**A LIFE AND DEATH MATTER:**
**EVALUATION OF A TRAINING PROGRAM**
**FOR EMERGENCY MEDICAL SERVICES PROVIDERS**


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## Dedication

This research project is dedicated first to my parents for the tremendous outpouring of their love and support demonstrated to me not just now but over the course of my life. Thanks, Mom and Dad for helping to make me the person I am today.

Then, it is dedicated to my parents-in-law because words alone cannot express my appreciation to you for reminding me repeatedly of endless opportunities awaiting God's children. Thanks for your encouragement and support.

To my husband, Stafford, *you're the meaning in my life, you're my inspiration.* Thanks for being there for me at all times and for upholding me, emotionally, physically and spiritually, especially when the going got tough.

Finally, thanks to God my creator, whose promise was kept that- *If any of you lack wisdom, let him ask of God, that giveth to all men liberally, and upgradeth not; and it shall be given him  ( James 1:5).*

**Abstract**

**A Life and Death Matter: Evaluation of a Training Program**

**For Emergency Medical Services Providers**

The effectiveness of a legislated training program for emergency medical services (EMS) practitioners in Southern Alberta was evaluated in three communities.  The theoretical guide for the research was the Kirkpatrick Training Evaluation Model (1959; 1975; 1996; 1998), which evaluates training programs at four levels- reaction, learning, behavior and results. The research design involved analyses of patient care reports, and interviews with EMS practitioners, allied professionals and patients. Findings indicated positive outcomes at all four levels of the Kirkpatrick model.  The results indicated that the training program has resulted in improved EMS delivery by trainees who positively transferred newly acquired skills and knowledge. Accordingly, it was concluded that the legislated training standards have created positive outcomes, and it was recommended that funding for the training program should continue.  It was also concluded that the training program has helped to develop a positive learning environment in the three EMS agencies studied.

**Acknowledgements**

*"But because you can describe something does not mean that you can interpret it."*
*(Halcolm's Evaluation Koans)*

Completion of a Master's project is a challenging, intricate and exasperating process. Because it is so rewarding to finish, it would be remiss if I fail to acknowledge those who aided me along the way. I am first and foremost humbly indebted to my supervisor Dr. Bernard Williams for his instrumental guidance and much needed impetus as I journeyed, stage by stage, throughout the course of conducting my research. Many thanks Bernie for selflessly and successfully imparting to me the necessary skills with which I feel well equipped to face the future in the world of research.

My gratitude is also extended to my second reader Dr. Ali Dastmalchian for his willingness to provide me with useful feedback. With your keen insight and commitment, the quality of this research paper has been enhanced.

I would like to express my appreciation to the members of the Faculty of Management, for not only their unfaltering support but also their invaluable contribution. As experienced researchers, and more so, as individuals personally interested in commemorating the completion of my project, you have influenced the progress of my research project in ways too numerous to mention.

Last but in no way least, an extra special thank you is reserved for Dr. Robert T. Golembiewski, who assumed responsibility as my External Examiner. It has been a distinct pleasure to have you becoming engaged in my research.

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## List of Abbreviations

ALS: Advanced Life Support

BLS: Basic Life Support

BTLS: Basic Trauma Life Support

CHR: Chinook Health Region

EMR: Emergency Medical Responder

EMS: Emergency Medical Services

EMT: Emergency Medical Technician

EMT-A: Emergency Medical Technician- Ambulance

PCR: Patient Care Report

QA: Quality Assurance

QI: Quality Improvement

RHA: Regional Health Authority

SMEs: Subject Matter Experts

**Chapter One**

**Introduction**

This chapter explains the overall purpose and design of the project and highlights

the significance for human resource managers, training professionals, policy makers, and

administrators. It also discusses the study's problem, aim, and significance. Chapter two

is a comprehensive review of literature on training, evaluation and quality issues in

Emergency Medical Services (EMS). Chapter three entails a discourse on the research

design and research methodology. Chapters four and five discuss the results of the study,

conclusions, recommendations and suggestions for further study.

*Background to the Problem*

"Training programs are big business in terms of both the amount of effort

expended and the money spent" (Goldstein, 1993, p.4). Moreover, training is a "time-

consuming task that requires some very definite skills and experience" (Mohrman,

Resnick-West & Lawler, 1989, p. 157). It is therefore necessary for training programs to

be evaluated to determine effectiveness (Kirkpatrick, 1998).

Emergency medical services require initiation of training programs because of the

demand for unique knowledge and skills (Dernocoeur, 1998). The pre-hospital care

component of medicine is an area of health care that is encountering the most rapid

development (Lefurgey & Morrice, 2002), has undergone significant changes over the

years (MLA Review Team, 2001) and has become an integral component of front-line

health care (Cenaiko & Ouellette, 2002). In Alberta, this is attributable to transformations

in the health system to restructure, streamline and improve the efficiency and coordination of health services (CHRA Corporate, 1997).

In 1996, the Chinook Health Region (CHR) Committee was established to promote communication and collaboration between major stakeholders in the provision of ground ambulance services. Critical issues addressed included limited opportunities to maintain skills due to low call volume (less than six hundred emergency calls per year), limited local resources for skill upgrading and maintenance, and volunteer recruitment and retention (CHR Corporate Office, 2000).

Recommendations made in 1997 by the Ground Ambulance Task Force, led to the introduction of provincial legislation designed to increase the level of training and certification required to staff ambulances. Under the Ambulance Services Act of March 1998, each ambulance must have on board at least two practitioners registered with the Alberta College of Paramedics. Three levels of service are recognized - Emergency Medical Responder (EMR), Basic Life Support/Emergency Medical Technician-Ambulance (BLS/EMT-A), and Advanced Life Support (ALS), (MLA Review, 2001) (see Appendix A for more details). Changes in minimum expectations of care over time represent true progress of the overall EMS system (Wolff & Fleming, 1993); hence Basic Life Support (BLS) was established as the minimum level of ground ambulance service in Alberta (Cenaiko & Ouellette, 2002). Only in exceptional cases could the Minister of Health and Wellness permit operation of a lower level of service, and the EMS districts must have reasonable access to ALS. This suggests an increased labour demand in the EMS industry. Research in Alberta indicates that 129 respondents (licensed ambulance service providers) identified a need for 642 newly trained Emergency Medical

Technicians (EMTs) and 438 newly trained paramedics over the next five years (Seaman & Associates, 2001).

Feedback from various communities reported that ambulance operators with low call volumes are financially squeezed to the point where they cannot guarantee availability of basic ambulance services (Cenaiko & Ouellette, 2002). Cost can be a barrier to the access to educational programs (Kerns, 1994), so in 1998, Alberta Health and Wellness developed a program to provide funding to help defray costs associated with developing and/or retaining Basic Life Support care providers in the province.

Influenced by the CHR Regional Ambulance Committee of May 1996, some municipalities in Southern Alberta pooled their funds to develop a consolidated, regional training program in four (4) EMS training courses- Emergency Medical Responders (EMR); EMT-A; Enhanced EMT Skills (12-1 Skills); and Basic Trauma Life Support (BTLS). This venture seems highly successful from an administrative standpoint, however a systematic evaluation of the effectiveness of the training program has not yet been undertaken.

*Statement of the Problem*

In order to improve the quality of emergency medical treatment in the province of Alberta, the government has instituted policies regarding minimum standards of care, and has provided funding to help communities upgrade the level of training for local emergency medical service providers. The problem is that a systematic evaluation has not been conducted to ascertain if the funding invested in training is providing valuable outcomes and results. This lack of formal evaluation has far-reaching implications for

efficiency of resource use, quality of EMS service, and most importantly, the quality of

patient care.  An understanding of each of these areas can be greatly enhanced by a

systematic evaluation process (U.S. Department of Transportation, 1997).


*Purpose*

The purpose of this research project was to formally evaluate the effectiveness of

a training program funded by Alberta Health and Wellness involving the four EMS

courses (EMR, EMT-A, 12-1 Skills & BTLS). The aim of the project was to answer the

following research questions:

*Main research question.*

To what extent has the implementation of legislated training in EMS led to improved

outcomes in Southern Alberta?

*Subsidiary research questions.*

1. How applicable, valuable, and appropriate is the training to the participants, as

providers of emergency medical care?

2. To what extent have training participants acquired new skills, knowledge and increased

confidence as a result of the training?

3.  Has the training led to improved on-the-job performance by organizational members?

4. Has the training led to improved patient care and satisfaction?


*Research Strategy*

In answering the above research questions, a case study approach was taken using

the Kirkpatrick Training Evaluation Model (Kirkpatrick; 1959; 1975; 1996; 1998) as the

framework for evaluation. The research sites were three rural communities in Southern Alberta- Coaldale, Raymond and Pincher Creek, where the respective emergency medical services (EMS) departments participate in training courses funded by Alberta Health and Wellness. Primary data were collected using face-to-face and telephone interviews and a survey to verify findings from the interviews. Respondents included thirty-two (32) training participants, twenty (20) allied professionals and fifteen (15) patients. Secondary data were accessed through patient care reports (PCRs) and other call statistics recorded by Alberta Health and Wellness and the three local communities. These data were analyzed to evaluate trends in the number and types of patient treatments provided by emergency medical service providers in the three communities.

## *Significance of the Research*

Effectiveness is generally studied to enable management and service providers to make specific decisions about program change and eventually, decisions about service delivery methods (Love, 1991). This research has practical significance; it provides a systematic approach to evaluate training programs, most notably those in the EMS industry where ongoing training and evaluation are crucial. Municipalities, operators and practitioners face increased pressure to provide well-coordinated and responsive services due to technological advances and a rapidly growing population (increasingly aged and urbanized) with high expectations (Cenaiko & Ouellette, 2002; MLA Review, 2001) for improved health, improved quality and improved efficiency (U.S. Department of Transportation, 1997). Thus, in the move toward a patient-focused system (Cenaiko & Ouellette, 2002), timely and important data on actual patient care are collected for

planning and improving program operations, resulting in increased efficiency

(McDowell, 1993).

In addition, this project significantly enriches the current training evaluation

literature in two ways. First, on a broader level, it investigates the impact of the

formulation and implementation of training policy on specified emergency health

services. Training policy evaluation outcomes can result in major organizational changes,

and are critical to resource allocation (Long, 1990).  Secondly, and more specifically,

based on the Kirkpatrick model, this study examines a training program's effects on

participant's attitudes, skills, performance, and patient outcomes.  The results from the

communities being researched will provide a basis for other communities to use as

benchmarks to evaluate their own policies and performance (U.S. Department of

Transportation, 1997).

