and helps keep these protocol up-to-date and aligned with best practices for the industry.

Interfacility Transports

The medical facilities in Grand County have limited scope and must transfer a significant number of patients to tertiary care and specialty centers on the Front Range. Interfacility transports comprise more than 30 percent of the Grand County EMS call volume each year. These calls require skilled crews capable of maintaining treatments initiated at the originating facility and typically require a paramedic and often a paramedic with expanded scope of practice. Due to the distances, time of day, wildlife activity, traffic and weather conditions, these transports present unique hazards to the patients and ambulance crews. To mitigate these risks, Grand County EMS generally will not accept requests for interfacility transfers to destinations outside Grand County at night. This policy is not popular with the hospitals and has been a source of friction between the organizations. There does not appear to be a formal process for determining the appropriate method of transport; rather, transport decisions seemed to be based more on the availability of a particular resource rather than through a collaborative process involving all affected agencies. The Grand County EMS operational guideline for interfacility transports only provides limited guidance to assist with decisions about out-of-county interfacility transports.

EMS Dispatch

EMS dispatch services are handled by the Grand County Sheriff's Office Communications Center. An emergency medical dispatch protocol is utilized that arrives at a response determinant but the emergency response agencies in Grand County have not assigned resources and a mode of response to these determinants to guide responding agencies. The communications center is also prepared to offer citizen bystander CPR instructions in those cases that are presumed cardiac arrest. Retrospective review of dispatch records to assess compliance with emergency medical dispatch protocols is conducted internally. Incoming 911 calls and communications between dispatch and response units in the field are recorded. Radio and wireless telephone communications between field providers and medical control at the hospitals are not recorded.

Use of Lights or Siren during Response or Transport

About half of scene responses for Grand County EMS involve an emergency (lights and/or siren) response. Emergent returns to the hospital are reported to be about 4 percent of calls although the validity of that number is uncertain because transport mode was not reported on 38 percent of the calls. Operating an emergency vehicle with lights or siren during response or patient transport is associated with a higher risk of being involved in a traffic crash. Grand

County EMS is to be commended for utilizing non-emergent transport mode the majority of the time, but there are ample opportunities for reducing the use of lights or sirens overall through a collaborative effort between the communications center, ambulance services and medical direction.

Ambulances

The ambulance fleet in Grand County is composed entirely of conventional Type I ambulances constructed by final stage manufacturers registered with the National Highway Traffic Safety Administration in accordance with applicable safety standards. Usage varies across the fleet with proportionately higher mileage on the units used predominately for interfacility transports. The most recent acquisitions to the fleet were built on a crew cab chassis. This configuration is becoming more prevalent, especially with critical care transport teams, because it allows the ambulance to more safely transport additional crew members in the vehicle cab. The crew cab also has the capability to carry bulky personal protective equipment in a temperature-controlled area segregated from the patient compartment.

Recommendations

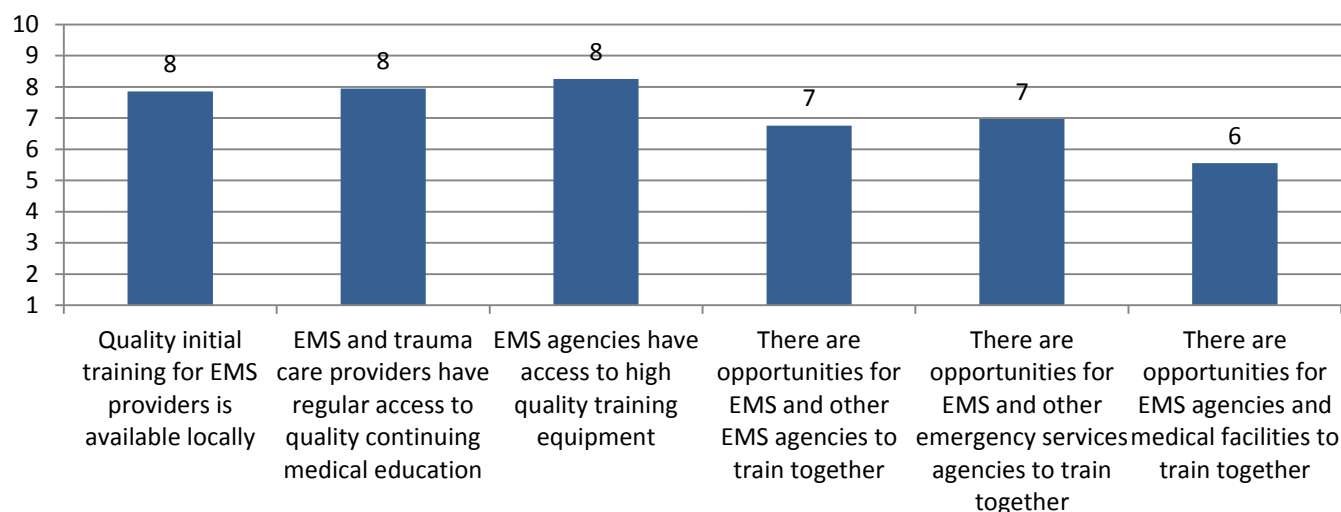
- ✱ Develop a common set of medical treatment protocols for use by all emergency medical response agencies in Grand County. Common medical treatment protocols for all levels of EMS providers at all of the agencies in Grand County are critical to ensure all patients receive high-quality care.
- ✱ Include a local physician representative in EMS medical protocol development to ensure consistency with local medical care standards, compatibility with services available at local medical facilities, and serve as a liaison between the prehospital providers and the local medical community. Physician input from local receiving facilities is essential to create medical treatment protocols that are consistent with medical care standards in the community.
- ✱ Implement early dispatch of air medical for critical patients or patients likely to require a higher level of care. This should include dispatch directly to the scene in circumstances such as motor vehicle crashes with significant mechanism or cardiac chest pain, especially in the less accessible parts of the county. Early dispatch to a facility when patients are identified as having a time-sensitive condition requiring tertiary care such as multi-system trauma patients, STEMI and strokes should be addressed as well.
- ✱ All emergency medical and trauma services organizations in Grand County should use a standard protocol for activation of air medical services and provide consistent training for its application. The activation protocol should clearly identify the agency responsible for making the request and review each activation for appropriate utilization by a multidisciplinary team through a joint quality management process. The regional medical direction program for the Foothills RETAC can provide technical assistance with development of protocols designed for the benefit of patients, based on the circumstances specific to Grand County.
- ✱ Grand County EMS should consider the effects on external agencies when developing procedural changes and communicate with the other provider agencies throughout implementation to avoid disparate expectations between agencies and discontinuity in patient care. Collaborating with the external agencies during the development phase and

including their members in training during implementation yields more effective changes that are less disruptive to other participants in the continuum of patient care.

- ✱ Unrestrained vehicle occupants are at significantly greater risk of injury or death, and pose a risk to other vehicle occupants, in the event of a crash. Grand County EMS should have written policies that require occupants in the cab of any emergency vehicle to be restrained by a seat belt and shoulder harness any time the vehicle is in motion. Further, any patient or other person riding in an emergency vehicle must be properly restrained any time the vehicle is in motion. This includes the use of all cot straps as designed by the manufacturer. Finally, Grand County EMS should develop a culture of safety that emphasizes use of shoulder and seat belt restraints for any provider in the patient care compartment as much as possible. This culture emphasis should include promoting the concept of implementing the vast majority of patient care interventions when the emergency vehicle is stationary, facilitating the use of restraints when the vehicle is in motion.
- ✱ Use of emergency lights and siren should be minimized during scene response and patient transport. The usage rate is already low but may be reduced further for scene responses by EMS medical direction and EMS agency leadership working with the communications center to assign an appropriate response mode configuration to each emergency medical dispatch determinant. Response mode configurations should identify the specific agencies that are needed to effectively manage the incident type and the response mode, emergent or routine, appropriate for each unit. Emergency patient transports can be decreased further through careful review of current practice to ensure lights and sirens are only used for the limited number of patient conditions that would benefit from emergent transport to the hospital. Incorporate dispatch response mode recommendations into the training for providers in all emergency response agencies to reduce unwarranted use of lights or siren. Medical oversight should include dispatch quality management review, compliance with response mode configurations and ongoing evaluation to assess effectiveness of response mode configurations. All response agencies should improve driver training to encourage safe operator behavior and habits, particularly in emergency lights and siren responses.

Education Systems

10 = Strongly Agree 1 = Strongly Disagree
Responded: 52 of 58



Education Systems

As EMS has continued to evolve as a higher-functioning component of the healthcare system, the demand for initial and continuing education has continued to increase. Rural communities have long struggled with all components of EMS education. Significant obstacles include limited budgets, long travel distances and lack of staff coverage to accommodate education. The time and financial commitment to obtain advanced level certification is nearly prohibitive in some rural areas, which also have difficulty attracting and retaining providers currently holding advanced certifications.

EMS education in Grand County suffers to some extent from its rural isolation, but due to a very robust training program at Grand County EMS, quality education is available locally, except for initial paramedic training. To some extent, funding challenges hamper the various agencies, but local education resources mitigate the need to travel out of the county for initial EMT training and both advanced- and basic-life-support refresher training. Although some agencies are state recognized training groups, the primary provider of initial and refresher education is Grand County EMS credentialed as an affiliate of St. Anthony Prehospital Services.

Grand County EMS operates a paramedic advanced life support ambulance service and supports an education division that provides initial, refresher and continuing education classes, as well as a significant amount of community-based education. A full-time captain manages the education program and administers the state-recognized EMS education group. This level of support for the education program is essential to maintain a broad array of required credentials. In addition to an orientation academy, Grand County EMS requires all staff to complete a dozen standard emergency services education classes. Advanced providers are required to complete four additional courses. About half of the required courses must be refreshed every other year to maintain the credential.

Internal education may also be based on quality assurance findings and current research topics in EMS. The medical director provides case reviews and other education when requested but is only familiar with individual clinical performance through the quality management process and training. Information about clinical care issues at transfer of care are communicated primarily via email from the receiving physician and the medical director. This process is characterized by limited communication, which may lead to poor loop closure negatively affecting the accurate identification of educational needs. The education division was recognized as being more robust than most agencies of its size, but it rarely makes use of external resources available through the Foothills RETAC.

Grand County EMS, in conjunction with the St. Anthony Institute for Emergency Medical Services, has conducted an initial EMT training course at both high schools annually since 2006. This training has been a very popular in the community and gives high school students the opportunity to earn class credit while learning a marketable skill. Students use this experience to make decisions about future careers in the health care field, and some have come to work with Grand County EMS and the local fire districts.

With the exception of Grand Lake Fire Protection District, the fire service agencies in Grand County do not require certification as an EMS provider. The common standard for personnel is a current CPR and AED credential although a number of personnel are registered as Emergency Medical Responders (EMRs), as well. Most agencies will support initial EMT training for their members and the local initial training program offered through Grand County EMS is used most often. All of the agencies that support initial EMT training have recognized and addressed the issue of personnel turnover and have policies in place that specify longevity requirements or some kind of graduated reimbursement process. The common CPR certification body is the American Safety and Health Institute and several agencies have a staff member who is a qualified CPR instructor to help the providers maintain this competency.

Given that 75 to 80 percent of the calls for service are for EMS and wait times for an ambulance are longer when a unit is not in the station, EMT certification is the standard at Grand Lake Fire Protection District. The education program offered through Grand County EMS is used for initial EMT training and some continuing education or refresher opportunities. Grand Lake is also a state recognized EMS education group and conducts continuing education in-house.

All of the fire agencies value joint training experiences with Grand County EMS. The amount of time and formal structure of joint trainings varies by agency. These staff interactions are usually regarded as very positive and helpful in preparing and refreshing agency personnel on ways to better perform on EMS calls.

The standard for employment as a patroller with either ski resort in Grand County is Outdoor Emergency Care certification from a program accredited through the National Ski Patrol. Some patrollers also hold EMS provider certification at some level but the agency strictly provides care at the Outdoor Emergency Care level. Neither ski resort provides advanced medical care.

Both ski patrols hold an annual two-day medical refresher at the start of each season, with one day dedicated to medical and trauma training and one day of CPR/AED recertification. The

medical directors are involved in these refresher trainings. Both ski areas hold critical incident debriefings and use a quality management process to identify additional training needs.

All emergency medical and trauma services agencies in Grand County are eligible for training grants through the Colorado Resource for Emergency and Trauma Education (CREATE) program administered by the Colorado Rural Health Center. CREATE accepts applications monthly throughout the year to help fund tuition, required fees, books and travel expenses. Grants require a 50 percent cash match unless the applicant requests a waiver and can demonstrate financial need. These grants have helped agencies across the state of Colorado to train new providers, upgrade skills for existing personnel and maintain credentials to comply with regulatory requirements.

Recommendations

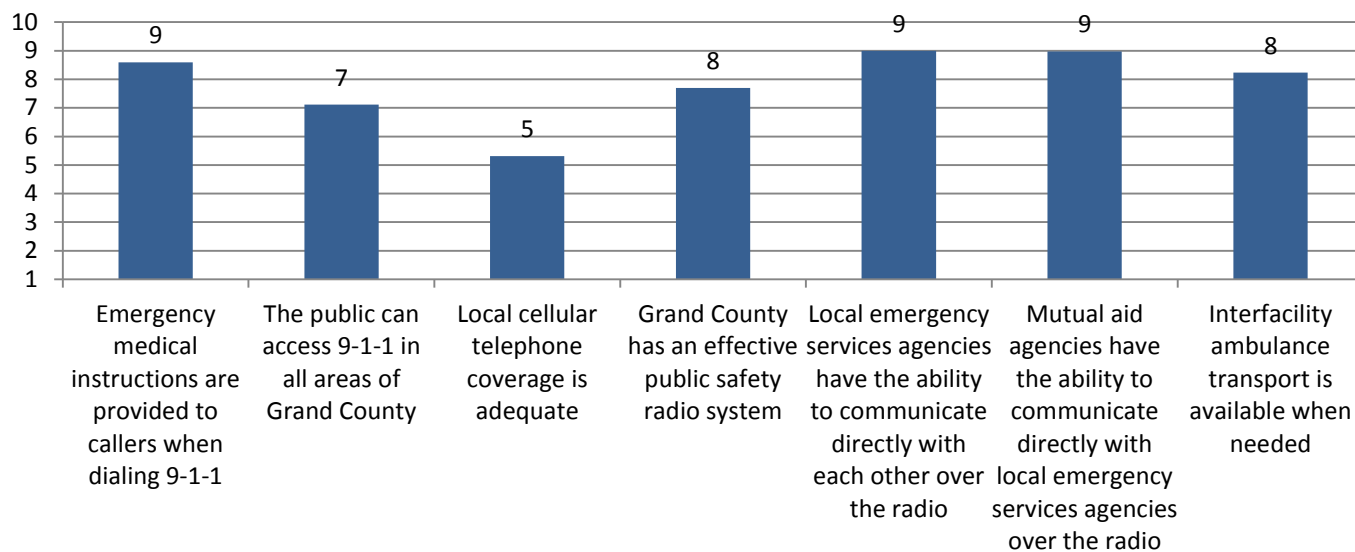
- ✱ Develop a local EMS Education Committee to regularly conduct needs assessments and collaboratively address education challenges. The committee should work to improve coordination of trainings to maximize cost efficiencies, avoid duplication of efforts, and increase communication, trust and agency cooperation and seek grants to assist with funding for initial and continuing education needs. Consider including the Grand County EMS training captain, an EMS medical director, a fire service representative, a ski patrol representative, education coordinators from area hospitals and the Foothills RETAC.
- ✱ Develop relationships and clinical agreements to use emergency department rotations as an educational tool to help familiarize practitioners with current skill levels and identify future continuing education needs, help EMS personnel gain experience in vital competencies such as patient assessments and venous access.
- ✱ Engage air medical services as part of the overall EMS education program. Personnel from the full range of emergency medical and trauma services organizations should undergo the helicopter safety training and periodically refresh this education. These agencies have offered to participate as much as possible and have outreach education budgets to be a helpful education resource.
- ✱ Pediatric hospitals, trauma key resource facilities, comprehensive stroke centers and other specialty services include outreach education as an integral part of their mission. Involve these resources in the overall EMS education program. Exposure to instructors from other EMS outreach programs helps to avoid an insular internal education system.
- ✱ Re-establish efforts to communicate continuing education and skills training opportunities to prehospital providers and medical facility staff. Open enrollment for courses appropriate for the needs of prehospital and medical facility staff to providers from both disciplines jointly plan these educational opportunities. This is an excellent way for the staff members from multiple organizations to come together with a joint objective. Foothills RETAC can be a resource for these programs.
- ✱ Consider using online educational offerings. High quality online continuing education can be found through hospital system outreach programs, as well as contracted through several national providers and can fill gaps in areas where essential continuing education is not available locally.
- ✱ Continue to develop the use of high-fidelity EMS training mannequins for in-house education. These have had good early scientific support for the maintenance of clinical

skills in the absence of patient contact volume and can often be acquired with the assistance of grant funding. Additionally, positive outcomes are also being shown with reality-based training scenarios, which can also be a great method to engage multiple agencies in real-time exercises. Educational content that makes use of high-fidelity EMS training mannequins can be accessed through state-recognized EMS education programs operated by the air medical services and hospitals on the Front Range. There are also two mobile pediatric simulation labs based in the Denver metropolitan area that can bring this resource to Grand County for a modest fee.

- ✿ Link continuing education programs to the quality management process. The existing continuing education processes appear to cover the requirements to maintain credentials but connecting the two processes will advance the agencies to the next level where education can reinforce existing strengths and bolster identified weaknesses in the system as well as for individual providers. This is particularly important for advanced-level providers who may be performing higher-level skills infrequently based on the relatively low volume of patient contacts.
- ✿ Take advantage of industry-specific leadership and management training for the ambulance service supervisory and management staff. The ambulance service directors are experienced and, from all appearances, they have performed well. However, it is important that they each receive the necessary tools to guide and help with the multitude of issues that even experienced ambulance service managers face. Initially consider course offerings like the National Fire Academy-Management of Emergency Medical Services, American Ambulance Association-Ambulance Service Management, Northwest RETAC EMS Leadership Conference and the National Rural EMS Conference and provide funding, travel, backfill or other support necessary for the director to attend.
- ✿ Review scheduled emergency medical and trauma services education and evaluate opportunities for funding assistance. Make use of resources from the Colorado Rural Health Center and Foothills RETAC to help identify grants and scholarships available to providers serving Grand County.

Public Access and Communications Systems

10 = Strongly Agree 1 = Strongly Disagree
Responded: 52 of 58



Public Access

The Grand County Sheriff's Office Communications Center is the designated public safety answering point for the county. Enhanced 911 service is available and the communications center can receive automatic number identification and automatic location identification information from all telephones in the county connected to the wired telephone network. Respectable wireless telephone service is available in much of the county with notable exceptions in large areas across the north and west part of the county. Dead zones without service are scattered across the county and vary by mobile telephone carrier. Union Wireless, a regional wireless carrier, covers the area reasonably well as does Verizon. Union also maintains agreements with AT&T and T-Mobile to both provide coverage to those carriers within their service area and allow Union customers to roam on those networks when traveling outside the area. Phase I Wireless Enhanced 911 service, with name, telephone number and location of the cellular tower connected to the caller, is available for all wireless calls. The communications center has the capability to use Phase II Wireless Enhanced 911 service if the mobile telephone carrier can provide latitude and longitude coordinates for the caller. Text to 911 has been available in Grand County since 2017. The county uses the Code Red emergency notification system to send messages to telephones connected to the wired network and wireless telephones registered with the system.