**Chapter Two**

**Review of Related Research and Literature**

*Introduction*

  Organized into themes and issues, this literature review, was enriched with information from various sources. In the incipient stage, the electronic databases at the University of Lethbridge and the National Emergency Training Center in Emmitsburg, Maryland were searched. Besides books, numerous articles were located in periodicals and trade journals, and were acquired electronically or through inter-library loans. Also, the collection of trade journals possessed by the Lethbridge Fire Department's Training Division was manually searched.

  Some limitations of the literature review have been identified. Firstly, the focus of some of the relevant journals concerns Emergency Medical Services (EMS) issues in metropolitan regions with higher call volume and more paid full-time personnel than the communities that were the focus of this research (Kuehl & Kerr, 1989). Therefore, though it is difficult to define EMS issues as rural or urban issues (Kerns, 1994), issues that may be unique to rural volunteer services may not have been addressed. Nevertheless, due to the rising trend towards professionalism, some issues identified, especially those pertaining to training effectiveness and quality service, are significant to both volunteer and career personnel.

  The second limitation was that several of the journals reviewed and articles identified are American in origin. Parallels exist in the organization and delivery of medical services in Canada and America, yet differences in areas like standards of care

and methods of funding cannot be overlooked. Thus, although much could be learned

from American literature, sensitivity to the subtle differences is needed. Finally, this

study focuses on BLS but much of the literature reviewed addresses concerns related to

paramedics (ALS). Nonetheless, as concepts and principles in EMS are transferable, this

information is also relevant to the BLS level of EMS.

*EMS: An Overview*

"Emergency Medical Services (EMS) is the practice of the evaluation and

management of patients with acute traumatic and medical conditions in the out-of-

hospital environment" (Fowler, 1994). With its modern era in North America beginning

in the 1970s (Page, 1994), the common goal of EMS is the reduction of unnecessary

morbidity and mortality (U.S. Department of Transportation, 1997). Pre-hospital

emergency care deals with service elements (e.g., accessing the system, first-aid &

transportation) needed to prevent the patient's condition from deteriorating after

untoward incidents (Minister of Supplies and Services, 1985).

*Ambulance Services in Alberta*

Providers of ground ambulance services across Alberta vary: most are owned and

operated by municipalities, while others are operated by the private sector, volunteers,

Native bands and industrial firms (CHRA Corporate, 1997). Municipalities have

authority under the Municipal Government Act to establish ambulance services and

determine the level of service they provide. Thus, a municipal ambulance operation could

be established- either separately or combined with a fire department (typified by the three

communities being researched), or could be contracted with a Regional Health Authority (RHA) or a private company (Cenaiko & Ouellette, 2002). Alberta has 125 ground ambulance operators serving nearly 400 municipalities, 17 RHAs and two provincial boards (Cenaiko & Ouellette, 2002). Ambulance operators provide 200,000 ground ambulance trips each year in Alberta (MLA Review Team, 2001). Canadians financially support ambulance services through provincial and municipal taxes and the total reported cost for ambulance service in Alberta is $37 per capita (Cenaiko & Ouellette, 2002).

*Recruitment and Training of Volunteers*

*Use of volunteers in EMS.* While volunteers are more economically viable in providing support for a core of emergency medical care providers, in some communities they are the only option (Bernier, 1995). Volunteers are the backbone of rural fire and EMS organizations (Seaman & Associates, 2001; Irwin, 1999). In the CHR, Alberta, the area of research, volunteers (paid per call) provide a significant amount of EMS. All nineteen EMS providers in one of the communities being evaluated are volunteers; in another, only three of nineteen practitioners work full-time and; in the third, two of thirty-four personnel have full-time status, the rest are volunteers. Significant challenges in providing an effective and appropriate level of service to Albertans are geography, population, legislation, different governance models and availability of trained staff (MLA Review, 2001).

*Retaining EMS volunteers.* Volunteer squads have a high turnover rate for personnel (Cline, 1993). Training is often an investment in the long-term performance of

people (Willyerd, 1997); turnover means loss of experience, expended training and unmet potential (Bernier, 1995, Tritt, 1994). Retention of quality members is an important aspect of managing today's volunteer department (Halpin, 1998). Attrition rates are lowest at the EMR level as these providers tend to stay with their employer while advancing to EMT status (Seaman & Associates, 2001). Turnover rates increase at the EMT level, because over time, many leave to train as paramedics, yet, the attrition rates decline again for fully designated paramedics, though some paramedics may abandon rural and smaller urban areas for the metropolitan cities.

Volunteer EMS can retain their members by developing successful orientation programs and identifying what motivates individuals to join the organization and meet their needs and expectations (Steiner, 1997). Such programs for volunteers provide frequent and regular opportunities for training and motivating recruits; improve organizational productivity; reduce personnel turnover and associated costs; improve organizational morale; and foster teamwork and cooperation among recruits who work and train together (Steiner, 1997).

Lack of structured retention activities and/or commitment to retention efforts by organizational members and conflicts with jobs are factors responsible for fluctuations in the number of volunteers (Steiner, 1997). Bernier (1995) advocates that communication, accommodation, respect, praise, team spirit and most of all- the need for education help reduce volunteer turnover. He argues that adequate and easily accessible training opportunities lead to more competent patient care and increase the volunteer's confidence in the field. This confidence comes from both responding to calls and from ample training with much opportunity and scope for practice. To best serve their patients,

providers of EMS must keep their skills sharp and this may be only possible in low call

volume areas via regular training sessions.

Dougherty (1995) asserts that in a low call area, maintaining interest in what one

does is extremely important. Without this impetus, the provider's efforts at remaining

vigilant become difficult. According to Crager (1995),

> Low call volume leads to rustout of EMS volunteers and the inability to perform
> skills when needed. Making training better, more accessible and more uniform
> in content and quality increases the likelihood of attracting more rural residents
> to volunteer in their communities. (p.33)

An assistant training coordinator of EMS in Montana believes that well-organized

training helps to alleviate exasperation associated with long periods of inactivity

(Dougherty, 1995). Since March 1993, for instance, a mobile training unit in Texas

travels to remote areas where volunteers have problem accessing continuing education.

The program's administrator states, "our goal is to improve patient care through

education" (Crager, 1995, p.33). Volunteers should meet the same standards of training

and care as paid EMTs and need the same rules and regulations, the same procedures and

protocols and the same organization as paid services (Habben, 1997).

*Motivating EMS volunteers.* Motivation is some kind of inner feeling, energy, or

driving force inside our guts, that propels us to do our virtual best to achieve excellence

in whatever we do" (Puri, 1999, p.51). Motivators are intrinsic and lead to growth,

responsibility, and satisfaction, including achievement, recognition, advancement, growth

and development and the nature and type of work (Frederick Herzberg, as cited in Puri,

1999). Thus, to keep volunteers motivated, they must be granted the opportunity to

participate in problem solving and significant decision-making because personal, positive

motivators are powerful in the volunteer culture whereas negative motivators like pay

suspension, extra duties, and demotion are ineffective (Cline, 1993). Volunteer

opportunities should provide for both self-actualizing personal development and

meaningful service to the needs of others.

Areas of motivation for EMS providers include provision of high-quality patient

care, delivery of care under adversity, keeping abreast of changes in their field and

balancing the needs of their personal lives with the requirements of the job (Kanarian,

2001). Reward is a return for correct response to stimulus and includes non-monetary

rewards such as skill enhancement or opportunities to increase challenge. Participation in

meaningful training activities is hence an invaluable means of increasing motivation and

satisfaction of volunteer EMS personnel.

Furthermore, Baldwin and Magjuka (1997) affirm that the motivation of trainees

will be maximized to the extent that they have maximum confidence that they can learn

and transfer (self-efficacy, Bandura, 1997); and believe that there is some value, personal

or organizational, from learning and applying training content (valence, Bandura, 1997).

Student satisfaction with training depends on several components: participants must view

course content as relevant and interesting to keep their attention; and must be motivated

both personally and by employers (Bledsoe, 1999).

### Training

*Definition.* Viewed as a management tool (Nickols, 2000), training is a key

element in the success of any system (Tritt, 1994). Training is "the systematic acquisition

of skills, rules, concepts, or attitudes that result in improved performance in another environment" (Goldstein, 1993, p.3). Training programs aim to convey knowledge, attitudes or skills to trainees to facilitate more efficient performance of tasks or a constellation of tasks (their jobs) than is possible without introduction of the program (Goldstein, 1993). Hence, an important objective of this study is to identify whether the trainees are better equipped with necessary skills, attitudes and knowledge to do their jobs more effectively.

*Purpose.* Employee know-how or expertise is a strategic necessity because the new economy demands increased flexibility in production and service delivery, use of advanced technology, and increased responsiveness to customers' needs (Jacobs & Jones, 1995). Expertise is "what the most capable employees know and can do, training is the means of communicating that knowledge and skills to others" (Jacobs & Jones, 1995, p.11). The aim of training is therefore to transfer knowledge and skills taught in the class to behaviors back on the job (Chase, 1997). As a management tool, training has many purposes: promoting change; focusing energy on issues, developing skills, certifying and licensing (Nickols, 2000). Training is instrumental in tuning present skills or in learning new ones. According to the CHR Corporate Office (2000), the training program being evaluated should produce the following outcomes:

1. Skilled, knowledgeable and confident emergency personnel providing safe quality care.

2. Retention of enthusiastic volunteers/providers with minimal disruption to their daily responsibilities and commitments.

***The training process.*** During training, a cardinal rule is that the learner, the person on the receiving end of instruction, must become involved. Training can be seen as a closed system or cycle with logically interrelated phases in which evaluation provides for continual modification of the program (Goldstein, 1993; Goad, 1982). Goldstein (1993) stresses the role of instructional technology or the systematic development of programs in training and education. Instructional objectives are specified and the precisely controlled learning experiences created to achieve these objectives, criteria for performance and evaluative information. Useful feedback is necessary to continually modify the instructional process. Shown in Figure 1 below, the systems approach model has three phases, assessment, training and development, and evaluation and emphasizes the components and their interaction.

The assessment phase or assessment of instructional needs examines three areas. Information is provided to design the entire model and influences both training and evaluation. Here, organizational analysis looks at long and short-term organizational goals and expectations of the training program. Task analysis examines the jobs to be performed by trainees upon completion of the training program (Goldstein, 1993).

Finally, person analysis examines behaviors required for the job. Job requirements are translated into the human attributes necessary to perform the task. Also, an analysis of performance standards and capabilities of the target population is done to determine, for example, which necessary characteristics have been learned by prospective trainees. After training, participants should achieve behavioral objectives, which provided the input for the design of the training program and measures of success (Goldstein, 1993).

Needs Assessment       Training & Development        Evaluation        Training Goal

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                  ┌──────────────┐
              ┌──▶│ Assess       │
              │   │ instructional│
              │   │ needs        │
              │   └──────┬───────┘
              │          ▼
              │   ┌──────────────┐         ┌──────────────┐      ┌──────────────┐
              │   │ Derive       │────────▶│ Develop      │─────▶│ Training     │
              │   │ objectives   │         │ criteria     │      │ validity     │
              │   └──────┬───────┘         └──────────────┘      └──────────────┘
              │          ▼                                       ┌──────────────┐
              │   ┌──────────────┐                               │ Transfer     │
              │   │ Select       │                               │ validity     │
              │   │ training     │                               └──────────────┘
              │   │ media &      │                               ┌──────────────┐
              │   │ learning     │                               │ Intra-       │
              │   │ principles   │                               │ organizational│
              │   └──────┬───────┘                               │ validity     │
              │          ▼                                       └──────────────┘
              │   ┌──────────────┐         ┌──────────────┐      ┌──────────────┐
              │   │ Conduct      │────────▶│ Evaluate     │─────▶│ Interorganizat│
              │   │ training     │         │ training     │      │ ional        │
              │   └──────────────┘         └──────────────┘      │ validity     │
              │                                                  └──────────────┘
              └──────────────────────────────────────────────────────────
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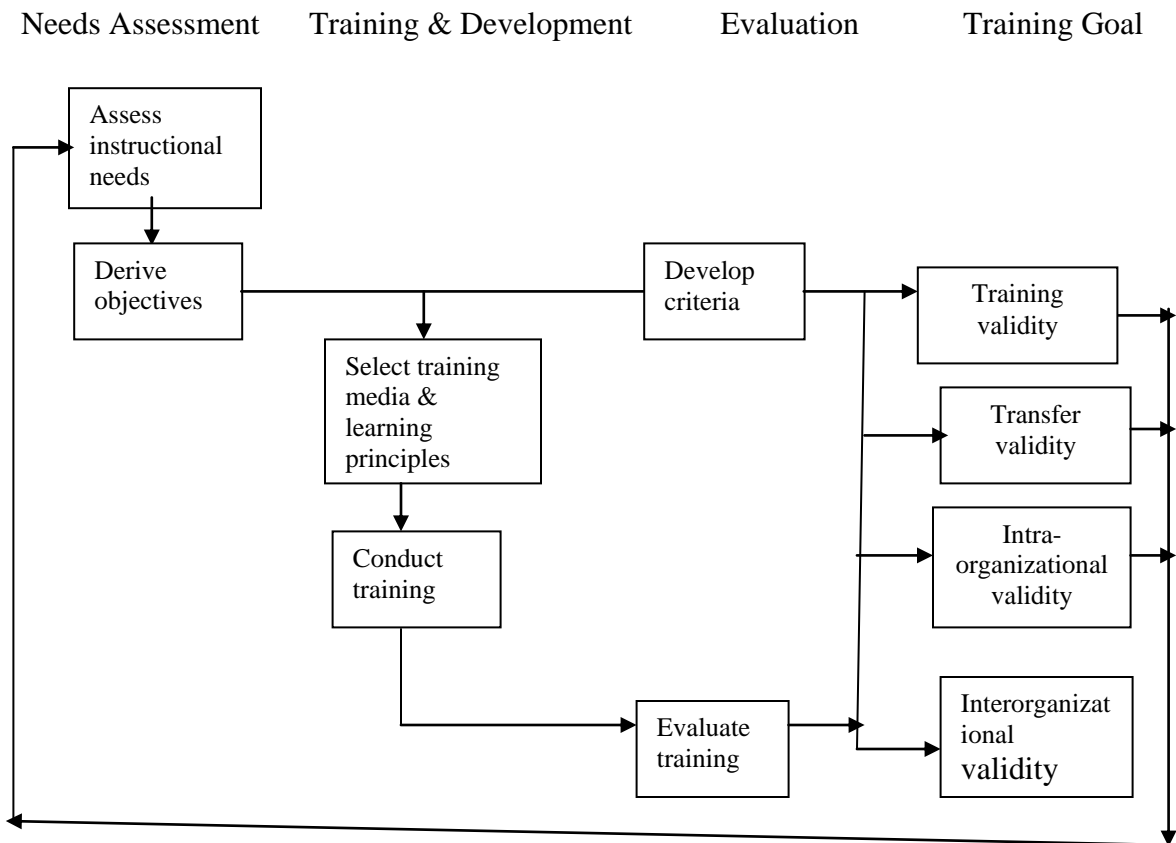
*Figure 1. The Instructional System Model. Source, Goldstein, 1993.*

The instructional system model shows that the objectives, criteria and design of

the program all stem from analyses of tasks, behaviors, and environments (Goldstein,

1993).  Characteristics of the group involved in the training environment should therefore

determine instructional programs. If intended for persons already on the job, data from

performance analysis and the specification of traits provide the required information for

an analysis of the target population. Characteristics of the target population must be

matched to traits required for successful performance. For instance, EMT instructors

must understand the different styles of adult learners - the reflective observer, the abstract

conceptualizer, the active experimenter, and the concrete experientialist (Grandey &

Margolis, 1998).

The training–development phase creates a proper training environment to achieve objectives by blending learning principles and media selection based on tasks that the trainee is eventually expected to perform.  Education is the cornerstone of system improvement (Polsky & Johnson, 1994) and is defined as "a long-term process which inspires a passion for continued learning and an ongoing mastery of diverse material" (Davis, 1998, p.45).

The evaluation phase involves two procedures - the establishment of measures of success (criteria) and the use of experimental and non-experimental designs to identify changes that occurred during the training and transfer process.  Criteria are based on the behavioral objectives determined by the assessment of instructional need. As standards of performance, these criteria should describe the behavior required to determine the trainees' skills, the conditions under which the trainees should perform and the lowest level of acceptable performance. Though all phases are crucial, this research is most concerned with evaluation.

Potential training goals include training validity which assesses learning by trainees during training. Transfer validity determines if this learning enhanced job performance.  Intraorganizational validity examines consistency in the performances of a new group of trainees and of the original training group in the same organization. Interorganizational validity deals with whether a training program validated in one organization can be successfully used in another organization.

*Training in EMS.* Prehospital care is an area of medicine that demands unique knowledge and skills (Dernocoeur, 1998); and most EMS education and training is

geared towards meeting clinical skills needs and certification requirements (U.S. Department of Transportation, 1997). Traditional EMS education focused on the cognitive knowledge of emergency pre-hospital medicine and the demonstration of certain selective psychomotor skills. EMS educators now need to consider a new philosophy regarding education and training whereby creative thinking and problem solving are employed (Davis, 1998).

This is distinguished from traditional active teaching (lecturing) and passive learning (taking notes and memorizing) components of EMS education by developing a classroom style that requires active learning. Learning means that a person has been exposed to material, can recall the data and understand the idea whereas knowing is the ability to process information, apply it to different situations than the one in which it was initially presented, and consider its meaning in contrast to other concepts (Davis, 1998). Research shows that training methods using cognitive modeling with practice and reinforcement generated significantly higher self-efficacy scores than a method involving only lecture and practice (Gist, 1989).

*New approaches to EMS training.* Syllabus development is essential in initiating the new approach to EMS training. Instead of using modules and units of information, which results in compartmentalization rather than integration of information, material should be organized to overlap, and reintroduced in the classroom when other concepts are presented (e.g., by integrating laboratory exercises with didactic material, Davis, 1998). Davis (1998) recommends practice scenario cases which foster learning efficiency and provide opportunities to evaluate students' progress. Students' confidence

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increases when they simulate responses to calls in the class with either successful

outcomes or constructive feedback about their performance- before making actual patient

contact. The very nature of EMS demands that trainees undergo simulation since the lives

of patients are at stake.   However, simulated or vestibule training takes place in well-

illuminated, distraction-free environments surrounded by all the right equipment,

displayed in clear view and within easy access, using uninjured patients.

The literature discusses a training course in cardiac problems that utilized

lectures, group discussions, workshops and practice sessions (Lacombe, Sanadi &

Browne, 1996). During case workshops, actual patients were profiled and participants

were involved in hands-on training whereby newly learned skills were combined with

infield experience. Teams of students were dispatched to mock scenes where actors

depicted the patient with the condition to be treated, providing some realism to the

training environment. Using a checklist as a guide to ensure that each patient was

evaluated in a standardized manner, other students evaluated. Special assessment forms

were used as information was collected about the rescuer's treatment of the patient. This

information was used during a debriefing when all aspects of the mock call were

reviewed. The debriefing was crucial in giving the participants an opportunity to discuss

important issues related to the case in a relaxed atmosphere. It was here that the strengths

and weaknesses of the rescue team's performance were pointed out.

Simulation in the classroom should be as close as possible to the true experience

to prepare the students to function with full responsibility for an actual patient (Porter,

1987).  Realism can be improved by moulaging of patients and props, working in dark

rooms, and turning off the heating or air condition to create adverse environmental

conditions. Porter (1987) establishes that traditional skill tests do not really examine the

field response. For instance, the environment is much less controlled because factors like

weather, lighting, noise, spatial constraints vary on each call but these are constant in the

classroom. Thus, EMS educators must pace the learning and gradually accustom students

to a realistic expectation of the role, responsibility and conditions of performance, which

represent pre-hospital emergency medical care.

*Skills emphasized in EMS training.* Researchers asked respondents to rank 21

skills taught in initial training or during ongoing education and found that most EMS

personnel ranked all the skills higher than or equal to the emphasis placed on them during

initial training (Brown, Pollock & Dunn, 1995). Therefore, while EMS personnel should

be involved in the revision of training programs, the ultimate program must be

educationally sound and based on a solid foundation of BLS skills and around the

concept of assessment. This is highlighted as the results indicated that assessment ranked

third behind endotracheal intubation and defibrillation, but this does not reflect reality

because assessments must be done before patients are treated (Brown, Pollock & Dunn,

1995). Patient assessment is one of the most important skills and requires a basic

understanding of anatomy and physiology.

Dernocoeur (1998) distinguishes between 'what-driven' and 'why- driven'

paramedics. The 'why' paramedic goes further than the 'what' paramedic and asks why

patients with particular problems present the way they do and why treatments help the

patient. He or she is more motivated to study the basis of all assessment and care-

anatomy and physiology. This basic science education opens opportunities for pre-hospital care personnel to become recognized as full-fledged medical professionals.