The ski resorts have created their own emergency notification system for incidents on the mountain. Each resort has a network of call boxes dispersed along the slopes connected to a dispatch centers that is staffed during operating hours to receive emergency notifications.

The public's reliance on wireless telephone service for all needs leads many to have too much confidence in the ability to contact 911. This problem is most noticeable in backcountry areas

of Grand County but is especially evident in Rocky Mountain National Park. Overconfidence in the capabilities of wireless telephones has resulted in some members of the public venturing into the backcountry without appropriate preparation. GPS-enabled tracking devices are another piece of technology affecting response agencies. Leaving the device turned on after returning to the trailhead or other incorrect usage has caused an increase in false reports from concerned family members.

Communications Systems

Typical of rural counties throughout Colorado, the communications center is operated by the Sheriff's Office. The dispatch center is located in Hot Sulphur Springs. The dispatch center serves all Grand County public safety agencies including the Sheriff's Office, three municipal police departments, five fire protection districts, Grand County EMS, search and rescue, the county coroner and the National Park Service for joint emergency operations.

The public safety radio system in Grand County utilizes the statewide digital trunked radio (DTR) system for emergency communications and responder notification. Seven tower sites throughout the county access the statewide DTR system with a VHF radio system providing backup coverage. The VHF system is hampered by having only two towers to cover the county. The VHF system is used for paging all EMS and fire agencies but reliability has become more sporadic as it ages. The county is evaluating pagers that operate on the statewide DTR system and may migrate to that system for responder notification if they prove to be effective.

There are concerns the county communications system is not as responsive to Rocky Mountain National Park as it should be. Notification to the park appears to be delayed on emergency calls that are routed to the Grand County communications center. The park's VHF radio system is not used consistently by Grand County EMS units responding to incidents in the park.

The response agencies have confidence in the performance of the communications center staff. There is consensus that implementation of the DTR system greatly increased reliability and coverage. The lack of upgrades to the back-up VHF system is a concern. The VHF system is essential for notifying responders. Search and Rescue and Rocky Mountain National Park are primarily VHF dependent. The fire districts rely on volunteer staffing and must have a reliable VHF paging system to notify responders.

There are no established radio system user protocols or procedures. The dispatcher assigns responders to a specific operations channel for all incidents. Agencies responding to medical emergencies expressed concerns that Grand County EMS is not always readily available on the assigned operations channel because the ambulance is using the EMS tactical channel to talk with other EMS units and supervisors. Use of the EMS tactical channel by the ambulance during a response does not integrate with the incident command system and is considered an impediment to response coordination. At times it has caused confusion. For example, an ambulance responding to a call contacted the EMS supervisor on the tactical channel to request an air medical unit. The EMS supervisor contacted the air medical service but did not notify the communications center that an air medical unit had already been requested. Incident command had also requested an air medical unit and the dispatcher wound up duplicating what the EMS supervisor had already done. In addition, the lack of direct

communications does not permit the communications center fulfill its obligation to monitor the status of response units and provide updated information from reporting parties. The overuse of the EMS tactical channel is affecting interagency relations.

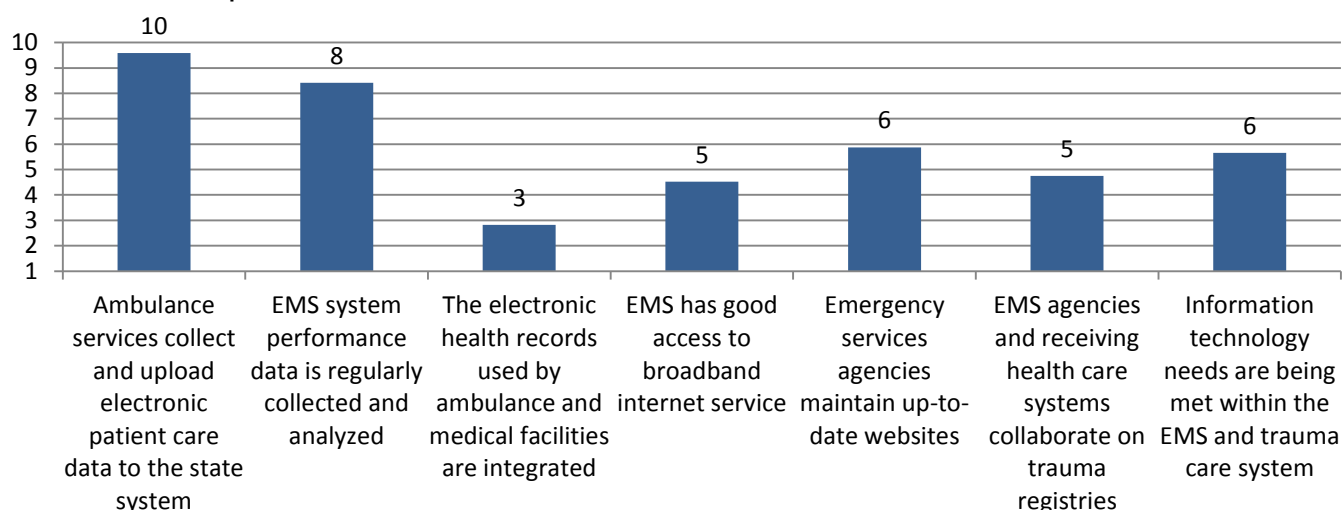
Considering the recent award of the nationwide FirstNet public safety mobile network contract to AT&T and Colorado's decision to participate in the system in December of 2017, it is likely that AT&T service with the corresponding public safety priority and preemption components will become available to Grand County public safety providers and local hospitals. It is also expected that Verizon, and potentially other carriers, will also offer competitive public safety services with similar priority and preemption capability. Over time it is also likely that these services will replace the DTRS system for push-to-talk radio applications.

Recommendations

- ✱ Collaborate with Rocky Mountain National Park to develop and implement a public information campaign utilizing local media, resort information television, trailhead signage and web-based media to educate the public about the shortcomings of wireless telephone service to access 911 in remote locations and throughout the park. This message has widespread applicability and may benefit from collaboration with provider agencies on both sides of the Continental Divide.
- ✱ Develop and implement a public information campaign utilizing local media, resort information television and web-based media to educate the public about the Code Red emergency notification system and how to register a telephone to receive notifications.
- ✱ The Board of County Commissioners should seek funding opportunities to enhance reliability of the county VHF system to support paging and ensure resilient public safety communications capabilities.
- ✱ Collaborate with user agencies to develop and implement a process to create county-wide dispatch standard operating procedures to improve system efficiency, assist the dispatchers in the performance of their duties, ensure all responders use the system in a unified method and enhance responder safety. For example, about 30 percent of the Grand County EMS call volume involves transports to tertiary care and specialty centers on the Front Range. Using the statewide DTR system, the Grand County Communications Center now has the capability to conduct regular status checks for the Grand County EMS crews during transports outside the county.
- ✱ Grand County EMS must completely integrate into the county communications system. The use of the dedicated EMS tactical channel should be limited to essential, non-emergency communications. Prehospital requests for air medical resources must be accessed through the Grand County Communications Center to minimize potential confusion, reduce duplication and to enhance responder safety. The primary goal is to ensure all agencies involved in an emergency response are aware of important communication in real-time.
- ✱ Stakeholders should keep abreast with development of the FirstNet public safety mobile network and trial new devices or services as they become available to determine if they enhance communications capabilities.

Information Systems

10 = Strongly Agree 1 = Strongly Disagree
Responded 50 of 58



Information Systems

Grand County EMS is using current technology for patient care reporting and data collection. Each ambulance is equipped with a mobile wireless broadband router and an encrypted laptop running the web-based electronic patient care reporting system from ESO Solutions. If an adequate signal is present, field personnel can use all program features when completing a patient care report and the record is automatically stored in the cloud. If an adequate signal is not present, field personnel can enter the patient care report and store it locally on the encrypted laptop. Some program features such as autofill of demographic information for previously seen patients are not available. Data stored on the encrypted laptop is automatically uploaded to the cloud when an adequate signal is available. About 85 percent of the county is covered with reliable broadband connectivity. Grand County EMS is current on patient care submissions to the Colorado Department of Public Health and Environment. Presently, billing information is managed through a third-party billing software package. Data transfer between the patient care reporting system and the billing software is managed through an intermediate program. Grand County EMS is planning to move toward the ESO billing package to directly connect the patient care reporting system and the billing system to streamline the billing process.

The regular receiving facilities do not have direct access to prehospital patient care reports in the ESO system for the purposes of obtaining patient records or quality assurance data. Grand County EMS automatically provides a copy of the patient care report to the receiving facility for all trauma patients but any other request for patient care data must be handled on a case by case basis upon request. Grand County EMS is able to upload the patient care information from ESO into the EPIC electronic health record used by the local hospitals through an intermediate user program.

Communications between EMS personnel in the field and physicians providing on-line medical direction typically are accomplished by wireless telephone or on the channel assigned to the facility on the public safety radio system. These communications are not currently recorded and there is no capability to review these conversations for quality management or compliance purposes. The communications center is addressing the issue and expects to have the ability to record these conversations by the end 2018.

Mobile data terminals (MDTs) are a valuable tool that allows response personnel to receive important call information like agency unit status, incident number, pertinent medical information, previous history of 911 requests and reported hazards at the address and call times. MDTs also have the capability to message the crew with critical private information, map incident locations and optimize routes to minimize driving time. Grand County EMS does not currently use MDTs in the ambulances, primarily due to cost and the inability to support the technology. The Sheriff's Office recently began using MDTs based on an iPad platform. If these device demonstrate their effectiveness and reliability, Grand County EMS may be able to implement basic MDT technology in its response vehicles. Grant programs through the Department of Homeland Security, Federal Emergency Management Agency and Colorado Department of Public Health and Environment may be able to provide funding assistance to implement this technology for eligible organizations.

All of the emergency medical and trauma services agencies in Grand County have current web pages that are easy to navigate and provide a variety of useful information. Grand County EMS maintains a page on the Grand County website with about two dozen subsidiary pages and links to other resources. The site includes a mix of content typically found on sites for public safety agencies, medical facilities and local governments. Both medical facilities have robust websites that include content similar to that found on the sites for similar facilities across the state. The sites offer a broad array of information about the organization, locations, providers, patient records, billing and employment opportunities. The emergency medical and trauma services agencies appear to have managed their web presence well that serves as a quality method for outreach and communication with constituents.

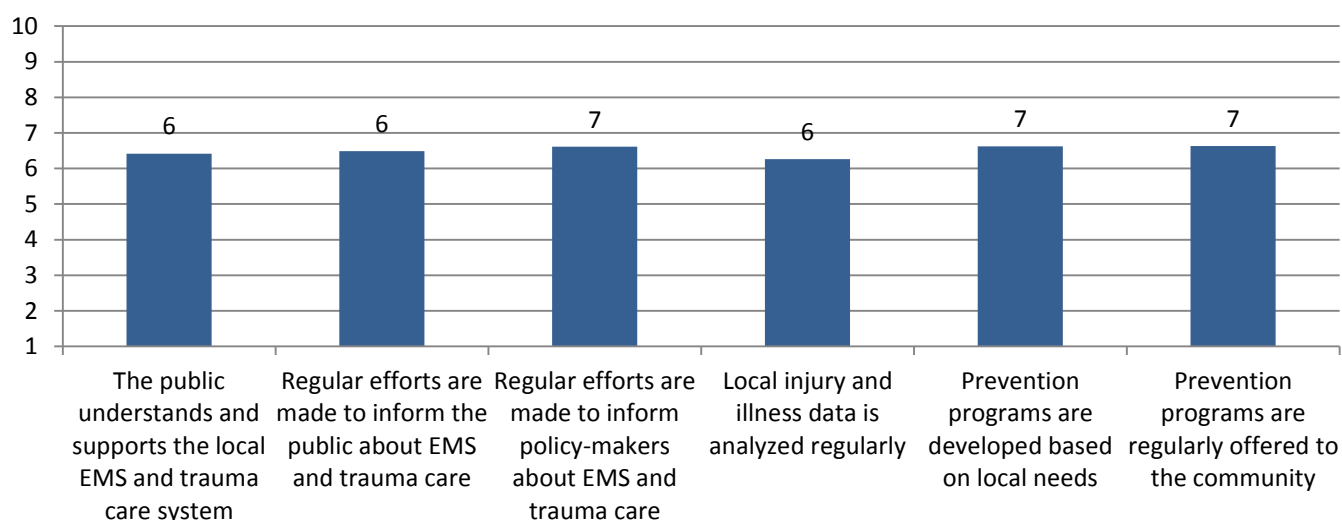
Recommendations

- ✱ Implement the capability to record communications between EMS providers in the field and on-line medical direction. This information is important for quality management and compliance activities. It can also be invaluable for after-action reports.
- ✱ Implement MDTs for Grand County EMS to enhance communications between the communications center and response units in the field once the technology requirements and connectivity needs can be supported. Mapping and vehicle location capabilities can improve response, situational awareness and overall responder safety. Continue to explore the available options as technology continues to improve and expand capabilities.
- ✱ Implement the billing program with direct connection to the patient care reporting system at Grand County EMS. Improved capability to process billing information in an accurate and timely manner will increase personnel efficiency and help to maintain the current, impressive collection rates.

- Implement a connectivity hub to link the Grand County EMS patient care report system with the electronic health record systems at the regular receiving facilities. Real time access to prehospital patient care data will enhance continuity of care and reduce the amount of time Grand County EMS administrative personnel have to spend responding to requests for this information.
- As more emergency medical and trauma services organizations implement electronic record systems, consider establishing links between the systems to share data across the spectrum of patient care to monitor the quality of care for individual patients or combine to assess any aspect of system performance, and reduce duplicative data entry.

Public Education and Prevention

10 = Strongly Agree 1 = Strongly Disagree
Responded: 50 of 58



Public Education

Unless emergency medical and trauma services systems make public education a priority, the general public will continue to have a very limited understanding of its functions. Providers frequently expect the public to know when, and when not, to use services, how to provide basic care before EMS arrival and the reasons programs routinely have funding challenges. Progressive systems not only provide fast, appropriate and high quality care, they also enable their constituents to be a stronger part of the emergency medical and trauma services community through innovative public education initiatives. Public education often overlaps positively with prevention activities, as well, providing additional opportunities to be a more active community partner.

Numerous public education programs have been successful in Grand County. EMS, fire services and the medical facilities all participate in various community events involving educating the public about their programs. Community CPR/AED and first aid classes are held regularly at Grand County EMS, and some fire agencies have CPR instructors, as well.

One of the most successful community-based educational programs has been the initial EMT class offered through the high schools. Grand County EMS established a relationship with Middle Park and West Grand High Schools in 2006 to offer initial EMT classes as an elective course. Seniors from both high schools attend EMT class for an hour a day for the entire school year. Upon successful completion of the course, students may sit for the NREMT exam to become nationally registered as an EMT. Grand County EMS also offer a one semester internship program for juniors and seniors from both high schools. Between these two programs, Grand County EMS is able to help students gain valuable information, learn vital skills and perhaps help them decide to continue with a career in EMS, health care or public safety. Several students have been hired to work for Grand County EMS after completing one of these programs.

Grand County EMS also conducts numerous ambulance and station tours for community members, generally children, and has a presence at other community-based health and safety events throughout the year. Similarly, each of the fire agencies use both paid and volunteer personnel to staff various events with opportunities to interact with members of the community. Kid's safety days, 9 Health Fairs and Passport to Health are examples of such events.

Standby events are also opportunities for EMS and other public safety to be present and interact with the public while being ready for an emergency. Not only are these good public relations activities, but members of the public can become better informed about the emergency medical and trauma services system, how it works, and when to call. In Grand County most agencies are already very active in these events.

Middle Park Medical Center is in its second year holding an annual health fair each spring in Kremmling. Discounted health and wellness blood screenings are offered as part of the event. Other screenings available include blood pressure, pulse oximetry, height and weight, diabetes risk management and nutrition, skin checks, stress management, cardiac risk assessment, fall prevention, vision screening. A variety of other local agencies are also available to share information at booths during the event. Grand County EMS, Grand County Public Health, Kremmling Fire Department, Kremmling Police Department, Victims' Advocates, Pregnancy Resource Center, were all invited to participate this year.

Middle Park Medical Center also offers community presentations about a variety of health and wellness topics presented by physicians and other specialty providers.

Prevention

As an integral part of the healthcare system, emergency medical and trauma systems have a responsibility to engage in community prevention activities. Moreover, the public often responds very positively to initiatives by hospitals and first responder organizations. Not only do prevention activities provide proven opportunities to reduce human morbidity and mortality, it is another chance to interact with the members of the public in a positive setting. In most cases, prevention intersects well with public education efforts and collaborative efforts in both programs bring the additional benefit of building interagency relationships.

Although most Grand County emergency medical and trauma system stakeholders are currently involved in some prevention activities, there is currently no multi-agency countywide plan, and only limited collaborative efforts in prevention activities. Barriers to more comprehensive programs include personnel time and funding, as well as an environment of strained cooperation between some stakeholders.

Some highlights of current prevention activities include:

- EMS, law enforcement and the medical facilities collaborated on the Grand County Clicks occupant protection program.
- Grand County EMS participates in immunization points of dispensing and numerous other public health exercises.
- 9 Health Fairs in Grand County have regular participation from multiple agencies.
- All of the fire districts participate in various community safety presentations, including child safety for daycare and grade schools, plus at least one annual school safety day.
- Grand County EMS participation with a DUI prevention program at Middle Park High School and West Grand High School.
- The East Grand Medical Center trauma coordinator serves as the chair of the Foothills RETAC Injury Prevention Committee.

Most sudden cardiac arrests result from ventricular fibrillation. This is a rapid, unsynchronized heart rhythm resulting in little or no cardiac output. The heart must be defibrillated quickly, since research has shown the chance of surviving drops by 7 to 10 percent for every minute a normal heartbeat is not restored. Quality CPR may help prolong a victim's chance of survival, but actual resuscitation requires the restoration of an organized heart rhythm and effective pumping action accomplished only with a defibrillator. An automated external defibrillator (AED) is a lightweight, portable device that delivers an electric shock through the chest to the heart. AEDs automatically assess the victim's heart rhythm and determine whether defibrillation is needed, thus can be used safely, appropriately and effectively by even non-medical people. In fact, AED training is now a mandatory component of CPR certification. The Community AED Outreach program, managed by Grand County EMS, is a robust, highly regarded program in the county. Grand County EMS has found funding through various sources to place AEDs throughout the community, and continues to seek funds to increase the number AEDs deployed through the program. Additionally, on-duty Grand County EMS personnel conduct monthly maintenance checks on the devices. Grand County EMS also hosts numerous CPR/AED certification classes for its staff, public safety personnel and members of the community. Ski patrols at both resorts and many fire apparatus throughout Grand County are

equipped with AEDs as part of this program. Although a public alert system has not been implemented yet, numerous community locations have public access AEDs.