Increased responsibility in most communities has created a greater need for programs that stress teaching providers to analyze, interpret and evaluate any given situation. The EMS provider's critical thinking process is "the investigation of a situation, phenomenon or problem that involves the use of facts, principles, theories, abstractions, deductions and interpretations to arrive at a conclusion that can be evaluated, justified and critiqued" (Janing, 1995, p. 93). The key elements include the collection of data (vital signs, mechanism of injury or symptoms); interpretation of data through a filter of known concepts; application of basic principles to reach a conclusion and institute treatment; and an evaluation of the process through repeated data collection. EMS personnel can become empowered to face new challenges and more actively participate on the health care team once strong scientific knowledge is combined with the ability to think critically and evaluate a given situation.

Patient-care documentation is another invaluable and necessary skill (Anderson, 1999). The patient-care report (PCR) form is a medical and legal document used by EMS practitioners to record a variety of data concerning the patient's current illness or injury, such as treatment and transport time intervals, adherence to established treatment protocols, and changes in the patient's status (U.S. Department of Transportation, 1997). When properly completed, the PCRs are the foundation of research, quality improvement programs, and system evaluation and alteration (Spaite et al., 1995).

*The Evaluation Process*

*Definition*.  Evaluative research involves application of scientific procedures to accumulate reliable and valid evidence (Berk & Rossi, 1990) to formally determine the effectiveness, efficiency and acceptability of a planned intervention in achieving stated objectives (Long & Harrison, 1985). Others postulate that evaluation is used to study, appraise, and help improve social programs in all their important aspects, including the diagnosis of social problems being addressed and their conceptualization (Rossi, Freeman, & Lipsey, 1999).

There is no "cookbook" approach to evaluation, thus, in properly evaluating training, consideration must be given to purposes of both training and evaluation, audiences of evaluation results, and the overall framework to be utilized (Nickols, 2000). Failure of evaluation can therefore be attributed to factors such as the lack of planning, sponsorship, budget, appropriate resources, valid measures, data collection, data analysis and summary and seeing training as a cost rather than an asset (Abernathy, 1999).

Also, because evaluation is a highly value laden activity, the views of all relevant parties must be considered (Long & Harrison, 1985).  Some evaluation priorities or needs in rank order include assessing the quality of referral sources; client outcome; client satisfaction; job performance change; cost-benefit; and training effectiveness (Abernathy, 1999; Spicer, Owen & Levine, 1983). By closely monitoring these areas, there is a more holistic view of what was or was not accomplished during training.  Thus, training is effective only if it is continuously updated, and all training activities are coordinated parts of the total training process.

***Development of evaluation criteria.*** Having decided to evaluate a training

program, one must consider the development of criteria- the many measures of success

that must be utilized in evaluating instructional programs and assessing the numerous

objectives of training programs, from individual achievement to organizational goals

(Goldstein, 1993; Benson & Townes, 1990). Goldstein (1993) has identified at least

three components of criteria- relevancy, deficiency and contamination.

A possible way to assess performance is by a single measure or a group of

measures combined into a single measure known as the composite view of the criterion

(Goldstein, 1993). The multiple–criteria approach supports treating various performance

measures independently but a single composite measure is considered invalid because

criteria are multi-dimensional (Goldstein, 1993). Evaluators should accept criteria as

multidimensional since training programs must be examined with a multitude of

measures such as participant reactions, performance, learning and organizational

objectives (Goldstein, 1993).

To create a productive training environment, training objectives must be carefully

examined to determine the type of learning necessary for acquiring essential behaviors.

Then, the appropriate learning environment could be constructed. Learning environment

refers to "the dynamics of the instructional setting, with particular emphasis on those

components that support learning in the training setting" (Goldstein, 1993, p.83). The

learning environment and instructional media are generally determined by the objectives

(through need assessment) and the form of performance required.

***Importance of learning in evaluation.*** Learning is the basic foundation of

instructional programs. Domjan (1998, as cited in Mowrer & Klein, 2001, p.1) defines

learning as "an enduring change in the mechanisms of behavior involving specific stimuli

and/or responses that results from prior experience with similar stimuli and responses."

Learning is an inferred process that is not directly observable. Learning is observable

through performance though at times, a considerable period passes before learning

becomes apparent. Chase (1997) advocates the key to achieving practical results is to

focus on performance objectives rather than learning objectives.

Gagne (1962, as cited in Goldstein, 1993) suggests the organization of the total

task into a set of distinct components, which would facilitate an effective transfer of

learning from the instructional setting to the job setting. Hence, task components that

make up final performance must be identified, placed into the instructional program and

the learning of these components arranged in an optimal sequence. Trainees learn

responses to various stimuli. Stimulus generalization simplifies the environment by

allowing one to respond to similar stimuli without having to acquire a whole new set of

responses. For example, after training in a few situations, most humans can respond in a

variety of similar settings.

Nevertheless, undesirable responses can become as 'generalizable' as more

appropriate ones. Further, a response can be appropriate for one setting but undesirable in

a similar setting. Yet, with stimulus-discrimination, participants are trained to respond

differentially to distinguishable stimuli. Such skills are critical to EMS practitioners who

must be able to differentiate varying needs of patients. Discrimination and generalization

are important procedures in training programs designed to transfer complex behaviors.

Thus, the behavior of ambulance workers in real settings depends on the ability to learn when it is appropriate to generalize previously learned responses.


***Transfer of learning.***  "There is high consensus that the acquisition of knowledge, skills, behavior, and attitudes is of little value if the new characteristics are not generalized to the job setting and are maintained over time" (Koslowski & Salas, 1997, p. 255).   Evaluation designs and criteria are chosen to measure performance in the transfer setting as a function of initial learning in the instructional program. Trainees are expected to use the skills, knowledge and attitudes developed in training in the transfer setting although problems may occur with persistence of behavior from the learning setting to another setting. Research has identified various situational constraints (e.g., lack of job-related information, training design and work environment characteristics) that hinder transfer of training to the job setting (Latham & Crandall, 1991; Baldwin & Ford, 1988). Latham & Crandall (1991) state "to the extent that a manager can minimize constraints; trainee outcome expectations should be positively affected" (p119).

Holding (1965, as cited in Goldstein, 1993), describes four scenarios involving transfer. High positive transfer occurs when stimuli and responses are identical. This may be unlikely for EMS providers, as the setting of emergencies cannot be forecasted. In the second case, the task characteristics, both stimuli and responses are so different that practice on one task has no relationship to performance on the transfer task. In such a case, the training program is likely to be ineffective. The third and most common situation in many training programs is for the stimuli to be somewhat different in training and transfer settings, but the responses are the same. Hence, the trainees can generalize

training from one environment to another. The final scenario, negative transfer, occurs when a certain response to training stimuli is practiced so that the same response is given each time those stimuli become visible. If responses become inappropriate, negative transfer results (Goldstein, 1993).

Ellis, (1965, cited in Goldstein, 1993) suggests the principles theory, that is, the analysis of transfer is not necessarily limited to those situations where the elements are identical. Rather, training focuses on the general principles necessary to learn a task so that the learner may apply them to solve problems in the transfer task. Thus, training environments can be designed without too much concern about their similarity to the transfer situation provided that it is possible to utilize underlying principles. The main concern in this context is- which environmental design most effectively enables the trainee to learn appropriate principles for application in transfer situations, and which design best avoids potential negative transfer effects (Bass & Vaughn, 1966, as cited in Goldstein, 1993).

### *The Kirkpatrick Training Evaluation Model*

In developing evaluation criteria, seven open-ended questions (Appendix B) were sent via email to four local (Alberta-based) and four American subject matter experts (SMEs) who work in combination departments involving volunteer and career EMS providers, with the aim of supplementing the knowledge base already established. Because most of these experts are extremely busy people with other pressing matters, the response rate was disappointingly low, with only three of eight SME's responding. Those who responded, and some who expressed their regrets, acknowledged the demand
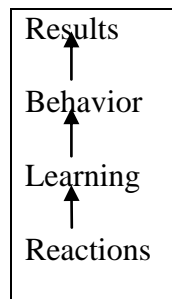
for more evaluation of training effectiveness in the EMS industry. Moreover, a number of the SMEs readily identified the Kirkpatrick's training evaluation model (Kirkpatrick, 1959; 1975; 1996; 1998) but added that in the EMS industry there has been a tendency to focus only on the first two levels- reaction and learning. Thus, they strongly recommended the conduct of an assessment on all four levels in the model.

The Kirkpatrick training evaluation model (1959; 1975; 1996; 1998), shown in Figure 2 below, divides evaluation into four levels, reaction, learning, behavior, and results. Between 1959 and 1989, this model was cited 214 times in Training and Development Journal (Alliger & Janak, 1989). Further, content analysis of relevant Australian, British and American journals from 1970 to 1986, to identify themes or trends in the evaluation of training and development, revealed that nearly one third of the articles reviewed from all three countries made reference to the model. Five of the eleven writers who presented a specific model of evaluation (rather than develop an evaluation strategy) were inspired by Kirkpatrick's work (Foxon, 1989). According to Alliger and Janak (1989), "the power of Kirkpatrick's model is its simplicity and its ability to help people think about training evaluation criteria" (p.331).

Reaction examines trainees' satisfaction with a particular training program. It is important to determine how people feel about the programs they attend. Kirkpatrick (1959; 1975; 1996; 1998) claims that for effective evaluation, training directors should first do a good job of measuring reactions and feelings of people who participate. From an analysis of reactions, a training director can determine how well the program was accepted and can obtain helpful comments and suggestions to improve future programs. It is important to get favorable reactions because the more favorable the reactions, it is

more likely that trainees will pay attention and learn the principles, facts, and techniques that are discussed. Yet, the evaluation measurement has only begun and favorable reactions are no assurance that any learning has taken place.

At the second stage, the learning of principles, facts, techniques and attitudes specified as training objectives is measured. The measures, according to Kirkpatrick (1959; 1975; 1996; 1998) must be objective and quantifiable incidents of the learning that transpired in the training program. This is crucial because advanced skills training, (such as in EMS training), often has at its center the learning of effective skills for decision-making and problem solving (Coovert & Craiger, 1997). The trainees' performance on the job is not measured rendering the next phase equally important.