Injuries suffered in a motor vehicle traffic collisions are the leading cause of death among children in the United States. Numerous studies including a 2010 NHTSA Study Children Injured in Motor Vehicle Traffic Crashes conclude that use of child safety seats is effective. Presently Grand County EMS and Grand Fire Protection District are registered with the Colorado Department of Transportation as locations for certified car seat inspections and installation assistance. Attrition may account for fewer certified car seat technicians currently. Other options could reasonably exist with some agency commitment to this vital prevention program.

Recommendations

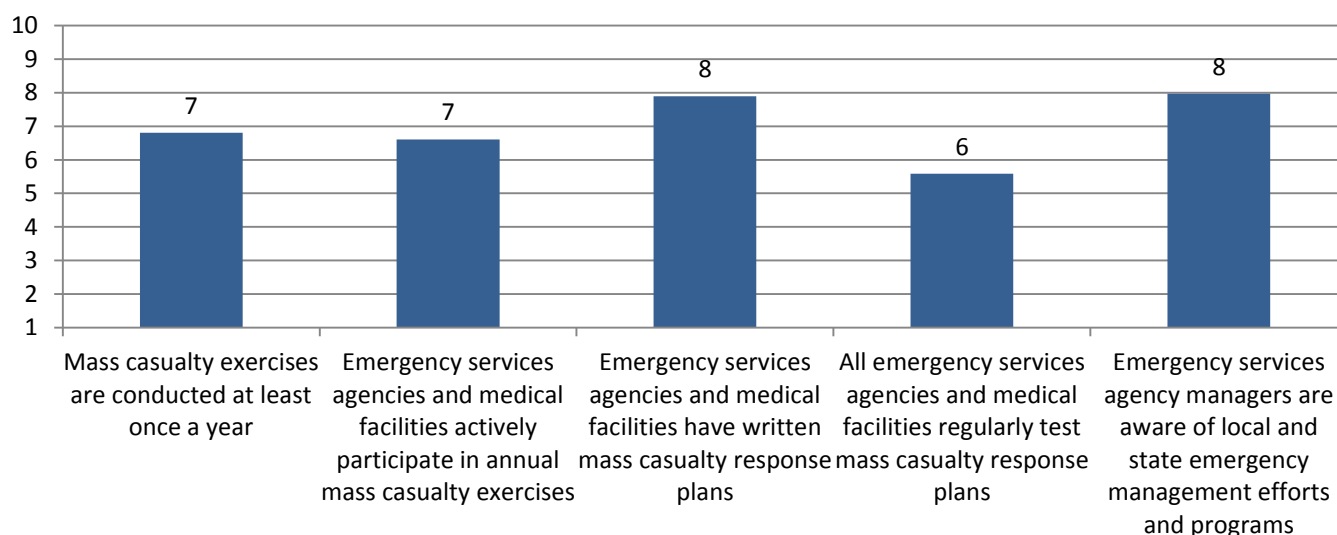
- ✱ Acknowledge public education as a critical activity. All emergency medical and trauma services stakeholders should collaborate with other community resources to determine needs and explore methods to fund and implement public education initiatives. Work collaboratively with the Foothills RETAC to develop a solid community-wide public education plan that includes clinical education, program marketing, system access awareness and prevention and considers the needs of all members of the community including school-age children, adults, senior citizens, and other members of the community with special needs.
- ✱ Create a public education coordinator position at Grand County EMS with clear performance expectations. Consider combining the position with prevention activities. Consider coordinators at all stakeholder agencies, as well.
- ✱ Continue building on the community's knowledge about the EMS system and engage in continuous efforts to educate the public.
- ✱ Continue to promote at least the following clinical skills:
 - Community CPR, AED and basic first aid training
 - CPR, AED and basic first aid for school employees, coaches and law enforcement
 - Early CPR, AED and basic first aid for high school students
- ✱ Consider annual activities during National EMS Week and National Emergency Nurses Week to recognize personnel and share their vital role with the community. Explore access to funding from the Foothills RETAC to assist in the activities.
- ✱ Continue to be active in special event standby activities. Educate staff on how to make these events an opportunity for positive interaction with the public.
- ✱ Routinely evaluate the effectiveness of the public education program and identify new opportunities.
- ✱ Make a commitment to engage in community-wide, multi-disciplinary illness and injury prevention activities. Prevention should be recognized as not only a method to improve the health and safety of the community, but as an avenue to connect with the community in a mutually beneficial manner.
- ✱ Engage the Foothills RETAC Injury Prevention Committee, Grand County Public Health or other sources to conduct a community needs assessment. Use surveys, trauma incidence data from the medical facilities and other sources to identify problems or areas of interest to the community. Collaborate with designated trauma centers, EMS, fire services, public

health, schools and other stakeholders to develop a specific, achievable prevention plan to address identified community needs.

- ✱ Consider increasing the number of car seat technicians in Grand County. Engage medical facilities, EMS, fire services, law enforcement and public health to commit more staff training to this program.
- ✱ Continue the excellent work building a heart-safe community:
 - Seek additional funding to place more AEDs and develop a method to identify target locations.
 - Engage the communications center on AED locating procedures, or use an automated program, during reported sudden cardiac arrest events to assure nearby AEDs are brought to a sudden cardiac arrest as quickly as possible.
 - Commit to training more community members in CPR and AED use, and develop a multi-agency approach to holding classes for the community.
 - Assist businesses and other community AED sites to have emergency response plans and targeted users.
 - Conduct public awareness campaigns on heart attack recognition, early access, and community AED program information.
- ✱ Consider exploring the use of multiple social media platforms. Each platform (twitter, Instagram, snap-chat, Pinterest, etc.) opens the user up to different audiences with differing interests and perspectives. Do not be discouraged if there is limited interaction initially. Even if people are not specifically interacting, pressing icons and commenting on posts, that does not mean they are not looking at the content and receiving the messages. Social media is a great avenue for education and outreach to constituents of all ages, interests and backgrounds.

Mass Casualty

10 = Strongly Agree 1 = Strongly Disagree
Responded: 50 of 58



Mass Casualty

The Grand County Office of Emergency Management has the lead role in planning for all hazards, including mass casualty incidents. The county emergency manager is responsible for updates and maintenance of the county emergency operations plan and the annex that addresses mass casualty incidents. The emergency manager also chairs the local emergency planning committee meetings and seems to have an open dialogue with emergency services stakeholders.

There were some concerns about county emergency management being positioned within EMS rather than being run as a separate department of the county. There was uncertainty about the overall roles and responsibilities assigned to the emergency manager and the perception that EMS leadership responsibilities detract from the focus on emergency management. The organizational structure also appears to be systemically biased in favor of EMS and some stakeholders expressed that their concerns about the management of the program were not being heard or taken seriously by Grand County EMS leadership and other county officials.

Grand County has a mass casualty plan that was developed independently over time by evaluating procedures documented by other organizations, including the mass casualty plan crafted by Foothills RETAC and through lessons learned by local emergency service agencies. The Grand County mass casualty plan does not specifically articulate with the mass casualty plan for the Foothills RETAC. The emergency services community acknowledges the existence of a mass casualty plan but admit that it has been at many years since they have participated in a drill that included all agencies. In order for agencies to establish collaboration needed to be effective at managing extraordinary situations, it is important to practice and drill together. Drills also give individual field providers and command staff the opportunity to practice the incident command system experience emergency situations that are beyond what occurs on a routine basis. Many stakeholders described trainings held within individual agencies that would fall under the category of a mass casualty incident, including active shooter scenarios and other examples of targeted hybrid violence, but did not include other organizations.

A concern was raised that, when interagency training or exercises do occur, Grand County EMS does not always fully participate. It was unclear if this was seen as a lack of interest or lack of resources to dedicate staff to participate. Regardless, exercises are generally planned well in advance and give the opportunity to schedule the necessary resources to participate without reducing the staff available to respond to routine calls.

Grand County EMS maintains a mass casualty incident trailer that includes approximately 20-30 traditional long back boards with an additional 40 cardboard backboards for patient movement. A full complement of color coded, position specific vests, color coded tarps for use at a casualty collection point and a series of “go-bags” outfitted with simple patient care supplies for each segment of the casualty collection point, including manifolds to provide mass oxygen administration. There is a plan in place to transport the trailer to the scene of an incident upon request. Grand County EMS is currently making plans to add a cache of tourniquets to the “go-bags” within the trailer. Grand County EMS also supplies each

ambulance with a belt outfitted with color-coded surveyor tape for the purposes of initial triage by first arriving crews.

Local law enforcement stakeholders were quick to point out that Grand County EMS has invested considerable effort to train law enforcement officers in tactical bleeding control procedures and provided tourniquets and other basic bleeding control materials for officers to carry. Grand County EMS is also working with the school district to provide training on bleeding control and is building a plan to provide simple tourniquets and other materials in the event of targeted hybrid violence in a school. Grand County EMS personnel that are qualified for tactical EMS response have ballistic carriers and helmets available to them (6-8 sets) and have done preliminary training with law enforcement on active shooter concepts.

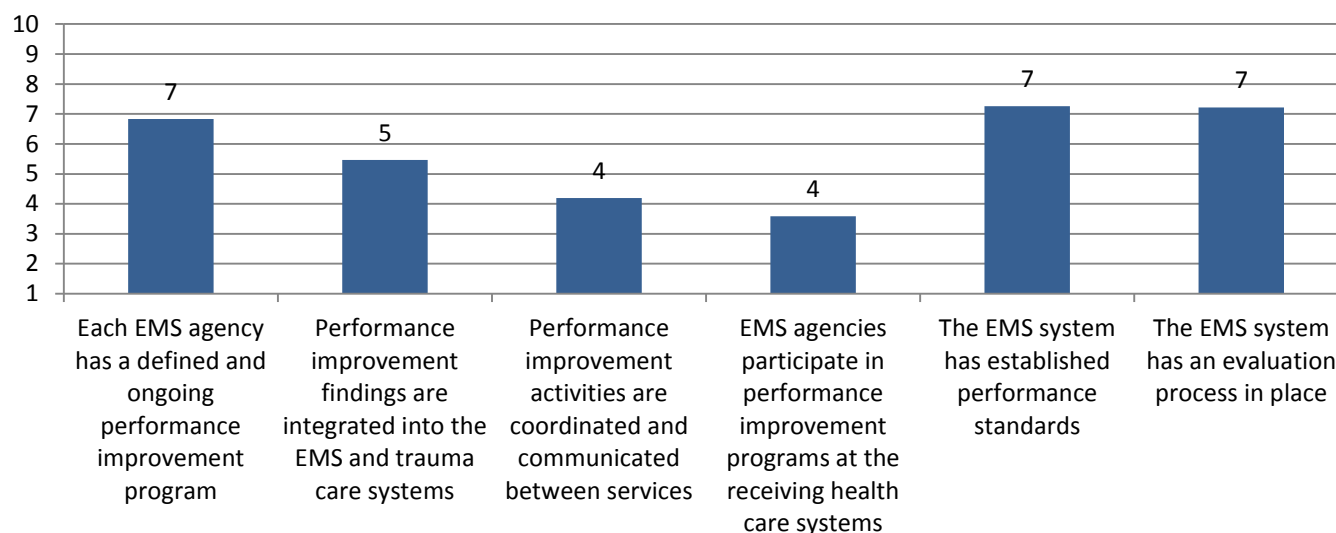
While it is prudent to plan for large scale disasters that involve many injured or ill people, a mass casualty incident is defined simply an event that has the potential to overwhelm initially available resources. Understanding that Grand County EMS covers a large geographical area and may only have three ambulances in service at any one time, an incident with as few as five patients qualifies as a mass casualty incident.

Recommendations

- ✱ The emergency manager should meet with each co-responding stakeholder to address the concerns expressed about the emergency management organizational structure and set a foundation for collaboration and mutual respect moving forward.
- ✱ Conduct a table-top exercise in the next 6-8 months that would include all relevant stakeholders and outline key elements of the mass casualty plan. Over the next 12-24 months, consider a series of table-top exercises that gradually increase in size and complexity. Once stakeholders have reached a comfort level with their particular roles and responsibilities along with executing common elements of mass casualty management, consider developing a county-wide exercise that will test the concepts covered in the table-top exercises.
- ✱ Middle Park Medical Center and Grand County EMS should plan resource allocation and earmark staff time to fully participate in planned incident drills with other agencies.
- ✱ Develop and train on a reliable methodology for patient tracking. Although there are commercially developed programs that utilize computers, code scanners and other digital technology, the quickest, cheapest and proven processes involve pencil and paper.
- ✱ It is becoming increasingly common that emergency responders of all disciplines are becoming the target of unprovoked violence. Issuing tourniquets to all EMS personnel to be worn as part of their uniform is a relatively inexpensive measure to improve personal safety in the event that they or their partner are caught up in circumstances in which they are injured before having the opportunity to seek cover or escape.
- ✱ As soon as is reasonable, be sure that all stakeholders understand and agree upon their roles will be in the event of active shooter incidents within Grand County. Remove all assumptions and work to provide position-specific training that fits within a targeted hybrid violence subsection of the county mass casualty plan. This topic is worthy of separate training aside from standard mass casualty planning.

Evaluation

10 = Strongly Agree 1 = Strongly Disagree
Responded 50 of 58



Evaluation

Evaluation is a key process that assesses the quality of a system. Without evaluation there is no way to determine if the emergency medical and trauma services system in Grand County is achieving its goals. Many systems develop some form of evaluation to gauge the performance level of the agencies in comparison to the expected level of service. A good evaluation system can be compared to a dashboard in a car: one can easily look at it and tell what is going on. Modifications can then be made, steering the system towards its goal. Having an effective evaluation system in place also facilitates resource allocation to determine if there are adequate numbers of resources or if a particular resource needs to be added or decreased.

Grand County EMS has an extensive program to evaluate the quality of patient care. An EMS captain is responsible for reviewing 100 percent of the patient care reports. Additional filters are instituted to assess protocol compliance and patient outcomes. Specialized review criteria are added periodically to scrutinize a specific issue. All air medical transports and rapid sequence intubations are reviewed. Dr. Nichols personally reviews all patient field refusals and releases, deaths on scene, all incidents requiring waived interventions and other patient care reports as determined through the quality management process. Grand County EMS also developed algorithm cards that crews are required to utilize for complicated interventions and procedures. Rapid sequence intubations require two paramedics from Grand County EMS on scene attending the patient before initiating the procedure after performance issues were identified through the quality management process. The quality management program is reasonably complete but difficulties with loop closure exist, especially with cases involving outside organizations. The evaluation process is hampered to some extent by the difficulty of acquiring a discharge diagnosis or other definitive information on patient outcome, particularly from tertiary care centers and medical facilities outside Grand County.

Development of formal quality management tools and coordination between the various quality management processes in place at each organization would permit comprehensive analysis of the emergency medical and trauma services system as a whole. In addition, the Colorado legislature recently extended protections to exclude EMS quality management activities from being legally discoverable and offer immunity from civil lawsuit for quality management participants, providing the activities meet a minimum set of quality management standards and participants act in good faith. The elements specified in the statute are taken from quality assurance and quality improvement programs used by hospitals and other health care entities and put this component of the health care system on an equal footing. Implementing the guidelines may help Grand County to enhance current quality improvement programs through a multidisciplinary approach across the full spectrum of patient care.

Data plays a crucial role in evaluation of emergency medical and trauma services systems. Rural systems are often plagued by the perception that datasets with a small number or numbers are not statistically significant. Even statistically insignificant data has value. If an agency ignores data one may miss an opportunity to evaluate procedures whether frequent or infrequent. The second concept missed with this thinking is that the data maybe small and statistically insignificant yet when combined with other system's data on a regional, state, national or international scale it becomes significant and powerful. Data from Grand County is relevant to determine if the services available in the community make a difference and whether any improvements to provide the highest level of patient care and satisfaction can be made.

During the stakeholder interviews, there were some concerns expressed that ambulance response times had deteriorated in some parts of the county. Traditionally response times have been a primary metric for EMS to measure how effectively a service is delivering patient care. Response times are easily measured and broadly understood. While response times are a component of patient care delivery, they are not the only part that should be evaluated. The relationship between response times and quality outcomes is complex. Most response time criteria are based on various studies that measured neurological intactness after return of spontaneous circulation in cardiac arrest patients.

Looking at Grand County as a whole, it is a difficult task to develop meaningful response time criteria given the vast differences in population density, call volume and road access across the county. Response times performance should be a general guideline based upon national industry standards, compare reasonably with existing county response time data. Responses in remote areas that are difficult to access and mutual aid responses out of the county should not be factored into the response time analysis. Safety considerations should also be made for inclement weather periods and crews should not justify increasing speed or taking risks to meet an arbitrary response time goal. It is also important to note that the overall response time should be evaluated based upon the dispatch time to the on scene time for responding units to properly demonstrate how long it takes for crews to arrive on scene once dispatched. Another consideration in evaluating response times is separating out emergent versus non-emergent responses. Higher priority requests for service should have a different response time goal from low acuity requests. For example higher acuity responses requiring an emergent response might be 8 or 9 minutes where a non-emergent low acuity response might be 15-

minutes for a more populated areas compared to a 15-minute emergent rural response goal with a 20-minute non-emergent response goal. Performance standards are a challenge in rural communities; however, steps can be taken to evaluate the response effectiveness. Establishing reasonable response goals for the various response areas should be considered and evaluated on an annual basis to demonstrate the effectiveness of the services they provide to the community.

Recommendations

- ✱ Develop defined processes for EMS chart review to include clinical filters and a standardized approach to help identify and address gaps in provider knowledge or skills. Create mechanisms to demonstrate that appropriate training, remediation or other corrective action has been taken when issues are identified in the quality management process. Perform mandatory quality reviews of STEMI, stroke, sepsis and critical trauma patients.
- ✱ Consider development of a county quality management group to provide a forum for protected case review, provider feedback and loop closure of system or clinical care issues. Collaborate with all agencies and organizations involved in a case to review the patient care reports for proper assessment, treatment and transport from the 911 call through final patient disposition.
- ✱ Grand County EMS should resurrect the internal quality management committee that included participation from the field providers. The field staff recognize the importance of a vibrant quality management process and want to participate. When this committee was in place, the staff felt supported and not threatened by the process. Quality reviews focused more on improvement and education rather than being punitive, and feedback was communicated in a timely manner.
- ✱ Identify system performance measures for periodic review and use available data to conduct an evidence-based evaluation. For example, several stakeholders expressed concerns that ambulance scene times were too long on calls where advanced airway procedures were performed. An analysis of scene time data will identify if the time interval is actually too long, further investigation can determine the cause and any corrections can be addressed through training or process changes.
- ✱ Review agency quality management programs to ensure they reflect the most current research, best practices and thoroughly assess system and individual performance. Update all prehospital quality management programs to incorporate the components required to invoke the protections enacted by the Colorado legislature in 2014 to place them on equal footing with the quality management programs used by other health care providers.
- ✱ Participate in the regional coordinating group for EMS medical directors and agency clinical coordinators to formalize evaluation techniques at a regional level. This group can also evaluate regional protocols based on best practices from rural EMS medicine.
- ✱ Create a reliable, efficient system to provide a dashboard view of the EMS system focused on positive patient outcome. The dashboard should be self-reporting and assessing with the capability to modify resources and trainings based upon periodic evaluation of data. Develop system performance measures using consistent definitions to ensure citizens and visitors receive reasonable access to prehospital emergency care based upon realistic expectations geographically throughout the county. After priority dispatch protocols are

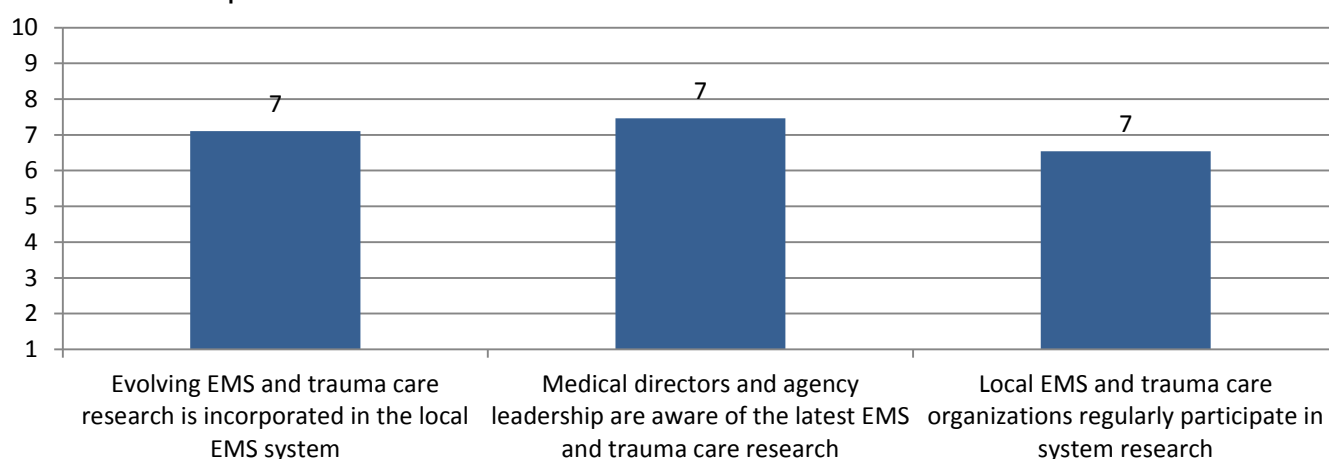
implemented, it may be appropriate to establish call-time performance standards. The response zones and time standards should be evaluated on an annual basis to ensure the criteria is reasonable, attainable and EMS care is being delivered with increased positive outcomes. System performance measures should be based upon a specific percentile to mitigate the effect of statistical challenges inherent to small populations in the context of emergency responses in rural and frontier areas.

- ✱ Conduct ongoing research to identify meaningful benchmarks that can be used to compare performance of the Grand County emergency medical and trauma services system with similar systems across the country.

EMTS Research

10 = Strongly Agree 1 = Strongly Disagree

Responded: 46 of 58



EMTS Research

Research is a process of systematic investigation designed to discover factual information and contribute to increased knowledge or understanding. No formal research is currently being conducted within the Grand County emergency medical and trauma services system. There is potential for conducting scientifically rigorous research in the future considering all EMS transport agencies, both air and ground, are submitting data from patient care reports to the state database and all three facilities are reporting data to the statewide trauma registry.

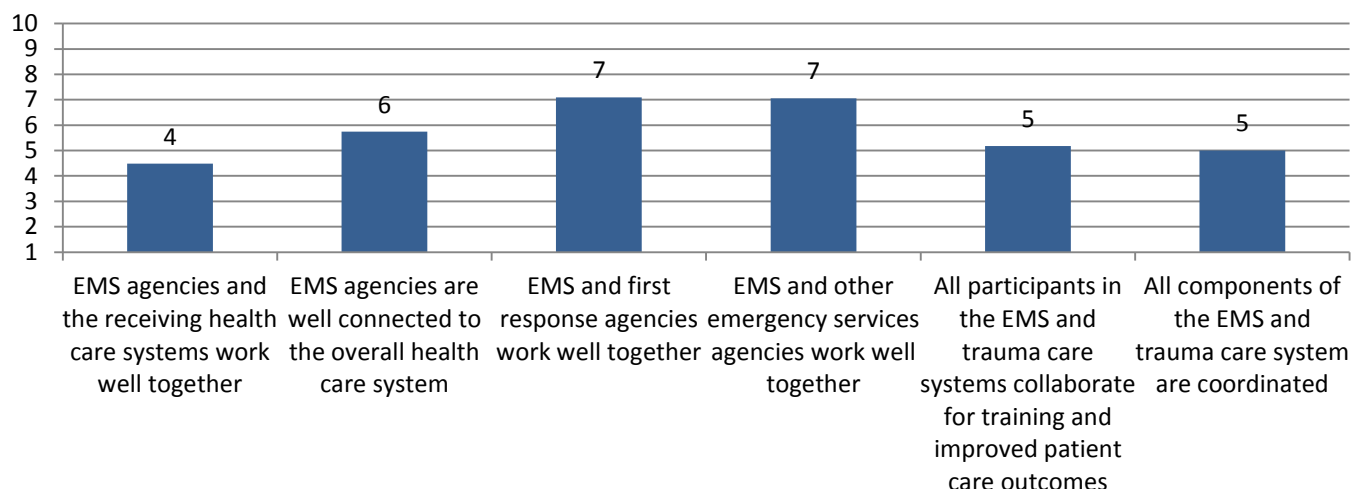
Recommendations

- ✱ Continue compliance with state data reporting requirements and consider using a multidisciplinary approach to enhance understanding of the processes that affect patient outcomes and to develop systemic improvements and decrease mortality and morbidity.

Integration of Health Services

10 = Strongly Agree 1 = Strongly Disagree

Responded: 51 of 58



Integration of Health Services

Integration of services and continuity of care can be one of the most challenging areas to accomplish within the health care system of any county. It requires coordination between a broad array of people, processes and organizations across the continuum of care to function in unison for the benefit of every patient. Highly-integrated systems provide effective bidirectional linkages to transfer information. Quality communication directly among all providers is essential to understand each patient's condition and continue appropriate interventions as patients are transferred to definitive care. It is equally important for information to flow through the provider community as well to educate caregivers and evaluate system and provider performance. Although the process can be daunting, integration of systems can be extremely beneficial to those involved providing expanded communication, continued training, as well as process and procedural improvement. An integrated system is comprised of individuals who agree and are committed to provide a continuum of coordinated services for a common purpose: quality patient care. All of the organizations and providers must agree to be held personally, organizationally, functionally and fiscally accountable to not only each other, but to the communities and populations they serve as well.

Overall the emergency medical and trauma services system provides quality care but the degree to which the various components work together varies significantly across the county. This perspective is consistent with the disparate opinions expressed during the stakeholder interviews and the distribution of ratings for this factor in the survey.

It appears operations of the response agencies involved in the Grand County emergency medical and trauma services system are only moderately integrated. In general, EMS, fire service, ski patrols, law enforcement and the National Park Service indicated that they work reasonably well together during their interactions in the field although command and control for Grand County EMS is largely independent of the other response agencies after the initial

dispatch. The interaction between the field agencies and East Grand Medical Center was very smooth and collaborative. The clinic has good working relations and communications with Winter Park Ski Patrol and also expressed that Grand County EMS provided quality care for patients that were transported to the clinic and for those transported out of the clinic for further evaluation or definitive care. The clinic provides on line medical control for EMS incidents in southeastern Grand County when the clinic is open and supports participation in the patient clinical experience by EMS providers from Winter Park Ski Patrol and Grand County EMS to enhance coordination of care and the knowledge base for field staff. The overall working relationship between the clinic staff and EMS personnel was described as positive. EMS personnel are willing and interested in assisting the clinic staff and each works well with the other. Communication between East Grand Medical Center and Grand County EMS leadership is good and when issues are raised, they are followed up on. Many patients transferred out of the facility are transferred to the tertiary care centers on the Front Range, typically by patient request as many of the patients are from that area. East Grand Medical Center staff noted that diagnostic capabilities have increased in Grand County, especially for imaging, with the new Middle Park Medical Center in Granby and some clinic patients are transferred there for further evaluation. Many patients in the area treated initially by EMS who require more definitive care bypass the clinic and are transported directly from the scene. East Grand Medical Center staff considered bypass to be appropriate in these cases since any patients transported from the scene to the clinic would require an additional transport as the helistop for air medical transport is not proximate to the clinic.

There is no significant communication or coordination between the physicians at East Grand Medical Center and the medical director for ski patrol and Grand County EMS. While there are no specific complaints about the current status, there is a feeling that it could be beneficial for both parties to have more involvement, and they expressed a willingness to participate in additional engagement.

Evidence of integration, cooperation or collaboration between Middle Park Medical Center-Granby and Grand County EMS is limited. This is problematic since each organization is the primary provider for its role in the continuum of emergency medical care in the county. The interaction between EMS and hospital staff when patients are brought to or transferred out of the facility is inconsistent. The process and responsibility for handing off patient care and providing verbal report varies. The physicians in Granby are not familiar with the EMS medical treatment protocols, do not know the clinical capacities and scope of practice for the EMS providers, and do not appear to value the prehospital providers. EMS providers lack knowledge of the clinical capabilities for the hospital, and an appreciation of the care by provided by the physicians is not apparent. EMS personnel no longer feel welcome in the emergency department, and whether or not field staff should assist the hospital staff with a complex patient during the transition of care is unclear. Grand County EMS stands by with a patient in the ambulance until a field supervisor arrives to observe the hand off of patients to the emergency department staff.

Communication between the hospital and Grand County EMS leadership is poor. Middle Park Medical Center-Granby does not get follow up, care rationale or loop closure when concerns are raised about prehospital care provided by EMS or the operational interface and there is no

satisfactory means to resolve concerns over care provided to patients who are transported to other hospitals by EMS. Grand County EMS feels they have made an effort to communicate with physicians at the hospital but have been unsuccessful in scheduling meetings and other quality management follow up communication has done little to impact modifications in clinical care.

The physicians at Middle Park Medical Center-Granby were especially critical of EMS operations. They disapproved of EMS scene times and expressed patient care would be improved if patients could be transported more quickly to their facility. EMS was also criticized for waiting on scene for air medical to arrive at incidents within minutes of the hospital in Granby. They felt these patients would be better cared for in the controlled environment of the emergency department with medical personnel to monitor the patient until the helicopter arrived. In addition, the physicians conveyed the opinion that advanced procedures were being performed in the field that are better done in the controlled environment of the emergency department, that unnecessary advanced procedures were performed for less critical patients, and that the helistop at Middle Park Medical Center-Granby should be used as the transfer site for more patients, not just those already at the hospital. They did note that not all of these situations can be documented because they are not privy to the EMS protocols and the patient may not have been brought to their hospital.

There is no significant communication or coordination between the physicians at Middle Park Medical Center-Granby and the medical director for Grand County EMS. The hospital physicians feel excluded from any participation in EMS planning, care review, protocols and linkage to the system they are a part of as a trauma center and the most prominent health care organization in the county. They believe there needs to be a role for local physicians in determining the scope of care provided by EMS. Remarkably, the working relationship between Grand County EMS and the practitioners at Middle Park Medical Center-Kremmling was reported to be good and generally exhibited a cooperative effort.

Neither hospital provides for its own security and relies on local law enforcement to watch patients with behavioral health or related issues and uses officers as the primary means to return patients to their home or lodging after a hospital visit. These functions are not a law enforcement responsibility, unless the patient is in custody, and reduces the ability for law enforcement to be available to serve the community. As is common in rural communities, the responsibility for transporting mental health patients to definitive care defaults to law enforcement and the onus falls primarily on the Sheriff's Department. The Sheriff's Department recognizes its role when required but it presents a significant challenge for the small department serving Grand County, and Middle Park Medical Center should explore other options.

Relationships between Grand County EMS and the air medical services in proximity to the area mirrored those with the medical facilities. One provider was very collaborative, another exhibited a high degree of cooperation and the third had a difficult working relationship on scenes, often foregoing involvement of their providers in care of the patient on scene. Direct working relationships between the air medical providers and the medical facilities were better with all parties reporting a high degree of satisfaction during the transition of patient care on these interactions.

The number of participants and their respective services differs across the Grand County emergency medical and trauma services system more than in most jurisdictions. This variability requires an increased effort to communicate and coordinate effectively among the system participants. All of the agencies do not have routine interaction with each other due to their particular role in the system and dispersion across a large geographic area. Grand County EMS interacts with all agencies as it fulfills its mission. This means that EMS must make a concerted effort to effectively communicate with all entities in a manner that is timely, participatory and open to the concerns and needs of the other providers.

During the on-site visit, almost all stakeholders expressed the most significant issue affecting the emergency medical and trauma services system in Grand County is poor relations and lack of cooperation between Middle Park Medical Center and Grand County EMS. There has been tension between these two organizations for some time although the relationship has deteriorated significantly in last couple of years. A comment from one of the system stakeholders summed up the general consensus by stating “each organization is siloed, insular and intransigent,” and defined siloed as “we operate in our own world,” insular as “we are not interested in looking to the outside for a better way,” and intransigent as “we are unwilling to change.” Stakeholders recognized the capabilities of each organization individually but acknowledged that neither organization is seen as interested or willing to take steps to resolve the situation jointly. This is seen as a barrier to effective integration and a risk to patient care. We find this to be an accurate description of the situation. Both organizations acknowledge the problem but point to the other as the barrier to improving the situation. Grand County EMS and Middle Park Medical Center both have answers to resolve the issue but they generally require the other to be the organization to make changes. Improving the relationship and developing an integrated and cooperative focus on patient care throughout the emergency medical and trauma services system will not happen in the short term. It also will not happen without external pressure on the leadership of both organizations.

The downward trajectory of the relationship between Grand County EMS and Middle Park Medical Center-Granby accelerated in 2016 when Kremmling Memorial Hospital District, the medical center’s parent organization, approached Grand County to take on the ambulance operation. Kremmling Memorial Hospital District had already built the hospital in Granby and was striving to be the premier health care provider in Grand County. Acquisition of Grand County EMS was proposed as another extension of the district’s vision to provide high-quality, viable health care locally. The ambulance service may also be eligible for enhanced reimbursement for transports of Medicare patients if operated by a designated critical access hospital. The motives perceived by the community, however, were much different. The voters authorized Grand County to impose a 2-mill property tax levy to subsidize the ambulance service in 2003. The move by Kremmling Memorial Hospital District to acquire Grand County EMS was viewed primarily as a means to access the revenue stream from this county-wide tax to help offset the cost of providing services in the eastern portion of the county. Acquiring the ambulance service would also benefit the district by bringing key operational aspects under the direction of hospital administration. The district would be able to capture additional revenue from patients that were formerly transported to East Grand Medical Center, Summit Medical Center or Yampa Valley Medical Center with revision to the ambulance destination

guideline. Hospital administration would also be able to lift the current limits on hours when an interfacility transport can be initiated. Stakeholders made note of the fact that the district has not extended its boundaries to include the area served by Middle Park Medical Center-Granby and this arrangement retains control of the new facility and its revenue streams under the district board in western Grand County rather than including representation from the east side of the county where the facility is located. These factors fundamentally threatened the organization's core values and would wipe out the significant improvements Grand County EMS has achieved in the level and quality of service under the current leadership.

The strained relationship with Grand County EMS became even more contentious when Middle Park Medical Center-Granby lodged a series of complaints about the care provided to patients during transport. Review of the documentation surrounding the complaints revealed a lengthy string of emails and invitations to meet in an attempt to achieve resolution. It was evident there is an absence of mutual respect and the exchange demonstrated a bilateral lack of understanding about clinical care capabilities and available resources. There is little trust between the physicians at Middle Park Medical Center-Granby and the Grand County EMS providers with respect to the patient care provided. The absence of a satisfactory resolution is clear evidence that the process has been ineffective and has not met the needs of either party. As noted previously, there is no routine interaction between the physicians at Middle Park Medical Center-Granby and the medical director for Grand County EMS.

In order to provide the highest level of emergency services to the public, however, a supportive and collaborative relationship needs to be established. While the historical reasons for the lack of cooperation must be acknowledged, it is time to move forward with a reset of the relationship. To restore an integrated care process, communication is key. Due to the mistrust and lack of common perception of where issues lie, this will not be a short term resolution. The physicians and top management at Middle Park Medical Center as well as the leadership team and medical director for Grand County EMS will have to take the time and make an effort to improve the relationship. The leadership of Middle Park Medical Center and Grand County EMS, as well as their respective governing bodies, may have to become involved in setting this expectation and holding their personnel accountable.

Recommendations

- ✱ Maintain the current county government model for delivery of emergency medical services in Grand County. There does not seem to be a reasonable need to explore a different method of service delivery and, as noted above, the service currently provided by Grand County EMS is exemplary on many levels, although not without some opportunities for improvement. In many ways, Grand County EMS exhibits the characteristics of a high performance, high reliability organization. The agency is visible and engaged with the community. They are well equipped and provide their personnel with top-notch equipment and ongoing education. Their billing practices are sound, collection rate is outstanding and level of fiscal accountability is excellent. The current governance model offers representation for all areas of the county and the fiscal structures are transparent and accountable to the constituents. The potential for enhanced reimbursement on Medicare transports is a consideration but only affects the 11 percent of the transport volume attributed to this payer. The vast majority of stakeholders interviewed hold Grand County

EMS in high regard and have the perception that their team does an exceptional job serving the communities within Grand County. The Grand County Board of Commissioners and county administration should be commended for their continued support of Grand County EMS and have every right to be proud of this model of service delivery for their community.

- ✱ Formally establish and utilize cohesive, consistent command structure for response to EMS incidents in Grand County and clearly define the chain of command, roles and responsibilities to create reasonable expectations for each agency that is called to respond. All response agencies (law enforcement, fire services, EMS, search and rescue, etc.) should utilize the formal command system when responding to incidents and conduct all radio traffic on the channels assigned for the incident to maintain situational awareness for all responders.
- ✱ Establish a consistent policy for interfacility transports using a collaborative decision model that incorporates perspectives of the facilities, physicians, nursing staff and EMS providers potentially involved in the specific transport to ensure the patient can be transported safely and receive appropriate care. In addition, each transport must be reviewed for utilization of appropriate transport by a multidisciplinary team through a joint quality management process. The collaborative process developed by the Northwest RETAC (attached as Appendix E) can serve as a foundation to enhance patient safety and optimize use of the ground transport resources available in Grand County.
- ✱ Coordinate all requests for prehospital air medical services or other resources based outside the county through the Grand County Communications Center on the appropriate communications channel for the incident. The closest available air medical service licensed by the State of Colorado should be dispatched for patients airlifted directly from an incident scene. For incidents under jurisdiction of the National Park Service, the current practice that all requests for air medical services must be initiated by the appropriate park personnel on the radio channel for the incident in accordance with federal requirements must be continued.
- ✱ Improve the flow of communication between Middle Park Medical Center and Grand County EMS. As the most prominent providers of emergency medical and trauma services, these two organizations should establish routine meetings at least quarterly to review systems integration issues. These meetings should have a specific agenda agreed to by both organizations and written meeting minutes with responsibilities rotated between the two organizations, the host serving as chair and the guest serving as secretary of each meeting to avoid any asymmetry in ownership. Initially, the meetings should involve members of the governing boards or senior leadership from each organization to establish expectations and respectfully engage to address operational concerns as work toward an integrated emergency medical and trauma services system commences. Much of what is involved is technical and intertwined, and neither the board of county commissioners nor the hospital district board of directors has in-depth knowledge of emergency medical and trauma services systems, but these sessions can also serve to educate these elected officials on the inner workings of these complex structures. As the relationship matures, attendance can be pared down to those directly involved with the interactions between the organizations and patients.
- ✱ Leadership at Grand County EMS should undertake an initiative to improve the regularity and quality of routine communication with entities that are part of the emergency medical and trauma services system or interact with the system on a regular basis. This does not mean that if issues arise, they must wait for a routine or scheduled meeting, but it would allow for a focus on improvement in function rather than only communicating with there is

a specific problem to be addressed. Most of the issues raised by the system stakeholders can be resolved with better and regular communications and a willingness to consider their needs. Feedback and loop closure on issues previously discussed should be a part of the regular agenda.