Results

↑

Behavior

↑

Learning

↑

Reactions

*Figure 2. Levels of the Kirkpatrick Training Evaluation Model.*

The third stage, behavior assesses the extent to which trainees can execute desired training-related behaviors and yield increased organizational effectiveness (Goldsmith & Kraiger, 1997). This is distinguished from job evaluation, which measures the relative value, or worth, of jobs for the purpose of establishing the income hierarchy (Quaid, 1993). The final stage includes the results of the training program as they relate to organizational objectives such as costs, morale, turnover and absenteeism. In this

research, the emphasis is on delivery of patient care outcomes (Wong-Reiger, 1993) or the degree to which the training program being evaluated has been delivered as planned and according to the implementation objectives of the program providers.

Organizations have specific goals, so variations may occur. Also, organizations evaluate at different levels of the model. A 1996 Conference Board of Canada survey found that 84% of firms assessed reaction, 42% assessed learning, 23% assessed behavior, and only 16% measured results (Dessler, Cole & Sutherland, 1997, p.323). One must be wary of three assumptions of Kirkpatrick's model: the arrangement of the levels in ascending order of information provided; causal linking of the levels; and positive interrelationship between the levels (Alliger & Janak, 1989).

In testing the validity of the hierarchical arrangement of the four levels of Kirkpatrick's model in terms of decision-making, Long (1990) found that data from measuring on-the-job behavior of trainees possessed the "greatest utility to the organization in terms of subsequent decision- making about the value of the training" (p.viii). Bledsoe (1999) conducted research to validate the existence/absence of relationships among the four levels of the Kirkpatrick model as they relate to corporate computer training courses. Of the six relationships tested, findings only revealed a positive relationship between reaction and behavior (r = .511) and a weak but statistically significant relationship between reaction and results (r = .295). This implies that evaluation must be used to describe successes at that particular level alone without implications of success at other levels, and for training with multiple goals, each goal must be measured independently (Bledsoe, 1999). Support for Kirkpatrick's model is therefore strongest when all four evaluation data levels are directly compared rather than

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making a response based on one data level (Long, 1990).

Despite its usefulness, some argue that the Kirkpatrick model "…has also limited our thinking regarding evaluation and possibly hindered our ability to conduct meaningful evaluations" (Abernathy, 1999, p.3). By regarding the model as a universal framework for all evaluations, researchers tend not to examine whether the approach itself is shaping their questions and their results. Marsden (1991) contends that the Kirkpatrick model falls short of an ideal model because it is entirely outcome-oriented unlike Brinkerhoff's 1988 six-stage model, which is integrated to include instructional activities in the planning, design and implementation stages of the instructional process. The Kirkpatrick model suggests that conducting an evaluation is a standardized, prepackaged process, which excludes other options. Other discussions focus on the measurement of hard or tangible data (e.g., measures that could be translated into money) versus soft or intangible data (e.g., perceived changes in performance and customer satisfaction), which are considered more subjective and difficult to measure.

Alternative approaches to evaluation include return on investment (ROI) and return on expectation (Flynn, 1998) and the balanced scoreboard (Abernathy, 1999; Willyerd, 1997). The ideal type of training to calculate ROI is onetime training on a specific skill-teaching where outcome can be readily tested in a before-and-after scenario (Flynn, 1998). The balanced scorecard method discusses intangibles and balances business management by measuring performance across four perspectives: finance, customers, internal business processes, and learning and growth. As Abernathy (1999) asserts, it could be considered "…a check-and-balance system that enables companies to track financial results and monitor progress in building capabilities and acquiring

intangible assets for growth" (p.4). Financial measures are considered inadequate to guide and evaluate organizations as they focus on organizational past performance and foster a short-term view of strategy. Intangible assets and capabilities also affect business success and contribute to future orientations of organizations. _____

_____While acknowledging the various critiques of Kirkpatrick's model, it is felt that because this model is simple and practical (Kirkpatrick, 1996), it is most appropriate for this study due to the nature of the evaluation which is concerned mostly with outcomes such as improved job performance and patient care.

### *Evaluating Emergency Medical Services (EMS)*

*Purpose.* Only a few well-defined standards for evaluation exist in EMS (U. S. Department of Transportation, 1997). Yet, EMS need evaluating due to increased professional and public interest and increased financial support which local and national legislature provide for these services. Moreover, evaluation in EMS collects data for future planning (Cayten, 1989) to develop high-quality, cost-efficient systems to deliver care and develop and implement policy (American College of Paramedics, 1996). Abramson (1990) adds that evaluative studies appraise the value of health care by setting out to measure how 'good' care is. Research to examine response prioritization, medical direction, automation of patient care reporting and public access defibrillation, reported difficulty in categorizing or precisely describing a given element of an EMS system in a brief survey question (Cady & Lindberg, 2001).

There are two elements in the performance of practitioners: technical (application of medical science and technology to maximize the benefit of health without the

corresponding increase in its risks) and interpersonal (need for the quality of service to meet socially defined norms and values, reinforced by the ethics of health professionals/practitioners as well as the expectations of the patients), (Donabedian, 1988, as cited in Doering, 1998). The interpersonal process is seen as the vehicle/avenue through which technical care is implemented and could determine its success. However, managerial and medical oversight are often far removed from the actual care being provided in pre-hospital care, thus, patient satisfaction is useful in determining the quality of both interpersonal skills and medical care (Doering, 1998).

*Determining effectiveness.* Effectiveness is the extent to which pre-established objectives are attained as a result of activity and can be expressed at the individual, group, or community levels to which the service is provided (Abramson, 1990; Berk & Rossi, 1990). The advice and opinions of experts is valuable as it is sometimes interesting to learn from people who are knowledgeable with special skills and knowledge relevant to some field of health care. Crucial variables to measure effectiveness include attendance, satisfaction, knowledge, competence (ability to perform), actual performance, and finally customer and in this instance- patient outcome (Abrahamson, 1984).

A health service may be highly efficient, yet provides ineffective and unacceptable care to the consumers (Vuori, 1982 & Donabedian, 1980, as cited in Long & Harrison, 1985). Hence, there must be commitment to an effective, efficient and acceptable service. Effectiveness, efficiency and acceptability are determined by performance review and quality assurance. In evaluating the effectiveness of a health program, the view of health practitioners and providers of the service must be considered

(Long and Harrison, 1985). Second, the prospective user of service's viewpoint is important because if alternatives to the service exist the individual may not use the program. The last perspective is the social criterion of aggregate net benefit or utility for the population as a whole.

### *Quality Issues in EMS*

  ***Importance of quality.*** Quality is a continuous effort by organizational members to meet the customer's needs and expectations (Laffel & Blumenthal, 1989). Traditionally, the ideology of EMS included "fast response" and "fast transport" which was equated with "good healthcare", and non-medically orientated professions closely held this obsolete philosophy as the "benchmark of patient care" (Lefurgey & Morrice, 2002). Now, however, the prehospital concept has evolved into an out-of-hospital focus. Hence, programs are needed to analyze, assess and evaluate how the EMS agency and its personnel are functioning to facilitate maximum efficiency and effectiveness through constant improvement (U.S. Department of Transportation, 1997).

  The literature has little consensus as to what constitutes "quality" patient care (U.S. Department of Transportation, 1997); thus an accepted universal model to measure patient satisfaction is lacking. The most commonly accepted definition of quality care is an increased rate of survival from a life-threatening event (U.S. Department of Transportation, 1997). Considered the father of modern academic quality assessment in health, Donabedian defines quality as a trilogy of structure (attributes of the settings in which care is provided), process (what is actually done when giving and receiving care) and outcome (effects of care on the patient's or practitioner's activities) (Cayten, 1994).

Quality assessment is therefore important and includes the methods and measures for evaluating patient care quality, the results of which may be used in quality assurance (QA) programs to identify and correct problems in quality care to foster better patient outcomes and enhanced resource utilization. Quality improvement (QI) uses the results of quality assessment to continuously improve the quality of patient care, even in the absence of problems. QI activities are grouped as prospective, concurrent or retrospective based on when they are performed in relation to time of patient care (Polsky & Johnson, 1994). Findings from this study offer retrospective data since assessments occur after patient care was rendered.

*Means of evaluating quality in EMS.* QA denotes the formal measures used to constantly review clinical (and in this case, EMS) performance. It includes the cyclical processes of using information to indicate where care appears to deviate from standards; doing evaluation to get more detailed fact-finding to confirm or deny initial impressions and; using corrective action.  To avoid jeopardizing responses and loss of lives, calls are monitored and tracked and dispatchers given criteria and standard operating protocols (Spivak, 2000).

Spivak (2000) feels it is more difficult to implement QA in field EMS than in dispatching which is more often observed. Dispatching is call processing, protocol-driven, and taped. Practitioners out in the street are not so easily monitored and generally do things with only their partners or colleagues, and are not observed by people in medical control or QA positions so there is not much in terms of observational QA. Thus, in reviewing their performance, one must examine patient care reports and activity

records done after the fact. This may include listening to conversations taped in terms of hospital-to-EMS provider conversations, examination of outcomes and review of cases. Assessment and feedback can help ambulance workers improve their performance. Clawson (as cited in Spivak, 2000) found that feedback has a significant effect on dispatcher performance. For example, when feedback was provided, mean overall compliance score improved from 76.4% to 96.2% (Spivak, 2000).

A major problem in implementing QA into EMS is how to include employees without having them see it as a punitive measure to catch bad dispatchers, bad providers or correct errors. Mike Taigman, an EMS consultant and former paramedic in Oakland, feels QA does nothing other than catch errors and that QA is focused on lots of chart reviews and tends to be retrospective and focused on individuals (Spivak, 2000). Clawson sees QA as the first step in an overall total quality management (TQM) system. To make system-wide changes, one must review performance and assess where changes are needed. This feedback can lead to system-wide changes because most processes need revision in order to have the information upon which to build a TQM program.

*Quality improvement in EMS.* Another technique is QI (Spivak, 2000). While QA is more narrowly applied and focuses on one or a few aspects of an organization's operation, QI refers to changes that positively influence the operation as a whole. Both QA and QI can be used by EMS agencies to improve operations. To do so, one must first collect data and gather information as in the QA system. For comparative purposes, this process should be standardized. The program should be customer-focused and have a common goal, possibly outlined in a mission statement. Result areas must be analyzed

and include achievement of good clinical care, employee satisfaction, and retention rate.

EMS providers can benchmark the key processes that contribute to success by designing and measuring key indicators of quality, cost and collateral impact. Collateral impact indicator refers to the relationship among key processes. For example, Stout (1997) discusses Material Management and Make Ready (MM & MR), the aim of which is to serve field personnel by ensuring that a fully stocked, equipped, clean and fuelled ambulance is available for each crew at the start of each shift, and at the location of the shift start. When MM & MR is optimum, it serves to maximize the ambulance crews' percentage of on-duty time available. This also fosters the positive transfer of learning to the job setting as trainees are better equipped to perform their tasks.