- ✱ As noted throughout this section, the hurdles to improving the emergency medical and trauma services system are significant, time consuming and will not improve without substantial challenges. The issues are multifaceted. An outside consultant knowledgeable in emergency medical and trauma services systems would move the process along more rapidly if supported by the commissioners and hospital district board. The consultant should be engaged by, and responsible to, the commissioners but the hospital district board should be involved in the selection and development of expectations of the consultant. While the department cannot recommend a specific consultant, there are numerous qualified consultants in Colorado that can be of assistance.
- ✱ Middle Park Medical Center should undertake an initiative to meet with the mental health providers, community organizations and local law enforcement agencies to address hospital security, transport and monitoring for behavioral health patients and return of patients to their home or lodging after a hospital visit. The focus of this initiative is to determine what options may be available in Grand County and to agree on expectations and service levels.
- ✱ Some areas of conflict between Middle Park Medical Center and Grand County EMS arise from the misunderstanding of each other's capabilities and protocols, and detracts from optimum patient care by all providers. The hospitals and ambulance service must encourage and accept input from one another to coordinate appropriate treatment and transport policies, procedures and protocols that integrate facility and EMS capabilities. The current system does not appear to solicit or accept input from medical directors outside of Grand County. All emergency medical and trauma services organizations must actively seek external peer-supported research to ensure that medical treatment protocols are meeting current national and state standards of care. This is important to integrate treatment protocols involving patient transfers to Front Range and other regional hospitals.
- ✱ All facilities that provide on-line medical direction or receive patients from any EMS agency should have convenient access to the current medical treatment protocols and the physicians should be familiar with the scope of practice for the local EMS providers. Every EMS agency should maintain copies of the most current medical treatment protocols at each facility that provides them with on-line medical direction or receives patients, and their medical director should educate the physicians at the facility to help them faithfully comply with the standards of care expected by the medical director. For example, Grand County EMS should supply and maintain copies of the most current medical treatment protocols at East Grand Medical Center, Middle Park Medical Center-Granby and Middle Park Medical Center-Kremmling and Dr. Nichols should provide ongoing education for the physicians at these three facilities.
- ✱ Initiate communication and collaboration between the EMS medical directors in Grand County. Enhanced cooperation between the medical directors will help to ensure care is provided consistent with community expectations everywhere in the county, enhance quality of medical direction through sharing of best practices and reduce duplicative efforts. The geographic dispersion of the EMS medical directors across both sides of the Continental Divide, combined with closure of the Trail Ridge Road for much of the year, creates some logistical challenges but it should not be too difficult to equitably share the burden of travel or conducting meetings remotely for this small group. Dr. Chew is a valuable resource through his experience with the more collaborative medical direction

programs in Boulder and Larimer Counties and the Northeast Colorado RETAC and will complement the capabilities of the medical directors on the western side of the divide.

- ✱ Facilitate communications with local physicians, and ensure EMS protocols are consistent with local medical care standards and capabilities of local medical facilities by recruiting a local physician to serve as an assistant EMS medical director for Grand County EMS. The assistant EMS medical director can also provide outreach to increase knowledge of the EMS protocols for physicians who provide on-line medical direction for the EMS providers in the field and build collaboration and communication among the local medical community.
- ✱ Establish a formal, accountable process to address complaints at Grand County EMS. Post information about the complaint process so it is accessible to patients, other providers and the public. Specify the process and responsible party for complaint intake, complaint validation, threshold for initiating a complaint investigation and complaint resolution. Clearly describe the expectations for methods of communication, time frames, loop closure and feedback to the complainant. Issues concerning patient care should typically be addressed in person and verbal communications should be supplemented with written documentation of the findings.
- ✱ Establish a formal, accountable process to address complaints at Middle Park Medical Center facilities. Post information about the complaint process so it is accessible to patients, other providers and the public. Specify the process and responsible party for complaint intake, complaint validation, threshold for initiating a complaint investigation and complaint resolution. Clearly describe the expectations for methods of communication, time frames, loop closure and feedback to the complainant. Issues concerning patient care should typically be addressed in person and verbal communications should be supplemented with written documentation of the findings.
- ✱ Promote positive interactions between providers at Grand County EMS and practitioners at the medical facilities in Grand County, especially Middle Park Medical Center-Granby. This could be accomplished by creating opportunities for staff from the medical facilities to ride along with Grand County EMS and for Grand County EMS staff to shadow practitioners at the facilities and obtain procedural experience in the medical facilities. Implement operating room rotations for advanced life support EMS providers to obtain consistent intubation experience as part of skill maintenance for their rapid sequence intubation program. Share costs and increase joint participation in continuing medical education opportunities offered at any of the emergency medical and trauma services organizations. Support the facility staff and field providers who voice a willingness to work together and break down barriers to allow providers from both organizations to work collaboratively on complex cases transported to a local facility by ambulance. Develop clinical education agreements and establish the legal framework necessary to allow EMS personnel to function clinically within the hospital environment. Synchronize quality management processes across organizations to permit multidisciplinary participation in joint case reviews.

Summary of Recommendations

Grand County Recommendations

Short-term (1 to 2 years)

- ✱ Update the Grand County ambulance licensing resolution to comply with governing law and current practices. Adopt an ambulance licensing resolution that addresses anticipated changes in state rules pertaining to licensure of ground ambulance services planned for adoption by the Colorado Board of Health later this year.
- ✱ Consider establishing a county emergency services council in the updated ambulance licensing resolution. This council should be authorized to advise the Board of County Commissioners on emergency medical and trauma services and regularly report the current system status to the Board. Empower the council to recommend priorities for local system development and prioritize requests for supplemental funding. All agencies providing any level of emergency medical and trauma services in Grand County should have representation. Membership should include licensed ambulance services, public safety communications, fire rescue agencies, designated trauma centers, air medical, search and rescue, ski patrols, EMS medical direction, local emergency management and public health.
- ✱ Maintain the current county government model for delivery of emergency medical services in Grand County. There does not seem to be a reasonable need to explore a different method of service delivery and, as noted above, the service currently provided by Grand County EMS is exemplary on many levels, although not without some opportunities for improvement. In many ways, Grand County EMS exhibits the characteristics of a high performance, high reliability organization. The agency is visible and engaged with the community. They are well equipped and provide their personnel with top-notch equipment and ongoing education. Their billing practices are sound, collection rate is outstanding and level of fiscal accountability is excellent. The current governance model offers representation for all areas of the county and the fiscal structures are transparent and accountable to the constituents. The potential for enhanced reimbursement on Medicare transports is a consideration but only affects the 11 percent of the transport volume attributed to this payer. The vast majority of stakeholders interviewed hold Grand County EMS in high regard and have the perception that their team does an exceptional job serving the communities within Grand County. The Grand County Board of Commissioners and county administration should be commended for their continued support of Grand County EMS and have every right to be proud of this model of service delivery for their community.
- ✱ As noted throughout this report, the hurdles to improving the emergency medical and trauma services system are significant, time consuming and will not improve without substantial challenges. The issues are multifaceted. An outside consultant knowledgeable in emergency medical and trauma services systems would move the process along more rapidly if supported by the commissioners and hospital district board. The consultant should be engaged by, and responsible to, the commissioners but the hospital district board should be involved in the selection and development of expectations of the consultant. While the department cannot recommend a specific consultant, there are numerous qualified consultants in Colorado that can be of assistance.
- ✱ Establish a formal, accountable process to address complaints at Grand County EMS. Post information about the complaint process so it is accessible to patients, other providers and

the public. Specify the process and responsible party for complaint intake, complaint validation, threshold for initiating a complaint investigation and complaint resolution. Clearly describe the expectations for methods of communication, time frames, loop closure and feedback to the complainant. Issues concerning patient care should typically be addressed in person and verbal communications should be supplemented with written documentation of the findings.

Medium-term (3 to 5 years)

- ✱ The county should review the amount and distribution of federal payments in lieu of taxes to determine if current allocations are consistent with the services provided to the federal lands and increase the allocation for Grand County EMS as indicated. Ambulances regularly respond to calls in Rocky Mountain National Park, Arapaho, Routt and White River National Forests, Bureau of Reclamation facilities and Bureau of Land Management properties.
- ✱ The Board of County Commissioners should seek funding opportunities to enhance reliability of the county VHF system to support paging and ensure resilient public safety communications capabilities.

Long-term (5 years)

- ✱ At some point, it may be necessary to consider going to the citizens and asking for an increased mill levy to support Grand County EMS. This would likely not be an option in the near term and will require significant advanced planning to identify methods of educating the voters about a mill levy increase in terms of service delivery and enhanced value to the community.

Grand County Communications Center Recommendations

Short-term (1 to 2 years)

- ✱ Develop and implement a public information campaign utilizing local media, resort information television and web-based media to educate the public about the Code Red emergency notification system and how to register a telephone to receive notifications.
- ✱ Collaborate with user agencies to develop and implement a process to create county-wide dispatch standard operating procedures to improve system efficiency, assist the dispatchers in the performance of their duties, ensure all responders use the system in a unified method and enhance responder safety. For example, about 30 percent of the Grand County EMS call volume involves transports to tertiary care and specialty centers on the Front Range. Using the statewide DTR system, the Grand County Communications Center now has the capability to conduct regular status checks for the Grand County EMS crews during transports outside the county.
- ✱ Implement the capability to record communications between EMS providers in the field and on-line medical direction. This information is important for quality management and compliance activities. It can also be invaluable for after-action reports.
- ✱ Coordinate all requests for prehospital air medical services or other resources based outside the county through the Grand County Communications Center on the appropriate communications channel for the incident. The closest available air medical service licensed by the State of Colorado should be dispatched for patients airlifted directly from an incident scene. For incidents under jurisdiction of the National Park Service, the current practice that all requests for air medical services must be initiated by the appropriate park

personnel on the radio channel for the incident in accordance with federal requirements must be continued.

Medium-term (3 to 5 years)

- ✱ Use of emergency lights and siren should be minimized during scene response and patient transport. The usage rate is already low but may be reduced further for scene responses by EMS medical direction and EMS agency leadership working with the communications center to assign an appropriate response mode configuration to each emergency medical dispatch determinant. Response mode configurations should identify the specific agencies that are needed to effectively manage the incident type and the response mode, emergent or routine, appropriate for each unit. Emergency patient transports can be decreased further through careful review of current practice to ensure lights and sirens are only used for the limited number of patient conditions that would benefit from emergent transport to the hospital. Incorporate dispatch response mode recommendations into the training for providers in all emergency response agencies to reduce unwarranted use of lights or siren. Medical oversight should include dispatch quality management review, compliance with response mode configurations and ongoing evaluation to assess effectiveness of response mode configurations. All response agencies should improve driver training to encourage safe operator behavior and habits, particularly in emergency lights and siren responses.

Grand County EMS Recommendations

Short-term (1 to 2 years)

- ✱ Recruit and assist Grand County residents to become part of the emergency medical and trauma services system. Continue to support the initial EMT training program in the high schools. This program is highly regarded throughout the county and has clearly demonstrated its success by the five current staff members at Grand County EMS who graduated from the program. Maintaining a sufficient proportion of staff that lives in the area is also important to build a resilient system that has reserve capacity to step in to meet extraordinary peaks in service demand that happen from time to time.
- ✱ Continue to conduct exit interviews with each employee leaving Grand County EMS. Develop a formal process to track the reasons staff leave to help identify specific actions that could be taken to reduce turnover. It is not important to completely differentiate every reason for separation in painstaking detail but grouping them into general categories (i.e. compensation, limited opportunities for others in employee's household, etc.) would provide useful information to identify any trends. While every EMS agency is different and has its own specific challenges, identify services with similar characteristics for comparison. Internal tracking is valuable but having an external benchmark will help identify what is within normal range.
- ✱ Conduct "stay" interviews with Grand County EMS staff on an annual basis. These interviews provide the opportunity to determine what is important to employees and see what can be done to retain current staff members who are considering leaving. Stay interviews have a specific purpose and should not be performed in conjunction with periodic performance evaluations.
- ✱ Engage the Grand County EMS field staff to explore alternative methods to effectively conduct official communications and beginning of shift processes. Recognize that multiple platforms may be required to optimize messaging across a diverse range of age groups and varying levels of technical sophistication.

- ✱ Refine the Grand County EMS onboarding and orientation process and apply it consistently. Responsibility for these processes may be vested in one person although the process should be well-documented so that if the lead person is not available, the welcome and education of new employees, and assurance of their competency, is not compromised.
- ✱ Include a local physician representative in EMS medical protocol development to ensure consistency with local medical care standards, compatibility with services available at local medical facilities, and serve as a liaison between the prehospital providers and the local medical community. Physician input from local receiving facilities is essential to create medical treatment protocols that are consistent with medical care standards in the community.
- ✱ Grand County EMS should consider the effects on external agencies when developing procedural changes and communicate with the other provider agencies throughout implementation to avoid disparate expectations between agencies and discontinuity in patient care. Collaborating with the external agencies during the development phase and including their members in training during implementation yields more effective changes that are less disruptive to other participants in the continuum of patient care.
- ✱ Unrestrained vehicle occupants are at significantly greater risk of injury or death, and pose a risk to other vehicle occupants, in the event of a crash. Grand County EMS should have written policies that require occupants in the cab of any emergency vehicle to be restrained by a seat belt and shoulder harness any time the vehicle is in motion. Further, any patient or other person riding in an emergency vehicle must be properly restrained any time the vehicle is in motion. This includes the use of all cot straps as designed by the manufacturer. Finally, Grand County EMS should develop a culture of safety that emphasizes use of shoulder and seat belt restraints for any provider in the patient care compartment as much as possible. This culture emphasis should include promoting the concept of implementing the vast majority of patient care interventions when the emergency vehicle is stationary, facilitating the use of restraints when the vehicle is in motion.
- ✱ Re-establish efforts to communicate continuing education and skills training opportunities to prehospital providers and medical facility staff. Open enrollment for courses appropriate for the needs of prehospital and medical facility staff to providers from both disciplines jointly plan these educational opportunities. This is an excellent way for the staff members from multiple organizations to come together with a joint objective. Foothills RETAC can be a resource for these programs.
- ✱ Grand County EMS must completely integrate into the county communications system. The use of the dedicated EMS tactical channel should be limited to essential, non-emergency communications. Prehospital requests for air medical resources must be accessed through the Grand County Communications Center to minimize potential confusion, reduce duplication and to enhance responder safety. The primary goal is to ensure all agencies involved in an emergency response are aware of important communication in real-time.
- ✱ Implement the capability to record communications between EMS providers in the field and on-line medical direction. This information is important for quality management and compliance activities. It can also be invaluable for after-action reports.
- ✱ Continue to be active in special event standby activities. Educate staff on how to make these events an opportunity for positive interaction with the public.

- ✱ Middle Park Medical Center and Grand County EMS should plan resource allocation and earmark staff time to fully participate in planned incident drills with other agencies.
- ✱ Develop defined processes for EMS chart review to include clinical filters and a standardized approach to help identify and address gaps in provider knowledge or skills. Create mechanisms to demonstrate that appropriate training, remediation or other corrective action has been taken when issues are identified in the quality management process. Perform mandatory quality reviews of STEMI, stroke, sepsis and critical trauma patients.
- ✱ Grand County EMS should resurrect the internal quality management committee that included participation from the field providers. The field staff recognize the importance of a vibrant quality management process and want to participate. When this committee was in place, the staff felt supported and not threatened by the process. Quality reviews focused more on improvement and education rather than being punitive, and feedback was communicated in a timely manner.
- ✱ Participate in the regional coordinating group for EMS medical directors and agency clinical coordinators to formalize evaluation techniques at a regional level. This group can also evaluate regional protocols based on best practices from rural EMS medicine.
- ✱ Establish a consistent policy for interfacility transports using a collaborative decision model that incorporates perspectives of the facilities, physicians, nursing staff and EMS providers potentially involved in the specific transport to ensure the patient can be transported safely and receive appropriate care. In addition, each transport must be reviewed for utilization of appropriate transport by a multidisciplinary team through a joint quality management process. The collaborative process developed by the Northwest RETAC (attached as Appendix E) can serve as a foundation to enhance patient safety and optimize use of the ground transport resources available in Grand County.
- ✱ Improve the flow of communication between Middle Park Medical Center and Grand County EMS. As the most prominent providers of emergency medical and trauma services, these two organizations should establish routine meetings at least quarterly to review systems integration issues. These meetings should have a specific agenda agreed to by both organizations and written meeting minutes with responsibilities rotated between the two organizations, the host serving as chair and the guest serving as secretary of each meeting to avoid any asymmetry in ownership. Initially, the meetings should involve members of the governing boards or senior leadership from each organization to establish expectations and respectfully engage to address operational concerns as work toward an integrated emergency medical and trauma services system commences. Much of what is involved is technical and intertwined, and neither the board of county commissioners nor the hospital district board of directors has in-depth knowledge of emergency medical and trauma services systems, but these sessions can also serve to educate these elected officials on the inner workings of these complex structures. As the relationship matures, attendance can be pared down to those directly involved with the interactions between the organizations and patients.
- ✱ Leadership at Grand County EMS should undertake an initiative to improve the regularity and quality of routine communication with entities that are part of the emergency medical and trauma services system or interact with the system on a regular basis. This does not mean that if issues arise, they must wait for a routine or scheduled meeting, but it would allow for a focus on improvement in function rather than only communicating with there is a specific problem to be addressed. Most of the issues raised by the system stakeholders

can be resolved with better and regular communications and a willingness to consider their needs. Feedback and loop closure on issues previously discussed should be a part of the regular agenda.

- ✱ All facilities that provide on-line medical direction or receive patients from any EMS agency should have convenient access to the current medical treatment protocols and the physicians should be familiar with the scope of practice for the local EMS providers. Every EMS agency should maintain copies of the most current medical treatment protocols at each facility that provides them with on-line medical direction or receives patients, and their medical director should educate the physicians at the facility to help them faithfully comply with the standards of care expected by the medical director. For example, Grand County EMS should supply and maintain copies of the most current medical treatment protocols at East Grand Medical Center, Middle Park Medical Center-Granby and Middle Park Medical Center-Kremmling and Dr. Nichols should provide ongoing education for the physicians at these three facilities.
- ✱ Establish a formal, accountable process to address complaints at Grand County EMS. Post information about the complaint process so it is accessible to patients, other providers and the public. Specify the process and responsible party for complaint intake, complaint validation, threshold for initiating a complaint investigation and complaint resolution. Clearly describe the expectations for methods of communication, time frames, loop closure and feedback to the complainant. Issues concerning patient care should typically be addressed in person and verbal communications should be supplemented with written documentation of the findings.

Medium-term (3 to 5 years)

- ✱ Grand County EMS should consider increasing the billing staff by one person. As call volume increases, it is important to have adequate staffing in the area that brings in revenue. There are also operational inefficiencies that occur when one of the two people with special training are out for vacation, illness or injury. Timely submission of claims, accurate coding and maintenance of follow-up processes slow down considerably when staffing is reduced, even temporarily, to just one person. It also increases the likelihood for errors. These factors will ultimately decrease the collection rate and significantly reduce customer satisfaction.
- ✱ Recruit a local physician to serve as an assistant EMS medical director for Grand County EMS to facilitate communications with local physicians, ensure EMS protocols are consistent with the local medical care standards and stay current with the capabilities of local medical facilities. The assistant EMS medical director can also provide outreach to increase knowledge of the EMS protocols for physicians who provide on-line medical direction for the EMS providers in the field and build collaboration and communication among the local medical community.
- ✱ Use of emergency lights and siren should be minimized during scene response and patient transport. The usage rate is already low but may be reduced further for scene responses by EMS medical direction and EMS agency leadership working with the communications center to assign an appropriate response mode configuration to each emergency medical dispatch determinant. Response mode configurations should identify the specific agencies that are needed to effectively manage the incident type and the response mode, emergent or routine, appropriate for each unit. Emergency patient transports can be decreased further through careful review of current practice to ensure lights and sirens are only used for the limited number of patient conditions that would benefit from emergent transport to the

hospital. Incorporate dispatch response mode recommendations into the training for providers in all emergency response agencies to reduce unwarranted use of lights or siren. Medical oversight should include dispatch quality management review, compliance with response mode configurations and ongoing evaluation to assess effectiveness of response mode configurations. All response agencies should improve driver training to encourage safe operator behavior and habits, particularly in emergency lights and siren responses.

- ✱ Take advantage of industry-specific leadership and management training for the ambulance service supervisory and management staff. The ambulance service directors are experienced and, from all appearances, they have performed well. However, it is important that they each receive the necessary tools to guide and help with the multitude of issues that even experienced ambulance service managers face. Initially consider course offerings like the National Fire Academy-Management of Emergency Medical Services, American Ambulance Association-Ambulance Service Management, Northwest RETAC EMS Leadership Conference and the National Rural EMS Conference and provide funding, travel, backfill or other support necessary for the director to attend.
- ✱ Implement MDTs for Grand County EMS to enhance communications between the communications center and response units in the field once the technology requirements and connectivity needs can be supported. Mapping and vehicle location capabilities can improve response, situational awareness and overall responder safety. Continue to explore the available options as technology continues to improve and expand capabilities.
- ✱ Implement the billing program with direct connection to the patient care reporting system at Grand County EMS. Improved capability to process billing information in an accurate and timely manner will increase personnel efficiency and help to maintain the current, impressive collection rates.
- ✱ Create a public education coordinator position at Grand County EMS with clear performance expectations. Consider combining the position with prevention activities. Consider coordinators at all stakeholder agencies, as well.
- ✱ Consider annual activities during National EMS Week and National Emergency Nurses Week to recognize personnel and share their vital role with the community. Explore access to funding from the Foothills RETAC to assist in the activities.
- ✱ Identify system performance measures for periodic review and use available data to conduct an evidence-based evaluation. For example, several stakeholders expressed concerns that ambulance scene times were too long on calls where advanced airway procedures were performed. An analysis of scene time data will identify if the time interval is actually too long, further investigation can determine the cause and any corrections can be addressed through training or process changes.
- ✱ Promote positive interactions between providers at Grand County EMS and practitioners at the medical facilities in Grand County, especially Middle Park Medical Center-Granby. This could be accomplished by creating opportunities for staff from the medical facilities to ride along with Grand County EMS and for Grand County EMS staff to shadow practitioners at the facilities and obtain procedural experience in the medical facilities. Implement operating room rotations for advanced life support EMS providers to obtain consistent intubation experience as part of skill maintenance for their rapid sequence intubation program. Share costs and increase joint participation in continuing medical education opportunities offered at any of the emergency medical and trauma services organizations. Support the facility staff and field providers who voice a willingness to work together and break down barriers to allow providers from both organizations to work collaboratively on

complex cases transported to a local facility by ambulance. Develop clinical education agreements and establish the legal framework necessary to allow EMS personnel to function clinically within the hospital environment. Synchronize quality management processes across organizations to permit multidisciplinary participation in joint case reviews.

Long-term (5 years)

- ✱ Implement a connectivity hub to link the Grand County EMS patient care report system with the electronic health record systems at the regular receiving facilities. Real time access to prehospital patient care data will enhance continuity of care and reduce the amount of time Grand County EMS administrative personnel have to spend responding to requests for this information.
- ✱ Continue compliance with state data reporting requirements and consider using a multidisciplinary approach to enhance understanding of the processes that affect patient outcomes and to develop systemic improvements and decrease mortality and morbidity.

Grand County OEM Recommendations

Short-term (1 to 2 years)

- ✱ The emergency manager should meet with each co-responding stakeholder to address the concerns expressed about the emergency management organizational structure and set a foundation for collaboration and mutual respect moving forward.
- ✱ Conduct a table-top exercise in the next 6-8 months that would include all relevant stakeholders and outline key elements of the mass casualty plan. Over the next 12-24 months, consider a series of table-top exercises that gradually increase in size and complexity. Once stakeholders have reached a comfort level with their particular roles and responsibilities along with executing common elements of mass casualty management, consider developing a county-wide exercise that will test the concepts covered in the table-top exercises.
- ✱ Middle Park Medical Center and Grand County EMS should plan resource allocation and earmark staff time to fully participate in planned incident drills with other agencies.
- ✱ Develop and train on a reliable methodology for patient tracking. Although there are commercially developed programs that utilize computers, code scanners and other digital technology, the quickest, cheapest and proven processes involve pencil and paper.

East Grand Medical Center Recommendations

Short-term (1 to 2 years)

- ✱ Re-establish efforts to communicate continuing education and skills training opportunities to prehospital providers and medical facility staff. Open enrollment for courses appropriate for the needs of prehospital and medical facility staff to providers from both disciplines jointly plan these educational opportunities. This is an excellent way for the staff members from multiple organizations to come together with a joint objective. Foothills RETAC can be a resource for these programs.

- ✱ Implement the capability to record communications between EMS providers in the field and on-line medical direction. This information is important for quality management and compliance activities. It can also be invaluable for after-action reports.
- ✱ Establish a consistent policy for interfacility transports using a collaborative decision model that incorporates perspectives of the facilities, physicians, nursing staff and EMS providers potentially involved in the specific transport to ensure the patient can be transported safely and receive appropriate care. In addition, each transport must be reviewed for utilization of appropriate transport by a multidisciplinary team through a joint quality management process. The collaborative process developed by the Northwest RETAC (attached as Appendix E) can serve as a foundation to enhance patient safety and optimize use of the ground transport resources available in Grand County.
- ✱ All facilities that provide on-line medical direction or receive patients from any EMS agency should have convenient access to the current medical treatment protocols and the physicians should be familiar with the scope of practice for the local EMS providers. Every EMS agency should maintain copies of the most current medical treatment protocols at each facility that provides them with on-line medical direction or receives patients, and their medical director should educate the physicians at the facility to help them faithfully comply with the standards of care expected by the medical director. For example, Grand County EMS should supply and maintain copies of the most current medical treatment protocols at East Grand Medical Center, Middle Park Medical Center-Granby and Middle Park Medical Center-Kremmling and Dr. Nichols should provide ongoing education for the physicians at these three facilities.
- ✱ Establish a formal, accountable process to address complaints at Middle Park Medical Center facilities. Post information about the complaint process so it is accessible to patients, other providers and the public. Specify the process and responsible party for complaint intake, complaint validation, threshold for initiating a complaint investigation and complaint resolution. Clearly describe the expectations for methods of communication, time frames, loop closure and feedback to the complainant. Issues concerning patient care should typically be addressed in person and verbal communications should be supplemented with written documentation of the findings.

Medium-term (3 to 5 years)

- ✱ Promote positive interactions between providers at Grand County EMS and practitioners at the medical facilities in Grand County, especially Middle Park Medical Center-Granby. This could be accomplished by creating opportunities for staff from the medical facilities to ride along with Grand County EMS and for Grand County EMS staff to shadow practitioners at the facilities and obtain procedural experience in the medical facilities. Implement operating room rotations for advanced life support EMS providers to obtain consistent intubation experience as part of skill maintenance for their rapid sequence intubation program. Share costs and increase joint participation in continuing medical education opportunities offered at any of the emergency medical and trauma services organizations. Support the facility staff and field providers who voice a willingness to work together and break down barriers to allow providers from both organizations to work collaboratively on complex cases transported to a local facility by ambulance. Develop clinical education agreements and establish the legal framework necessary to allow EMS personnel to function clinically within the hospital environment. Synchronize quality management processes across organizations to permit multidisciplinary participation in joint case reviews.

Long-term (5 years)

- ✱ Implement a connectivity hub to link the Grand County EMS patient care report system with the electronic health record systems at the regular receiving facilities. Real time access to prehospital patient care data will enhance continuity of care and reduce the amount of time Grand County EMS administrative personnel have to spend responding to requests for this information.

Middle Park Medical Center Recommendations

Short-term (1 to 2 years)

- ✱ Re-establish efforts to communicate continuing education and skills training opportunities to prehospital providers and medical facility staff. Open enrollment for courses appropriate for the needs of prehospital and medical facility staff to providers from both disciplines jointly plan these educational opportunities. This is an excellent way for the staff members from multiple organizations to come together with a joint objective. Foothills RETAC can be a resource for these programs.
- ✱ Implement the capability to record communications between EMS providers in the field and on-line medical direction. This information is important for quality management and compliance activities. It can also be invaluable for after-action reports.
- ✱ Middle Park Medical Center and Grand County EMS should plan resource allocation and earmark staff time to fully participate in planned incident drills with other agencies.
- ✱ Establish a consistent policy for interfacility transports using a collaborative decision model that incorporates perspectives of the facilities, physicians, nursing staff and EMS providers potentially involved in the specific transport to ensure the patient can be transported safely and receive appropriate care. In addition, each transport must be reviewed for utilization of appropriate transport by a multidisciplinary team through a joint quality management process. The collaborative process developed by the Northwest RETAC (attached as Appendix E) can serve as a foundation to enhance patient safety and optimize use of the ground transport resources available in Grand County.
- ✱ Improve the flow of communication between Middle Park Medical Center and Grand County EMS. As the most prominent providers of emergency medical and trauma services, these two organizations should establish routine meetings at least quarterly to review systems integration issues. These meetings should have a specific agenda agreed to by both organizations and written meeting minutes with responsibilities rotated between the two organizations, the host serving as chair and the guest serving as secretary of each meeting to avoid any asymmetry in ownership. Initially, the meetings should involve members of the governing boards or senior leadership from each organization to establish expectations and respectfully engage to address operational concerns as work toward an integrated emergency medical and trauma services system commences. Much of what is involved is technical and intertwined, and neither the board of county commissioners nor the hospital district board of directors has in-depth knowledge of emergency medical and trauma services systems, but these sessions can also serve to educate these elected officials on the inner workings of these complex structures. As the relationship matures, attendance can be pared down to those directly involved with the interactions between the organizations and patients.
- ✱ All facilities that provide on-line medical direction or receive patients from any EMS agency should have convenient access to the current medical treatment protocols and the

physicians should be familiar with the scope of practice for the local EMS providers. Every EMS agency should maintain copies of the most current medical treatment protocols at each facility that provides them with on-line medical direction or receives patients, and their medical director should educate the physicians at the facility to help them faithfully comply with the standards of care expected by the medical director. For example, Grand County EMS should supply and maintain copies of the most current medical treatment protocols at East Grand Medical Center, Middle Park Medical Center-Granby and Middle Park Medical Center-Kremmling and Dr. Nichols should provide ongoing education for the physicians at these three facilities.

Medium-term (3 to 5 years)

- ✱ Middle Park Medical Center should undertake an initiative to meet with the mental health providers, community organizations and local law enforcement agencies to address hospital security, transport and monitoring for behavioral health patients and return of patients to their home or lodging after a hospital visit. The focus of this initiative is to determine what options may be available in Grand County and to agree on expectations and service levels.
- ✱ Promote positive interactions between providers at Grand County EMS and practitioners at the medical facilities in Grand County, especially Middle Park Medical Center-Granby. This could be accomplished by creating opportunities for staff from the medical facilities to ride along with Grand County EMS and for Grand County EMS staff to shadow practitioners at the facilities and obtain procedural experience in the medical facilities. Implement operating room rotations for advanced life support EMS providers to obtain consistent intubation experience as part of skill maintenance for their rapid sequence intubation program. Share costs and increase joint participation in continuing medical education opportunities offered at any of the emergency medical and trauma services organizations. Support the facility staff and field providers who voice a willingness to work together and break down barriers to allow providers from both organizations to work collaboratively on complex cases transported to a local facility by ambulance. Develop clinical education agreements and establish the legal framework necessary to allow EMS personnel to function clinically within the hospital environment. Synchronize quality management processes across organizations to permit multidisciplinary participation in joint case reviews.

Long-term (5 years)

- ✱ Implement a connectivity hub to link the Grand County EMS patient care report system with the electronic health record systems at the regular receiving facilities. Real time access to prehospital patient care data will enhance continuity of care and reduce the amount of time Grand County EMS administrative personnel have to spend responding to requests for this information.

EMTS System Recommendations

Short-term (1 to 2 years)

- ✱ Continue to seek grant funding to assist with specific projects. Poring over grant program eligibility guidance is tedious, but perseverance may pay off with funding assistance. Consider local foundations and review the Colorado Grants Guide periodically to identify if any new grant opportunities have emerged. The Colorado Grants Guide is available online for a fee but can be accessed free at almost any public library.

- ✱ Initiate communication and collaboration between the EMS medical directors in Grand County. Enhanced cooperation between the medical directors will help to ensure care is provided consistent with community expectations everywhere in the county, enhance quality of medical direction through sharing of best practices and reduce duplicative efforts. Dr. Chew will be a valuable resource through his experience with the more collaborative medical direction programs in Boulder and Larimer Counties and the Northeast Colorado RETAC. Having EMS medical directors located on both sides of the Continental Divide creates some logistical challenges but it should be possible for this small group to equitably share the burden of travel or conducting meetings remotely.
- ✱ Increase participation in the Denver Metro EMS Physicians by Grand County EMS medical directors to develop a network of colleagues and make better use of resources offered by the Foothills RETAC regional medical direction program. This group will also help Grand County EMS medical directors keep current on advances in the EMS scope of practice, protocol development, new regulatory requirements, share his experience keep abreast of current trends occurring in surrounding counties and other topics.
- ✱ Include a local physician representative in EMS medical protocol development to ensure consistency with local medical care standards, compatibility with services available at local medical facilities, and serve as a liaison between the prehospital providers and the local medical community. Physician input from local receiving facilities is essential to create medical treatment protocols that are consistent with medical care standards in the community.
- ✱ Implement early dispatch of air medical for critical patients or patients likely to require a higher level of care. This should include dispatch directly to the scene in circumstances such as motor vehicle crashes with significant mechanism or cardiac chest pain, especially in the less accessible parts of the county. Early dispatch to a facility when patients are identified as having a time-sensitive condition requiring tertiary care such as multi-system trauma patients, STEMI and strokes should be addressed as well.
- ✱ All emergency medical and trauma services organizations in Grand County should use a standard protocol for activation of air medical services and provide consistent training for its application. The activation protocol should clearly identify the agency responsible for making the request and review each activation for appropriate utilization by a multidisciplinary team through a joint quality management process. The regional medical direction program for the Foothills RETAC can provide technical assistance with development of protocols designed for the benefit of patients, based on the circumstances specific to Grand County.
- ✱ Review scheduled emergency medical and trauma services education and evaluate opportunities for funding assistance. Make use of resources from the Colorado Rural Health Center and Foothills RETAC to help identify grants and scholarships available to providers serving Grand County.
- ✱ Continue to promote at least the following clinical skills:
 - Community CPR, AED and basic first aid training
 - CPR, AED and basic first aid for school employees, coaches and law enforcement
 - Early CPR, AED and basic first aid for high school students
- ✱ As soon as is reasonable, be sure that all stakeholders understand and agree upon their roles will be in the event of active shooter incidents within Grand County. Remove all assumptions and work to provide position-specific training that fits within a targeted hybrid

violence subsection of the county mass casualty plan. This topic is worthy of separate training aside from standard mass casualty planning.

- ✱ Formally establish and utilize cohesive, consistent command structure for response to EMS incidents in Grand County and clearly define the chain of command, roles and responsibilities to create reasonable expectations for each agency that is called to respond. All response agencies (law enforcement, fire services, EMS, search and rescue, etc.) should utilize the formal command system when responding to incidents and conduct all radio traffic on the channels assigned for the incident to maintain situational awareness for all responders.
- ✱ Coordinate all requests for prehospital air medical services or other resources based outside the county through the Grand County Communications Center on the appropriate communications channel for the incident. The closest available air medical service licensed by the State of Colorado should be dispatched for patients airlifted directly from an incident scene. For incidents under jurisdiction of the National Park Service, the current practice that all requests for air medical services must be initiated by the appropriate park personnel on the radio channel for the incident in accordance with federal requirements must be continued.
- ✱ All facilities that provide on-line medical direction or receive patients from any EMS agency should have convenient access to the current medical treatment protocols and the physicians should be familiar with the scope of practice for the local EMS providers. Every EMS agency should maintain copies of the most current medical treatment protocols at each facility that provides them with on-line medical direction or receives patients, and their medical director should educate the physicians at the facility to help them faithfully comply with the standards of care expected by the medical director. For example, Grand County EMS should supply and maintain copies of the most current medical treatment protocols at East Grand Medical Center, Middle Park Medical Center-Granby and Middle Park Medical Center-Kremmling and Dr. Nichols should provide ongoing education for the physicians at these three facilities.
- ✱ Initiate communication and collaboration between the EMS medical directors in Grand County. Enhanced cooperation between the medical directors will help to ensure care is provided consistent with community expectations everywhere in the county, enhance quality of medical direction through sharing of best practices and reduce duplicative efforts. The geographic dispersion of the EMS medical directors across both sides of the Continental Divide, combined with closure of the Trail Ridge Road for much of the year, creates some logistical challenges but it should not be too difficult to equitably share the burden of travel or conducting meetings remotely for this small group. Dr. Chew is a valuable resource through his experience with the more collaborative medical direction programs in Boulder and Larimer Counties and the Northeast Colorado RETAC and will complement the capabilities of the medical directors on the western side of the divide.
- ✱ Facilitate communications with local physicians, and ensure EMS protocols are consistent with local medical care standards and capabilities of local medical facilities by recruiting a local physician to serve as an assistant EMS medical director for Grand County EMS. The assistant EMS medical director can also provide outreach to increase knowledge of the EMS protocols for physicians who provide on-line medical direction for the EMS providers in the field and build collaboration and communication among the local medical community.