A key indicator of quality reveals how well a key process achieves its purpose. The essential contribution of the key process is for the organization's ability to satisfy its customers. One examines from the customer's perspective what single measure would best reveal how well this key process achieves its primary purpose as compared with the same organization's previous performance (i.e. sequential benchmarking) and with that of other organizations (i.e. lateral benchmarking), (Stout, 1997).

Methods to assess quality in EMS can involve peer review and chart-based review involving analysis of patient medical records to see if care provided was "good" or "bad" (Fifer, 1990, as cited in Harrigan, 1992). This is in accordance with Berwick's (1989) Theory of Bad Apples wherein QA programs and peer review focus on "outliers" and on blame and faultfinding implying that problems of quality care are caused by poor intentions, usually practitioner failure (Berwick, 1989, as cited in Harrigan, 1992). The core of the continuous improvement model is a focus on consumers and on processes.

According to Berwick (1989, as cited in Harrigan, 1992), a sound TQM approach

consists of: strategic elements (aligning organizational agendas with customer needs and

carefully planning changes in the organization); technical elements (including the tools of

quality planning, quality control and quality improvement); and cultural elements

(including leadership behaviors, compensation systems, training methods, and

teamwork). The emphasis in this project is on training. The essentiality of trained

employees to an organization's quality efforts is highlighted by initiatives like ISO- 9000,

QS-9000 and the Malcolm Baldridge National Quality Award (Chase, 1997).


*Customer satisfaction in EMS.* Patient satisfaction must be considered one of the

desired outcomes of care. An expression of satisfaction or dissatisfaction is the patient's

judgment on the quality of care in all its aspects, but especially as it concerns the

interpersonal process. Hence, patient assessment is indispensable to the assessment of

quality. Not only do providers discover what is required to satisfy patients, they also learn

what displeases them. Doering (1998) argues that though the most common assessment

of quality in an EMS system is response time and survival rates, they do not indicate the

quality of care patients receive. This type of information does not consider what patients

feel is important in the design and administration of an effective EMS system but is

generally from items deemed important by the EMS providers.

Research was done to prioritize six emergency medical service treatment factors-

response time; medical care provided; explanation of care by the provider; provider's

ability to reduce patient anxiety; provider's ability to meet the patient's non-medical

needs; and the level of courtesies shown by the EMS provider towards the patient, in

terms of their impact on patient satisfaction in a pre-hospital setting (Doering, 1998).

A perceived lack of crew courtesy and politeness was the factor with the greatest impact on patient satisfaction. A fair to poor score resulted in a reduction of overall score by 60.2%. A fair to poor for response time reduced their overall rating by an 18.4%. A rating of fair to poor for quality of medical care showed a decrease of 22.6%. A fair to poor rating of the crew's ability to explain what was happening to the patient led to a drop in average overall score by 33.6%. When the EMTs' and medic's ability to reduce the patient's anxiety was rated fair to poor, average overall score declined by 32.6%. The average overall score diminished by 37.4% if the crew's ability to satisfy a patient's non-medical needs was rated fair to poor (Doering, 1998).

Patient satisfaction is a unique, multidimensional and subjective assessment that depends on factors like age, health plan, health status, expectations, cultural background, efficacy of the treatment, communication skills of the provider and previous expectations. "It is a personal evaluation of the healthcare provided, environment of care and the providers themselves" (Doering, 1998, p.71). Hsieh and Kagle (1991, as cited in Doering, 1998) claim that satisfaction is strongly associated with expectations. Mack, File, Horwitz & Prince (1995, as cited in Doering, 1998) found that an integral part of customer satisfaction is patient-provider interaction. For this reason, Doering (1998) adds it is difficult to assess and quantify patient satisfaction.

Patient satisfaction must be directly elicited from the patients and cannot be determined by observation of the care provided. Doering (1998) argues that patients do not reflect what really happened but combine their expectations with perceptions of the experience. Mack's (1995, as cited in Doering, 1998) study revealed that the strongest

predictors of how a patient will evaluate the care received are good communication skills on the part of the provider, empathy and caring. Patient satisfaction is an important indicator of the quality of medical care. As an essential part of EMS, customer service ultimately means good patient care and can bolster the morale of a unit because when a customer is satisfied with the EMS provider's performance; one feels better about oneself as professionals (Doering, 1998).

*Summary*

There is an abundance of research in the area of training evaluation. Those that pertain specifically to the evaluation of EMS training are sparse. Overall, the literature shows that EMS training is crucial for various reasons: retention of volunteers, production of more confident ambulance personnel, and improvement of patient outcome, to name a few. Furthermore, evaluation is an invaluable aspect of the training process, thus its relevance cannot be understated.

When compared to other training evaluation techniques such as the balanced scorecard and return on investment (ROI), the Kirkpatrick training evaluation model (1959; 1975; 1996; 1998) was considered most comprehensive and applicable to guide this research. Therefore, based on the Kirkpatrick model, and the literature review, the research methodology was developed to address the research questions aforementioned:

*Main research question.*

To what extent has the implementation of legislated training in EMS led to improved outcomes in Southern Alberta?

*Subsidiary research questions.*

1. How applicable, valuable, and appropriate is the training to the participants, as providers of emergency medical care?

2. To what extent have training participants acquired new skills, knowledge, and increased confidence as a result of the training?

3.  Has the training led to improved on-the-job performance by organizational members?

4. Has the training led to improved patient care and satisfaction?

**Chapter three**

**Methodology**

*Introduction*

The aim of this study was to evaluate the effectiveness of a training program for ground ambulance personnel in three rural Southern Albertan communities. This research was both descriptive and evaluative in nature and included a qualitative case study consisting of:

1) Collection of Primary Data: Interviews

2) Analysis of Secondary Data: Patient Care Reports, Call Statistics

This methods chapter discusses the research design, as well as the sample and data collection procedures used in the study. Also, an overview is provided of the individuals who participated in the study and the interview protocols used to conduct the research. Based on the literature review and dialogues with subject matter experts, the Kirkpatrick training evaluation model (1959; 1975; 1996; 1998) was considered most appropriate for this evaluation.

The aspects under study are therefore identified as the four levels of Kirkpatrick's model:

1. Reaction could be considered a measure of customer satisfaction and refers to how those who participate in the program react to it (Kirkpatrick, 1998).

2. Learning is "the extent to which participants change attitudes, improve knowledge, and/or increase skills as a result of attending the program" (Kirkpatrick, 1998, p. 20).

3. Behavior refers to "the extent to which change in behavior has occurred because the participants attended the training program (Kirkpatrick, 1998, p. 20).

4. Results refers to the "final results that occurred because the participants attended the program" (Kirkpatrick, 1998, p.21). In this study, improved patient outcome was studied.

The conduct of evaluation research involves careful prior negotiations with stakeholders (Berk & Rossi, 1990) with an interest in the health care and other services rendered by the EMS system (U. S. Department of Transportation, 1997); therefore evaluation criteria and methodology were developed in close consultation with the participating services and government representatives who provided advice and expertise plus relevant statistical information regarding historical call volumes, number of trainees, and existence of training records. The approach to the evaluation process is outlined below in terms of the four levels of Kirkpatrick's evaluation model. Overall, the levels of the model correspond with particulars of the research questions. A schematic summation of the evaluation is presented as Figure 3 below.

*Research Design*

For this study, the basic causal comparative design (Gay & Diehl, 1992) involving experimental (trained) and control (untrained) groups would have been ideal. However, this was not possible because the training program being evaluated was provincially legislated. It was mandatory that the established EMS standards be adhered to throughout the province, making it both unethical and impractical to have an untrained group. Instead, a case study approach was considered an appropriate substitute because it is useful in exploring those situations in which the intervention being evaluated has no

clear, single set of outcomes and, also, the case study inquiry depends on several sources

of evidence so that data need to converge in a triangulation fashion (Yin, 1994). For

instance, different groups were interviewed, different opinions were considered, and

information obtained through interviews was validated by analyzing program documents

(PCRs) to corroborate what interview respondents reported (Patton, 1980).

It has been suggested that when organizational interventions such as new training

programs are introduced, prospective consideration should be given to the current and

desire state of affairs (Nicholas, 1982).  This is known as the "now and then" approach

wherein managers should consider the situation now (before the training), and then (after

the training has been implemented) (Nicholas, 1979).  In this particular study, the

analysis was being conducted retrospectively, rather than prospectively, and thus, the

now and then approach could not be used.  It was possible, however, to ask subjects to

recall the previous situation prior to the training and compare that with their feelings and

experiences following the training. Retrospective questions were asked of both the

trainees and the allied professionals who work with the trainees.  While questions that

require some retrospective thought are subject to distortion and biases (Wapner &

Lebensfeld-Schwartz, 1977), this type of questioning is an effective way to compensate

for the inability to have a comparison group or a pre-test/post-test research design.

Response biases were ameliorated to some extent by interviewing both trainees and allied

professionals, and by using objective data from the PCR's to validate the statements and

opinions expressed in the interviews. The use of multiple information sources provided a

variety of perspectives through which to corroborate opinions, and confirm the accuracy

of reported results.

Generally, the research design was to compare the quality of care delivered prior to and following the initiation of the four training courses being evaluated. Given the nature of the research questions, the focus was primarily on qualitative differences though descriptive statistics were used to quantify and analyze aspects of service delivery. Sources of secondary data included official documents such as training records and patient care reports (PCRs). The aim of this research was to look at the overall effectiveness of new provincial training standards, therefore data from all three research sites were used aggregately, and comparisons between and among the communities were not conducted.



**Levels**                                      **Sample & Data Collection**

| Results- has training led to desired organizational outcomes or results? | Analysis of PCRs & interviews with patients | Raymond= 954 PCRs Coaldale= 1667 PCRs Pincher Creek=2340 PCRS |

| Behavior- has job-related behavior changed due to training? | Interviews with allied professionals | Raymond= 5 Coaldale= 8 Pincher Creek= 7 |

| Learning- were skills, values, attitudes learned? | Trainees' interviews & provincial exam results | Raymond= 10 Coaldale= 12 Pincher Creek= 10 |

| Reaction- was the training liked, valuable & worthwhile? | Interview with trainees | Raymond= 10 Coaldale= 12 Pincher Creek= 10 |

*Figure 3. Outline of Evaluation Plan.*

Originally, primary data were to be gathered during face-to-face, semi-structured survey interviews, with trainees and allied professionals. The semi-structured survey interview is considered both a type of interview and a type of survey (Singleton & Straits, 2002). Due to difficulty in accessing some respondents, mostly allied professionals with busy schedules, 25 telephone interviews were also conducted to help increase the sample size. Both the face-to-face and telephone interviews comprised pre-coded or closed questions from which quantitative data were produced (Fowler & Mangione, 1990), and open-ended questions because "the purpose of qualitative evaluation methods is to understand the perspective and the experience of people associated with a program" (Patton, 1980, p.246). Neuman (2000) establishes that by mixing open-ended and closed-ended questions in a questionnaire, the disadvantages of a questionnaire form can be reduced. Prior to the conduct of interviews, informed written consent was sought from respondents (Appendix C).