Medium-term (3 to 5 years)

- ✱ Each special district providing emergency medical and trauma services in Grand County should review its service plan, update if indicated and file the revised service plan with the Colorado Department of Local Affairs. Although the services currently offered are authorized by statute, a plan that addresses all current and future services will increase transparency for this level of government and enhance reimbursement if district resources are ever called to assist with a declared federal disaster.
- ✱ Unify medical treatment protocols for all agencies in Grand County. Standard, countywide protocols provide a number of benefits. First and foremost, they establish a uniform standard of care for all patients encountered by EMS, regardless of provider, that is consistent with the expectations of the local health care community. The majority of EMS protocols are developed based on the scope of practice for EMS providers as established by regulation and share common elements. Standardizing protocols that comprise the core of EMS practice reduces the amount of time each individual agency medical director must devote to protocol development. Consistent protocols also simplify on-line medical direction. The physician in contact with EMS providers in the field only has to be familiar with one set of protocols to provide sound advice consistent with EMS scope of practice and the principles of patient care established by the agency medical director.
- ✱ Establish a forum for collaboration among the agencies in Grand County for EMS medical direction to facilitate peer communication, provide resources to help agency medical directors, facilitate local EMS quality management activities, promote standardization of protocols for consistent levels of service and training for EMS providers and facilitate communications with the local health care community.
- ✱ Develop a common set of medical treatment protocols for use by all emergency medical response agencies in Grand County. Common medical treatment protocols for all levels of EMS providers at all of the agencies in Grand County are critical to ensure all patients receive high-quality care.
- ✱ Develop a local EMS Education Committee to regularly conduct needs assessments and collaboratively address education challenges. The committee should work to improve coordination of trainings to maximize cost efficiencies, avoid duplication of efforts, and increase communication, trust and agency cooperation and seek grants to assist with funding for initial and continuing education needs. Consider including the Grand County EMS training captain, an EMS medical director, a fire service representative, a ski patrol representative, education coordinators from area hospitals and the Foothills RETAC.
- ✱ Develop relationships and clinical agreements to use emergency department rotations as an educational tool to help familiarize practitioners with current skill levels and identify future continuing education needs, help EMS personnel gain experience in vital competencies such as patient assessments and venous access.
- ✱ Engage air medical services as part of the overall EMS education program. Personnel from the full range of emergency medical and trauma services organizations should undergo the helicopter safety training and periodically refresh this education. These agencies have offered to participate as much as possible and have outreach education budgets to be a helpful education resource.
- ✱ Pediatric hospitals, trauma key resource facilities, comprehensive stroke centers and other specialty services include outreach education as an integral part of their mission. Involve

these resources in the overall EMS education program. Exposure to instructors from other EMS outreach programs helps to avoid an insular internal education system.

- ✱ Consider using online educational offerings. High quality online continuing education can be found through hospital system outreach programs, as well as contracted through several national providers and can fill gaps in areas where essential continuing education is not available locally.
- ✱ Continue to develop the use of high-fidelity EMS training mannequins for in-house education. These have had good early scientific support for the maintenance of clinical skills in the absence of patient contact volume and can often be acquired with the assistance of grant funding. Additionally, positive outcomes are also being shown with reality-based training scenarios, which can also be a great method to engage multiple agencies in real-time exercises. Educational content that makes use of high-fidelity EMS training mannequins can be accessed through state-recognized EMS education programs operated by the air medical services and hospitals on the Front Range. There are also two mobile pediatric simulation labs based in the Denver metropolitan area that can bring this resource to Grand County for a modest fee.
- ✱ Link continuing education programs to the quality management process. The existing continuing education processes appear to cover the requirements to maintain credentials but connecting the two processes will advance the agencies to the next level where education can reinforce existing strengths and bolster identified weaknesses in the system as well as for individual providers. This is particularly important for advanced-level providers who may be performing higher-level skills infrequently based on the relatively low volume of patient contacts.
- ✱ Stakeholders should keep abreast with development of the FirstNet public safety mobile network and trial new devices or services as they become available to determine if they enhance communications capabilities.
- ✱ Collaborate with Rocky Mountain National Park to develop and implement a public information campaign utilizing local media, resort information television, trailhead signage and web-based media to educate the public about the shortcomings of wireless telephone service to access 911 in remote locations and throughout the park. This message has widespread applicability and may benefit from collaboration with provider agencies on both sides of the Continental Divide.
- ✱ Acknowledge public education as a critical activity. All emergency medical and trauma services stakeholders should collaborate with other community resources to determine needs and explore methods to fund and implement public education initiatives. Work collaboratively with the Foothills RETAC to develop a solid community-wide public education plan that includes clinical education, program marketing, system access awareness and prevention and considers the needs of all members of the community including school-age children, adults, senior citizens, and other members of the community with special needs.
- ✱ Routinely evaluate the effectiveness of the public education program and identify new opportunities.
- ✱ Make a commitment to engage in community-wide, multi-disciplinary illness and injury prevention activities. Prevention should be recognized as not only a method to improve the health and safety of the community, but as an avenue to connect with the community in a mutually beneficial manner.

- ✱ Engage the Foothills RETAC Injury Prevention Committee, Grand County Public Health or other sources to conduct a community needs assessment. Use surveys, trauma incidence data from the medical facilities and other sources to identify problems or areas of interest to the community. Collaborate with designated trauma centers, EMS, fire services, public health, schools and other stakeholders to develop a specific, achievable prevention plan to address identified community needs.
- ✱ Consider increasing the number of car seat technicians in Grand County. Engage medical facilities, EMS, fire services, law enforcement and public health to commit more staff training to this program.
- ✱ Continue the excellent work building a heart-safe community:
 - Seek additional funding to place more AEDs and develop a method to identify target locations.
 - Engage the communications center on AED locating procedures, or use an automated program, during reported sudden cardiac arrest events to assure nearby AEDs are brought to a sudden cardiac arrest as quickly as possible.
 - Commit to training more community members in CPR and AED use, and develop a multi-agency approach to holding classes for the community.
 - Assist businesses and other community AED sites to have emergency response plans and targeted users.
 - Conduct public awareness campaigns on heart attack recognition, early access, and community AED program information.
- ✱ Consider exploring the use of multiple social media platforms. Each platform (twitter, Instagram, snap-chat, Pinterest, etc.) opens the user up to different audiences with differing interests and perspectives. Do not be discouraged if there is limited interaction initially. Even if people are not specifically interacting, pressing icons and commenting on posts, that does not mean they are not looking at the content and receiving the messages. Social media is a great avenue for education and outreach to constituents of all ages, interests and backgrounds.
- ✱ It is becoming increasingly common that emergency responders of all disciplines are becoming the target of unprovoked violence. Issuing tourniquets to all EMS personnel to be worn as part of their uniform is a relatively inexpensive measure to improve personal safety in the event that they or their partner are caught up in circumstances in which they are injured before having the opportunity to seek cover or escape.
- ✱ Consider development of a county quality management group to provide a forum for protected case review, provider feedback and loop closure of system or clinical care issues. Collaborate with all agencies and organizations involved in a case to review the patient care reports for proper assessment, treatment and transport from the 911 call through final patient disposition.
- ✱ Review agency quality management programs to ensure they reflect the most current research, best practices and thoroughly assess system and individual performance. Update all prehospital quality management programs to incorporate the components required to invoke the protections enacted by the Colorado legislature in 2014 to place them on equal footing with the quality management programs used by other health care providers.
- ✱ Create a reliable, efficient system to provide a dashboard view of the EMS system focused on positive patient outcome. The dashboard should be self-reporting and assessing with the capability to modify resources and trainings based upon periodic evaluation of data.

Develop system performance measures using consistent definitions to ensure citizens and visitors receive reasonable access to prehospital emergency care based upon realistic expectations geographically throughout the county. After priority dispatch protocols are implemented, it may be appropriate to establish call-time performance standards. The response zones and time standards should be evaluated on an annual basis to ensure the criteria is reasonable, attainable and EMS care is being delivered with increased positive outcomes. System performance measures should be based upon a specific percentile to mitigate the effect of statistical challenges inherent to small populations in the context of emergency responses in rural and frontier areas.

Long-term (5 years)

- ✱ The EMS medical directors in Grand County have been generous with their time to serve the community by supervising the EMS providers. However, they should consider further formal training, when possible, such as completion of an EMS Medical Directors training course through the American College of Emergency Physicians, attendance at the Medical Director's Forum at the state EMS conference or other programs to build the skills to effectively provide EMS medical oversight.
- ✱ None of the EMS medical directors in Grand County receives compensation for services. If the current model for medical direction is continued, the EMS community should consider some type of financial stipend. The physicians currently providing medical direction have very busy practices without their EMS responsibilities and a stipend may compensate them for their commitment or least convey gratitude for the time they devote to EMS. Furthermore, the lack of a stipend to provide local medical direction could potentially create significant issues when an agency is faced with a transition of medical direction or an urgent need to find a successor or replacement medical director. Compensation for EMS medical direction helps to ensure long-term sustainability for this essential component.
- ✱ As more emergency medical and trauma services organizations implement electronic record systems, consider establishing links between the systems to share data across the spectrum of patient care to monitor the quality of care for individual patients or combine to assess any aspect of system performance, and reduce duplicative data entry.
- ✱ Continue building on the community's knowledge about the EMS system and engage in continuous efforts to educate the public.
- ✱ Conduct ongoing research to identify meaningful benchmarks that can be used to compare performance of the Grand County emergency medical and trauma services system with similar systems across the country.
- ✱ Some areas of conflict between Middle Park Medical Center and Grand County EMS arise from the misunderstanding of each other's capabilities and protocols, and detracts from optimum patient care by all providers. The hospitals and ambulance service must encourage and accept input from one another to coordinate appropriate treatment and transport policies, procedures and protocols that integrate facility and EMS capabilities. The current system does not appear to solicit or accept input from medical directors outside of Grand County. All emergency medical and trauma services organizations must actively seek external peer-supported research to ensure that medical treatment protocols are meeting current national and state standards of care. This is important to integrate treatment protocols involving patient transfers to Front Range and other regional hospitals.

Appendix A: Grand County EMS Statistics 2017

These statistics are compiled from data submitted to the state for NEMSIS reporting

Response Requests

Response Requests	# of Times	% of Times
911 Response (Scene)	1295	59.8%
Interfacility Transfer (Scheduled)	670	30.9%
Standby	168	7.8%
Mutual Aid	31	1.4%
Intercept	2	0.1%
Unknown	0	0.0%
Total	2166	100%

Request for Service Time Frames

Time Period	Sunday	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Total	%
00:00 - 03:00	23	15	11	10	14	17	29	119	5.5%
03:00 - 06:00	11	10	9	4	12	13	14	73	3.4%
06:00 - 09:00	34	23	25	28	30	18	28	186	8.6%
09:00 - 12:00	38	34	43	45	39	49	61	309	14.3%
12:00 - 15:00	55	56	53	50	49	77	99	439	20.3%
15:00 - 18:00	53	41	60	54	51	69	82	410	18.9%
18:00 - 21:00	41	45	32	57	51	70	72	368	17.0%
21:00 - 24:00	39	35	25	39	31	36	57	262	12.1%
Unknown	0	0	0	0	0	0	0	0	0.0%
Total	294	259	258	287	277	349	442	2166	100%

Response Mode

Response Mode to Scene	# of Times	% of Times
Lights and Sirens	1053	48.6%
No Lights and Sirens	1015	46.9%
Initial Lights and Sirens, Downgraded to No Lights or Sirens	55	2.5%
Initial No Lights or Sirens, Upgraded to Lights and Sirens	43	2.0%
Unknown	0	0.0%
Total	2166	100.0%

Transport Mode

Transport Mode from Scene	# of Times	% of Times
No Lights or Sirens	1262	58.26%
Not Recorded	813	37.53%
Lights and Sirens	81	3.74%
Initial No Lights or Sirens, Upgraded to Lights and Sirens	10	0.46%
Unknown	0	0.00%
Total	2166	100.00%

Disposition

Response Disposition	# of Times	% of Times
Treated, Transported by EMS	1353	62.5%
No Treatment Required	294	13.6%
No Patient Found	284	13.1%
Cancelled	130	6.0%
Treated and Released	51	2.4%
Treated, Transferred Care	28	1.3%
Dead at Scene	10	0.5%
Treated, Transported by Private Vehicle	10	0.5%
Treated, Transported by Law Enforcement	6	0.3%
Unknown	0	0.0%
Total	2166	100%

Run Times

Enroute (Responding - Unit Notified Dispatched)		
Minutes	# of Runs	% of Runs
0 - 1	1222	56.4%
2 - 3	482	22.3%
4 - 5	145	6.7%
> 5	317	14.6%
Unknown	0	0.0%
Total	2166	100.0%

Response Time (Enroute - Arrive Scene)		
Minutes	# of Runs	% of Runs
0 - 5	749	34.6%
6 - 10	372	17.2%
11 - 15	251	11.6%
> 15	380	17.5%
Unknown	414	19.1%
Total	2166	100.0%

Transport Time (Depart Scene - Arrive Hospital)		
Minutes	# of Runs	% of Runs
0 - 5	147	6.8%
6 - 10	103	4.8%
11 - 14	115	5.3%
> 15	988	45.6%
Unknown	813	37.5%
Total	2166	100.0%

Average Run Times	
Enroute	0:04:50
To Scene	0:10:30
At Scene	0:30:17
To Destination	0:57:56
Back in Service	0:48:28
Total	2:32:01