*Reaction Level*

This research involved the case study of 3 rural communities in Southern Alberta, where volunteer or paid-on-call service providers underwent training. This level deals with how satisfied participants were with the courses taken. Accordingly, to measure the level of reaction in the evaluation model, a convenience sample of 32 EMS providers undergoing training funded by Alberta Health and Wellness in Coaldale, Pincher Creek and Raymond (see Appendix D) were interviewed to assess their perception of the program's applicability, value and appropriateness.

Supervisors of the participating EMS organizations provided lists of these subjects, and later, during preliminary visits to the various training sites, they were asked to participate in the research. Original lists were longer (44) but some persons were excluded from the study as they had either completed the relevant training courses prior to the period being evaluated, self-funded their education, or emigrated from the community. Only one qualifying respondent was not involved after several unsuccessful callbacks. Face-to-face interviews were conducted on an individual basis in enclosed rooms at the training facilities.

During the interviews, the respondents were given a copy of the questions to read along. This interview protocol (Appendix E) consisted of 31 questions divided into 4 sections. For the first three sections, the questions were presented with closed responses on a continuum with a middle position stated (Neuman, 2000) so the interviewer read each of those questions aloud and recorded on paper the responses chosen by the interviewee. Section 1 included three demographic items on number of years worked for the organization, job status (full time/volunteer) and level of EMS.

Section 2 contained 17 items on the reaction of training participants to areas like training instruction, and its relevance to them. Five items were included in Section 3 and measured the overall rating of the program's effectiveness. The last section consisted of six open-ended items that elicited the interviewees' feelings about the training program's success and overall benefit to them as providers of EMS and suggestions for improvement. Because actual quotes spoken by interviewees are the raw data of interviews (Patton, 1980), and, to reduce interviewer discretion about what to record (Fowler & Mangione, 1990), the responses to some open-ended questions were tape

recorded verbatim. Notes consisting of key phrases and major points were also taken by the researcher to facilitate later analyses (Patton, 1980).

Trainees were asked to recall reactions to courses done in the past; but since it may be difficult to measure reaction retroactively, a survey instrument was used as a validity check. The survey consisted of five items (Appendix F) and was administered to eight participants in a Pre-hospital Trauma Life Support (PHTLS) course conducted March 3rd and 9th 2002, in one of the communities being studied. Seven surveys were returned (response rate of 87.5%).

*Learning Level*

The acquisition of new/improved skills, knowledge and attitudes that led to increased confidence was measured. Measurement of this level using scores from pre and post tests administered before and after the training is common (e.g., Bledsoe, 1999; Long, 1990). This approach was not feasible in this study since no pretest was given prior to training. Instead, scores for a number of training courses (such as EMR, EMT and 12-1) with standardized Provincial exams, were to be accessed via the departments to assess the level of content learning that occurred during the training. However, a major methodological barrier was encountered because, for reasons of confidentiality, it was not possible to gain access to scores from Southern Alberta Institute of Technology (SAIT). This was a limitation in terms of data collection. To counter this, it was decided to liaize with the departmental officers to identify pass marks and pass/failure rates to get an idea of whether learning objectives were achieved. Also, a number of items from the

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interviews with the trainees were related to measurement of learning. Hence, the method used to assess learning serves only as a proxy.

*Behavior Level*

The assessment of behavior is to determine if training resulted in improved job performance. Another convenience sample was interviewed to measure the behavior level of the model.  This second sample consisted of 20 allied professionals who have worked with the training participants both before and after the training. Included were five directors of the three ambulance services being evaluated who work with and supervise the recipients of the training and are in a good position to evaluate any observable behavioral changes that may have occurred due to training. These directors then provided lists of the other appropriate individuals, representing a simplified version of snowball sampling technique (Newman, 2000). There were seven registered nurses, five doctors at receiving facilities, and three medical directors who are physicians licensed by the College of Physicians and Surgeons under whom EMS practitioners are stipulated to work based on The Health Disciplines Act (Cenaiko & Ouellette, 2001).

A second interview protocol (Appendix G) was designed and consisted of two sections, each with five questions. Five items in Section 1 were closed response and directed the participants to give their perception of the impact of the training program on the trainees' job performance. As with the first protocol, these questions were read aloud and the respondent's choices recorded on paper. Five items in Section 2 were open-ended and required that the participants elaborate on their opinion of whether the training

participants' on-the-job performance has changed due to their participation in the training, and give illustrations of changes, if any. During face-to-face interviews, responses to open-ended questions were tape-recorded. Relevant notes were taken during telephone interviews.

*Results Level*

Measurement of the final level – results, examined whether or not the training contributed to improved service and positive patient outcomes and involved two data collection methods. First, because PCRs are crucial for evaluating how well an EMS organization fulfills its key performance tasks (U.S. Department of Transportation, 1997), an analysis was done to identify the number and types of treatments administered by the EMS providers. Using this historical data, which was then entered into a statistical analysis software program, Statistical Package for the Social Sciences (SPSS), comparisons were made of the number and types of treatments given before and after the training began. The analysis was focused on increases in types and number of treatments administered, in order to assess the transfer of new skills, and the appropriateness of treatments given. The PCRs are official documents belonging to Alberta Health and Wellness, so permission to access data contained in the PCRs was provided (Appendix H). A total of 4961 PCRs was analyzed: 846 for 1998; 1213 for 1999; 1368 for 2000; and 1534 for 2001.

The second method involved interviewing 15 patients to get direct and measurable information on which parts of the EMS service most affect patient satisfaction and health status (U.S. Department of Transportation, 1997). Purposive or

judgmental sampling (Newman, 2000) whereby an expert's judgment is used in selecting cases with a specific purpose in mind was used. Thus, the number of these subjects was determined by a trained health practitioner who screened the PCRs for the most critical level cases (Priority D) responded to by each service that required special treatments and skills acquired during training. Because of the sensitivity that might have been involved in talking with patients concerning possibly traumatic past occurrences, permission to interview patients was first sought from the particular ambulance service involved. Once the necessary cooperation was secured, respondents were contacted.

The interview protocol (Appendix I) designed for the patients consisted of 10 items divided into two sections. Section 1 consisted of seven items that were closed-response and measured the respondent's level of satisfaction with the emergency medical service received. As with the other interviews, these responses were recorded on paper. The other section had three open-ended questions asking the respondents to specify aspects of the care received that they were the most satisfied/dissatisfied. Notes were made of responses to open-ended questions.

*Data analysis*

Once collected, data from the PCRs were quantified, entered into SPSS and analyzed using descriptive statistics. Responses to the closed questions (measured on a five point Likert scale) were also analyzed in SPSS using descriptive statistics. Raw data from the open-ended questions used in the recorded interviews were transcribed using Microsoft Word, coded, and analyzed by organizing the data around emerging patterns/themes. Data in the form of notes from the open-ended questions were also

organized around emerging themes and summarized. Consistent with other researchers (Wong-Reiger, 1993), Newman (2000) states "a qualitative researcher analyzes data by organizing it into categories on the basis of themes, concepts, or similar features" (p.420). Based on these analyses, conclusions, and recommendations were drawn.

# Chapter Four

## Results and Discussion

Results of this case study approach (Yin, 1994) to evaluation are based on the

Kirkpatrick Training Evaluation Model and are summarized in terms of the respective

levels of this model and the research questions. As mentioned earlier, Alberta Health and

Wellness has provided funding to support four EMS training courses (EMR, EMT, BTLS

and 12-1 skills training) and has interest in their effectiveness. Data were therefore

analyzed based on these four courses.  First, demographic findings are discussed. Next,

findings from the closed response questions are presented, followed by responses to the

open-ended questions. The crux of the research is evaluating the effectiveness of a

training program, so it was considered necessary to first describe the characteristics of the

training participants involved in the study. Demographic data are outlined based on

organizational status, level of training, tenure with the organization, and EMS courses

completed.

### *Demographics*

A total of 32 trainees were interviewed as part of the study. Of this sample, three

had full-time status and the rest were volunteers. 12 of these respondents (37.5%) were

presently EMRs and the others (62.5%) were EMTs. As Figure 4 below reports, only two

respondents (6.3%) have been with the organizations between 10-15 years or for over 20

years. Another three (9.4%) have been providing EMS between 15-20 years and four

(12.5%) have worked 5-10 years as practitioners. The majority, 21 (65.6%) has been

involved with EMS for less than five years. 15 respondents (46.9%) completed the EMR course; 19 (59.4%) completed the 12-1 skills course; 14 (43.8%) completed the EMT course and 18 (56.2%) completed the BTLS course. The sum of respondents (66) completing all the courses exceeds the sample size (32) because some individuals have completed several of the courses.
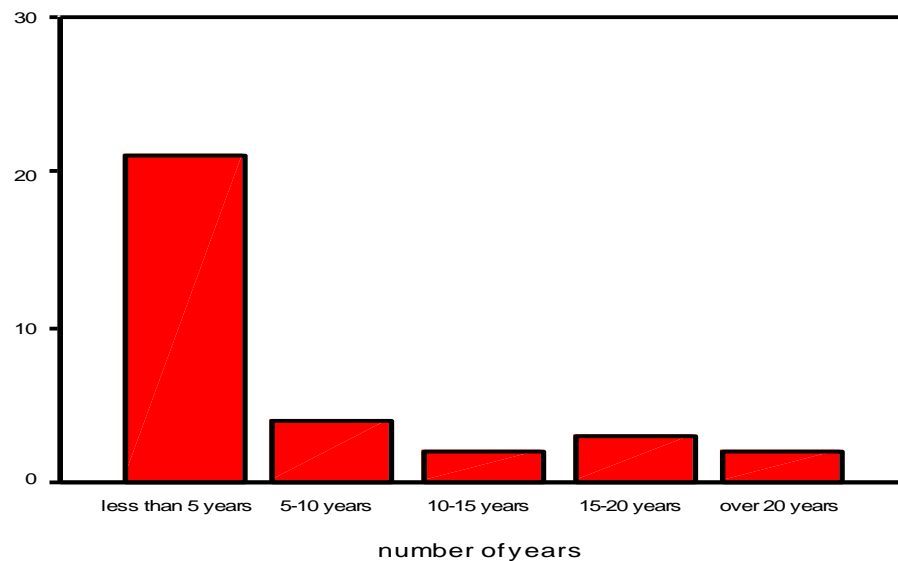


*Figure 4. Tenure with Organizations.*

## I.  The Level of Reaction

*Interview results: closed responses.*  Interviewees responded favorably to items measuring reaction, with the highest percentiles for the responses *agree* and *strongly agree* (Appendix E). Based on Table 1 below, 33.3% of responses for the EMR course either *agreed* or *strongly agreed* that the program was structured so participants could easily follow the material. When asked about whether the material presented held their interest, an interesting finding was that except for EMR (46.7% *agreed* and 40% *strongly*

*agreed*), once more, over half of all interviewees *strongly agreed* with the statement. Moreover, EMT, 12-1 and BTLS courses had no reported disagreement with the statement.