Appendix B: List of Stakeholders Interviewed

Classic Air Medical

Denver Health East Grand Medical Center

Flight for Life-Colorado

Foothills RETAC

Grand County Board of Commissioners

Grand County Communications Center

Grand County Coroner's Office

Grand County Emergency Management

Grand County EMS

Grand County Search and Rescue

Grand County Sheriff's Office

Local Emergency Planning Committee

Middle Park Medical Center

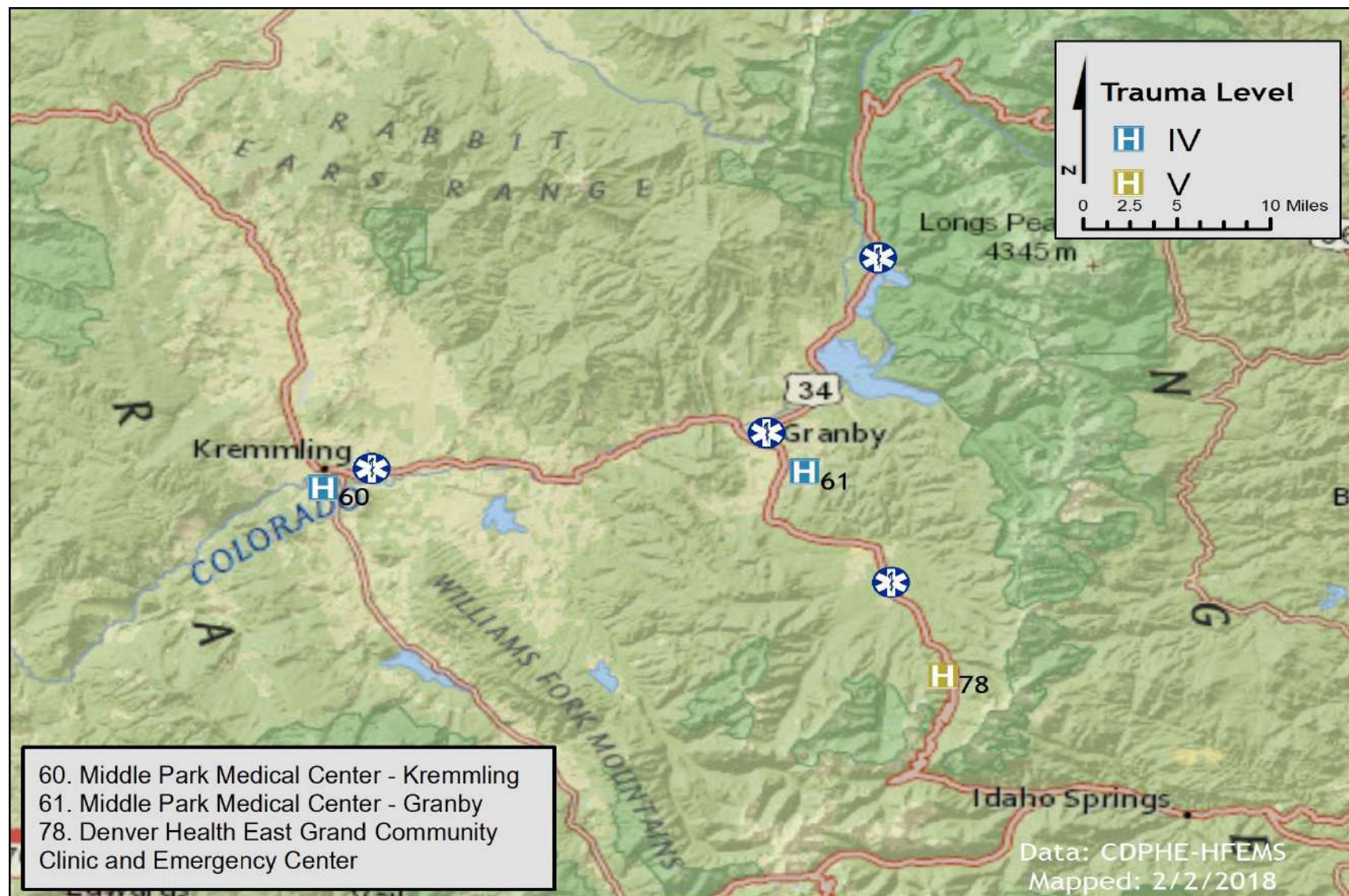
North Colorado Med Evac

Rocky Mountain National Park

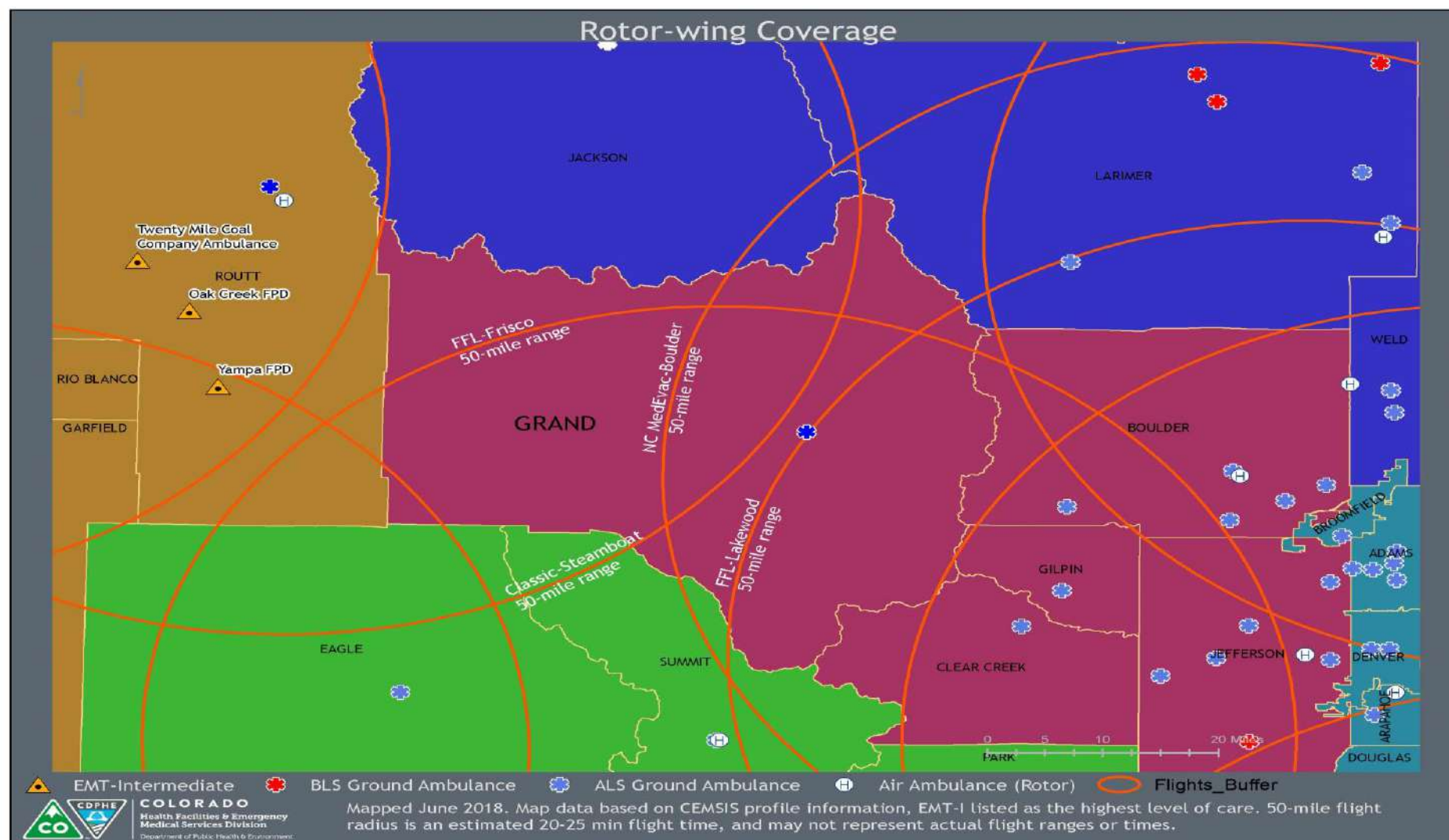
Ski Granby Ranch Ski Patrol

Winter Park Ski Patrol

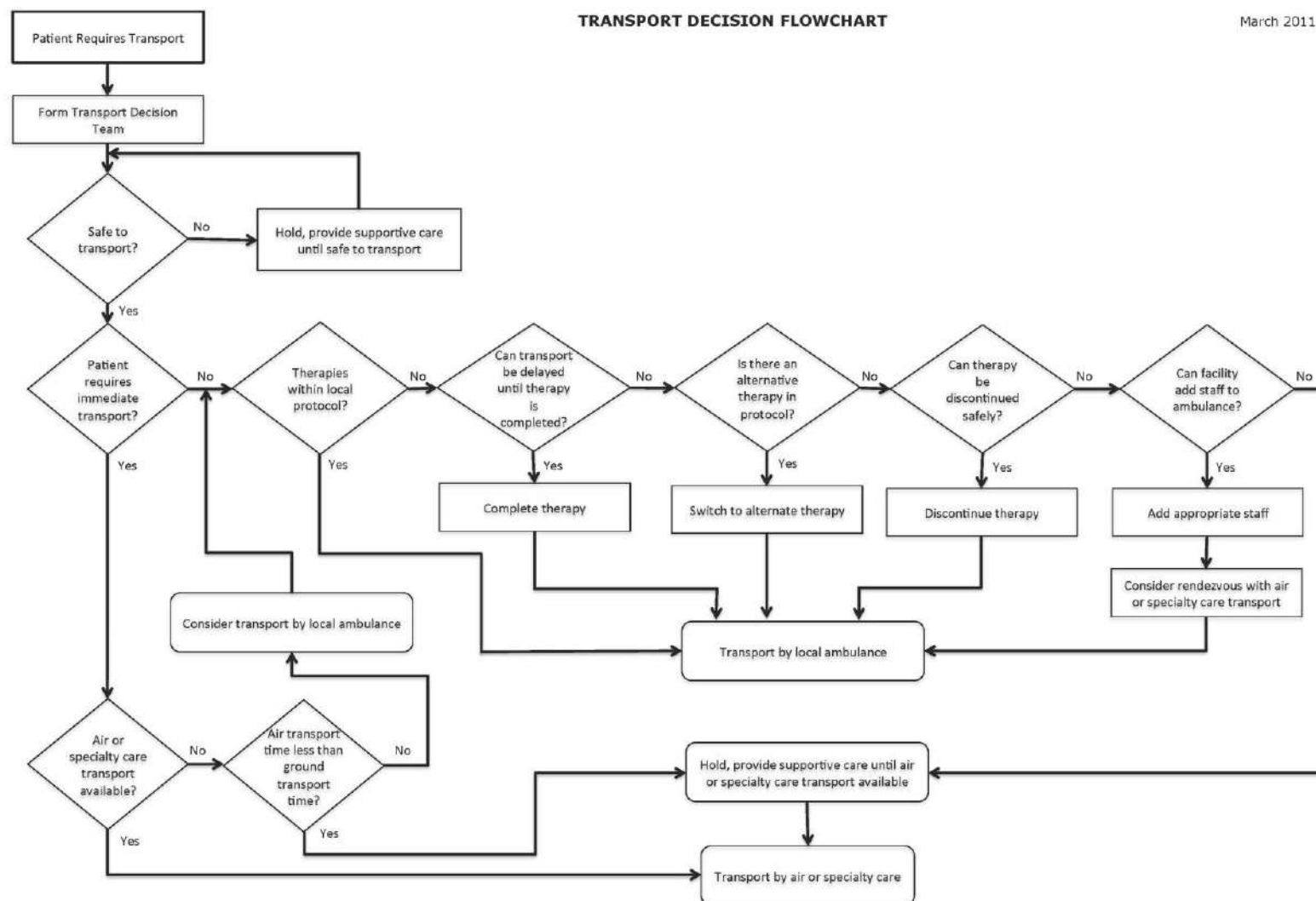
Appendix C: Grand County Service Map



Appendix D: Air Medical Coverage Map



Appendix E: Interfacility Transport Flow Chart



Notes for Transport Decision Flow Chart

March 2011

Transport Decision Team:

Participative, multidisciplinary group

Uses the "all to go, one to say no" safety philosophy from the air medical transport industry

Involves the ambulance service, air medical or specialty transport provider early to effect timely notification of resources

Includes:

- Originating physician
- House Supervisor, Charge Nurse or local facility equivalent
- Ambulance Supervisor or local agency equivalent
- Air medical or specialty care transport provider
- Accepting physician
- Any other facility-specific administrative or supervisory personnel

Considerations for Safe Transport:

Availability of appropriate transport staff

Presence of adverse weather conditions, road closures, construction, traffic delays or other hazards on transport route

Time of day and influence on transport crew, wildlife activity or other factors

Potential for patient condition to deteriorate and ability to provide foreseeable treatments in transport vehicle

Transport Priorities:

Immediate:

- Patient immediately requires therapies that cannot be administered at the originating facility to preserve life or prevent disability. Patient may have unstable vital signs, require advanced invasive medical procedures or cannot be managed effectively at the originating facility.
- Transport is time sensitive and must be initiated as soon as possible.

Urgent:

- Patient requires therapies that cannot be administered at the originating facility. Patient may require advanced invasive medical procedures but they can be managed effectively at the originating facility until the patient is transported.
- Transport is not time sensitive and may be initiated in the next several hours.

Scheduled:

- Patient requires scheduled therapies that cannot be administered at the originating facility.
- Transport can be scheduled in advance to accommodate the patient, originating facility, ambulance service and destination.

Considerations for House Supervisor, Charge Nurse or local facility equivalent:

Current facility resources

Availability of trained facility personnel to participate in transport

Comfort level of facility personnel with specific patient

Time required to backfill if facility personnel participate in transport

Considerations for Ambulance Supervisor or local agency equivalent:

Therapies within scope of practice of available crew/possible alternative therapies

Comfort level of ambulance personnel with specific patient

Availability of other units or time required to backfill and provide 911 coverage while transport unit is out of service area

Availability of suitable transport vehicle with inverter or other special equipment and adequate payload to accommodate additional crew

Presence of adverse conditions or other hazards on transport route

Transport priority (Immediate, Urgent, Scheduled; An immediate priority interfacility transport has the same priority as a 911 call).

Considerations for facilities in the development of protocols or operating procedures:

- The capabilities of the facility and ambulance service should be considered but the well being of the patient is paramount
- The level of patient care and monitoring initiated in the clinical setting should be maintained during interfacility transport.
- Facility personnel will demonstrate current orientation by completing essential item check-off before transport commences. The original completed check-off sheet will be returned to the House Supervisor, Charge Nurse or local facility equivalent and maintained in conformance with facility-defined requirements.
- Facility personnel will be present in the ambulance patient compartment for the duration of the transport to provide patient care in cooperation with ambulance personnel.
- Establish clearly defined responsibility for patient care and authority for treatment decisions that articulate with ambulance service protocols or operating procedures.
- The originating physician will be responsible for continuing medical direction of patient care until patient care is transferred to the receiving facility.
- The originating facility will conduct an appropriate quality assurance review for each interfacility transfer where facility personnel were needed to supplement the ambulance crew. The review should include the originating physician, House Supervisor, Charge Nurse or local facility equivalent, facility personnel who provided care during transport, ambulance medical director, ambulance service director, supervisor or local agency equivalent, and ambulance crew.

Considerations for ambulance services in the development of protocols or operating procedures:

- The capabilities of the ambulance service and facility should be considered but the well being of the patient is paramount.
- The level of patient care and monitoring initiated in the clinical setting should be maintained during interfacility transport.
- Ambulance personnel will ensure current orientation of facility personnel by assisting with completion of the essential item check-off before transport commences.
- A qualified ambulance attendant will be present in the ambulance patient compartment for the duration of the transport to assist facility personnel and provide patient care.
- Establish clearly defined responsibility for patient care and authority for treatment decisions that articulate with protocols or operating procedures at the originating facility.
- The originating physician will be responsible for continuing medical direction of patient care until patient care is transferred to the receiving facility.
- The ambulance service will participate in quality assurance reviews conducted by the originating facility for each interfacility transfer where facility personnel were needed to supplement the ambulance crew. The review should include the originating physician, House Supervisor, Charge Nurse or local facility equivalent, facility personnel who provided care during transport, ambulance medical director, ambulance service director, supervisor or local agency equivalent, and ambulance crew.

Appendix F: Assessment Team Biographical Information

Carl Craigle, NR-Paramedic

Carl is a paramedic, leader, coach and educator with more than 30 years of field experience in EMS. He functions as the chief paramedic for Platte Valley Ambulance Service in Brighton, Colorado. While under his leadership, Platte Valley Ambulance Service received the Children's Hospital-Colorado Award for Commitment to Pediatric Emergency Care in 2015 and was awarded Ambulance Service of the Year in 2007. Platte Valley Ambulance Service is a hospital-based service providing both 911 response and interfacility transports for the citizens of Brighton, Lochbuie, Henderson, Todd Creek, Great Rock, Wattenburg and portions of unincorporated Adams and Weld Counties. Carl began his career in Philadelphia, PA over 25 years ago and found his way to Colorado working for Pridemark Paramedic Services. Throughout his career, Carl has focused on helping organizations improve system performance, build healthy cultures and increase safety for patients and providers.

Karl Gills, MHA

Karl earned a Bachelor of Science degree in Business Administration from the University of Denver and Master of Health Administration from The Ohio State University. He held various administrative positions at Iowa Methodist Medical Center in Des Moines from 1978 to 1986. During his tenure, Karl oversaw the implementation of a hospital based air medical helicopter program. Karl served as Chief Operating Officer at North Colorado Medical Center in Greeley, Colorado from 1986 to 1995 and as Administrator from 1995 to 2000. In 2001, he was appointed Chief Executive Officer at Yampa Valley Medical Center in Steamboat Springs and retired from this position in 2012. During his career, Karl has served on several boards and panels relating to hospitals and emergency services. He has been on the board of the Colorado Hospital Association, the Association of Hospital Based Emergency Air Medical Services (now AMTS), and the Commission on the Accreditation of Air Medical Services (now CAMTS). He has served on the Colorado State Emergency Medical Services Advisory Council, State Emergency Medical and Trauma Services Advisory Council and the Colorado Air Ambulance Task Force. Karl is currently a board member of the Steamboat Springs Area Fire Protection District.

Paul Mattson, Paramedic

Paul Mattson is a Colorado native. He moved to South Park in 1985 while working as a landscape artist showing his work in galleries throughout the western United States. In 1989 he became an EMT and was hired to manage the local non-profit volunteer ambulance system shortly after receiving his initial certification. In 1991 he worked with the community to form the South Park Ambulance District as a Title 32 Special District. The district has provided service with paid staff since January 1992. Paul

became an EMT-Intermediate in 1992 and a paramedic in 1998. The district, covering an area of almost 1,500 square miles, currently staffs two paramedic ambulance crews per shift. In addition to building the current system and overseeing all district operations, he has held numerous county-wide and regional emergency service positions. Due to his interest in emergency communications, he is a member of the Park County 911 Authority Board and the communications operations board. Paul still responds to calls as a paramedic.

Scott Sholes, BA, Paramedic

Scott began his career in EMS as an EMT with the prehospital program at Mercy Medical Center in Durango, Colorado in 1979. He has been active in both ground and aeromedical service as a paramedic. Currently Scott is the EMS Chief for Durango Fire Protection District, coordinating and advancing the EMS program. He is actively involved in EMS at the regional, state and national levels, and is particularly passionate about promoting a culture of safety. In 2009, he was selected to serve on the National Association of EMTs Safety Course Committee and participated in the development of the new certification course in EMS safety. His current service includes: Chair of the La Plata County Emergency Services Council; Chair of the Southwest Regional Emergency and Trauma Advisory Council; President of the Emergency Medical Services Association of Colorado; Vice President of the Colorado EMS Chiefs, Managers and Directors Association; President of Heart Safe La Plata.

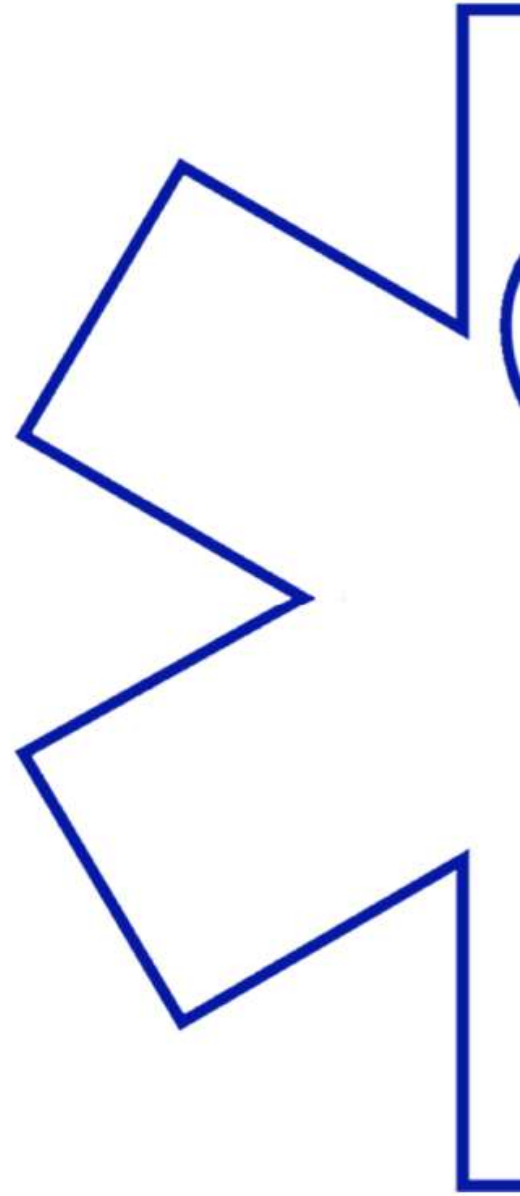
Jeff Beckman, MD, FACEP, EMS Diplomat

Dr. Beckman completed medical school in 1999 at Emory University where he served as class president and then spent time as a volunteer physician in Honduras and Nepal along with completion of residency training in Colorado at the Denver Health Residency in Emergency Medicine in 2003. He began attending clinical practice working as an emergency physician at Good Samaritan Medical Center and Lutheran Medical Center in 2004. Cultivating his interest in EMS, he began EMS Medical Direction of many agencies in the Denver Metro region balanced with his continued clinical practice in Emergency Medicine. Dr. Beckman's other adventures in medicine included teaching a wilderness medicine course in high altitude medicine at the base camp of Aconcagua, Argentina in January 2014. His endeavors in EMS were recognized with appointment to the State Emergency and Medical Advisory Council, to the Foothills Regional Emergency and Trauma Advisory Council by Jefferson County Commissioners, to the state Emergency Medical Practice Advisory Council, and being awarded the 2014 Dr. Valentin E. Wohlauer Award for Physician Excellence in EMS. Dr. Beckman is very interested with progressive patient care quality management and advancing regional EMS and trauma care as both an EMS agency medical director and through leadership in state advisory councils. This passion has led him to become specialty board certified in EMS and selection as the Health Facilities and EMS Medical Director for the Colorado Department of Public Health and Environment in mid-2016 which he continues in this capacity today. In addition to his duties with the state, he enjoys continued clinical

practice as an Emergency Medicine physician with US Acute Care Solutions and EMS medical director for Arvada Fire Department, Thornton Fire Department, and iCare Ambulance. In time away from work, Dr. Beckman enjoys telemark skiing, triathlon racing, mountaineering, mountain biking, and mostly feels blessed in the journey of raising two energetic boys with his wife.

Eric Schmidt, RN, BSN, MBA, EMT-Intermediate

Eric is a Colorado native and began his career in emergency services more than 40 years ago after a call to the community for volunteers to fight a wildland fire southwest of Boulder. He is currently the funding section manager at the Colorado Department of Public Health and Environment, Emergency Medical and Trauma Services Branch. He has provided EMS consulting services, technical assistance to local governments and ambulance inspection services for ten counties in Colorado through his firm, EMS Services, since 1992. Eric has a broad array of experiences in emergency medical and trauma services. He contracted with the Northwest RETAC to serve as regional coordinator, was a trauma nurse coordinator for Penrose Hospital, a Level II trauma center in Colorado Springs, and served as the EMS Officer for El Paso County where his duties included management of a high performance ambulance contract for the El Paso County Emergency Services Agency, administration of the county's ambulance licensing program and EMS system coordination. He has also served as the manager for Upper San Juan Hospital District, a Title 32 special district that operated an ambulance service and built a community clinic and emergency center during his tenure, directed the EMS training program for Colorado Northwestern Community College, administered federal pass-through grants as a program manager for the Colorado Department of Transportation, collected prehospital data for system analysis as an information system specialist at the Colorado Department of Public Health and Environment, held paid and volunteer positions as an EMT at several rural EMS agencies and served as a volunteer firefighter in Colorado and Wyoming. He earned Bachelor of Science degrees in Nursing, Business Administration and Mechanical Engineering from the University of Colorado, and a Master of Business Administration from the University of Oregon. Eric currently holds a Colorado Registered Nurse license, Colorado EMT-Intermediate certification and a technician level Amateur Radio license from the Federal Communications Commission.



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