**Table 1.** *Reaction to Course Material*

|  | Training course | Strongly Disagree % | Disagree % | Neutral % | Agree % | Strongly Agree % |
|---|---|---|---|---|---|---|
| Program structured so material easily followed | EMR (N=15) | 13.3 | 13.3 | 6.7 | 33.3 | 33.3 |
|  | EMT (N=14) | - | - | 7.1 | 57.1 | 35.7 |
|  | 12-1 (N=19) | - | - | 5.3 | 68.4 | 26.3 |
|  | BTLS (N=18) | - | - | - | 55.6 | 44.4 |
|  | MEANS | 3.3 | 3.3 | 4.8 | 53.6 | 34.9 |
| Presentation of material interesting | EMR (N=15) | 6.7- | - | 6.7 | 46.7 | 40 |
|  | EMT (N=14) | - | - | - | 35.7 | 64.3 |
|  | 12-1 (N=19) | - | - | - | 42.1 | 57.9 |
|  | BTLS (N=18) | - | - | 5.6 | 27.8 | 66.7 |
|  | MEANS | 1.7 | - | 3.1 | 38.1 | 57.2 |

The item related to levels of satisfaction/dissatisfaction with the course clearly indicated greatest satisfaction with the BTLS course (72.2% for *very satisfied* and 27.8% for "*satisfied*"). These findings were comparable to satisfaction results for the other courses rated as "satisfied" or *very satisfied* (EMR, 53% *satisfied* & 33.3% *very satisfied*; EMT 35.7% *satisfied* & 57.1% *very satisfied* and 12-1, 31.6%, *satisfied* and 57.9% *very satisfied*).

Overall, however mean scores for the two responses *satisfied* and *very satisfied* for each course completed were comparable (EMR 43.3%; EMT 46.4% and 44.8% for 12-1 and BTLS, 50%). One respondent (6.7%) was *very dissatisfied* with the EMR course; and four interviewees were *somewhat satisfied*, one with the EMR course (6.7%), one with the EMT course (7.1%) and two (10.5%) with the 12-1 skills course. An overwhelming majority reported that they enjoyed their learning experience during the

courses *very much* (EMR- 53.3%; EMT-71.4%; 12-1 skills- 84.2% and BTLS-72.2%). Only one respondent from the EMR course (6.7%) indicated a *not at all* response. The other respondents choose the *fairly well* response (EMR-40%; EMT- 28.6%; 12-1 skills- 15.8% & BTLS- 27.8%).

The reaction level was linked to the first subsidiary research question- "*How applicable, valuable, and appropriate is the training to the participants, as providers of emergency medical care?*" An item addressing the "value" dimension of this question was whether topics addressed skills and knowledge relevant to the trainees' needs. Table 2 reveals that most respondents *strongly agreed* with the statement. The lowest scores were for EMR with 33.3% and 12-1 with 52.6% compared with 61.1% for BTLS and 57.1% for EMT. There was one opinion of strong disagreement (6.7%) and one of neutrality for the EMR course. For the 12-1 course and BTLS respectively, one respondent was *neutral*. All other respondents selected the *agree* response. A similar item examined whether respondents considered topics introduced to be relevant to all EMS providers in the course. Table 2 affirms that highest percentiles for all courses were for responses *agree* and *strongly agree* (means of 30.3% and 61.8% respectively). Other responses chosen were not very significant, being chosen by one interviewee only.

Remarkably, over three fourths of the entire sample (average of 76.7%) *strongly agreed* that their interest in delivering EMS increased due to the training program. However, as recorded in Table 2, there was evidence of some disagreement (EMR- 6.7%) and also of indecision for all four courses. There was evidence that respondents shared mixed feelings in terms of the repetitiveness of topics and newness of information provided. As shown in Table 2, there was a wider range of responses in comparison to

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other items. Also, differences in combined means for responses for all courses existed. For example, the means for *strongly disagree* was 7.8% and for *disagree*- 8.7%; compared with 14% for *neutral*; 27% for agree and 34.1% for *strongly agree*.

**Table 2.** *Training Program's Applicability, Value and Appropriateness*

| Question Item | Training Courses | Strongly Disagree % | Disagree % | Neutral % | Agree % | Strongly Agree% |
|---|---|---|---|---|---|---|
| Topics addressed knowledge and skills relevant to my own needs | EMR (N=15) | 6.7 | - | 6.7 | 53.3 | 33.3 |
| | EMT (N=14) | - | - | - | 42.9 | 57.1 |
| | 12-1 (N=19) | - | - | 5.3 | 42.1 | 52.6 |
| | BTLS(N=18) | - | - | 5.6 | 33.3 | 61.1 |
| Relevant topics introduced to all EMS providers | EMR (N=15) | - | 6.7 | 6.7 | 33.3 | 53.3 |
| | EMT (N=14) | - | - | 7.1 | 28.6 | 64.3 |
| | 12-1 (N=19) | - | - | 5.3 | 26.3 | 68.4 |
| | BTLS (N=18) | - | - | 5.6 | 33.3 | 61.1 |
| Program has increased my interest in EMS delivery | EMR (N=15) | 6.7 | - | 6.7 | 13.3 | 73.2 |
| | EMT (N=14) | - | - | 21.4 | 71.1 | 71.4 |
| | 12-1 (N=19) | - | - | 10.5 | 5.3 | 84.2 |
| | BTLS (N=18) | - | - | 11.1 | 11.1 | 77.8 |
| Repetitive topics with little new information | EMR (N=15) | 13.3 | 13.3 | 13.3 | 33.3 | 26.7 |
| | EMT (N=14) | 7.1 | - | 21.4 | 42.9 | 28.6 |
| | 12-1 (N=19) | 5.3 | 10.5 | 15.8 | 26.3 | 42.1 |
| | BTLS (N=18) | 5.6 | 11.1 | 5.6 | 5.6 | 38.9 |
| Course material related to real life situation | EMR (N=15) | - | - | 13.3 | 26.7 | 60 |
| | EMT (N=14) | - | - | - | 7.1 | 92.9 |
| | 12-1 (N=19) | - | - | - | 36.8 | 63.2 |
| | BTLS (N=18) | - | - | - | 22.2 | 77.8 |

*Interview results: open-ended questions.* Since attendance is a useful variable to determine effectiveness (Abrahamson, 1984), interviewees answered an open-ended question about the general pattern of attendance at the certification training courses; the aim being to decipher the value and appropriateness of sessions to trainees. All respondents unanimously agreed that the attendance was generally "good", "very good" and "excellent." Similar themes emerged in response to the question about reasons for this "good" attendance and included comments like:

> Partly because it's an important training for us because we know that it's very applicable, it's hands on, and that's what we do… knowing that I personally

didn't have to pay for it, I take it as a privilege being able to take extra courses and I don't take it for granted.

I think people see the importance of maintaining their training, especially as it pertains to the BTLS. We do it every couple of years and we take the training over, and it refreshes our minds, and it's very good to have that training… if it's something that really didn't apply to them, you would have a low turn out, people just won't see the importance of it, but when you're using the stuff every day when you're on call, it's very important to keep up your skills level.

Other factors included the intrinsic need to learn the information when moving from EMR to EMT, having access to great instructors who provided useful information, and interested and very dedicated people.

Another open-ended item concerned which area of the courses was considered most beneficial. The most frequent response (about 14 individuals) was that the hands-on component was most useful to them. This was mostly attributed to the individuals' learning style and as some stated:

I would have to say the hands on portion, that's just the type of learner I am, I think I'm the type of person that needs to not only see it on a board or hear somebody say it but actually get involved and do it. That's how I learn best.

Some felt that the practical scenarios provided opportunities to prepare them for full responsibility for actual patients (Porter, 1987). Additional explanations included – "understood more in-depth reasons behind certain actions", and "because scenarios practiced were what they run into in the service." Other areas of most benefit highlighted were the new skills acquired (e.g., IV therapy, enthonox and patient assessment) because as the caregiver, they could do more for patients. A few chose not to identify any specific area of most benefit claiming that all areas were beneficial to them since their skills as an EMS provider were broadened and they gained increased knowledge of what to do on the

scene. Of interest was that only one person mentioned that the theoretical aspect helped

to develop a clearer understanding of what to look for in patient assessment, physiology,

and so forth.

The open-ended item concerning area of the course that was least beneficial

produced a wide range of responses. As illustrated below, most commented that there

was nothing that lacked benefit because all parts of the course were needed:

> I think it all was beneficial to me, I think everything in all the courses that I've
> taken under this training grant were beneficial to me. I don't think there was
> anything that didn't benefit me especially because I do it on a full time basis, it's
> my job, I need this training.

Overall, specific areas of displeasure were related to styles of presenting material

(e.g., some lectures were too long and drawn out or the different protocols were not

properly explained). Others commented on having to do over 12-1 skills already

possessed (e.g., registered nurses had acquired skills such as IV therapy & cardiac

monitoring). Another felt that the instructors should have assumed a knowledge base in

reviewing skills. Additional areas dealt with time schedules. For instance, mention was

made of difficulty in attending summer sessions due to personal commitments and one

EMR interviewee stated that times slated for ambulance ride-alongs were not convenient.

Dissatisfaction was also expressed with the provincial testing because examination rooms

were overcrowded and final testing scenarios were poorly organized.

*Discussion.* As proposed by Kirkpatrick (1998), this study has obtained both

quantitative and qualitative information on trainees' reactions to both the subject and the

facilitators of the training program. In general, respondents reacted favorably to questions

pertaining to the structure of the courses evaluated. According to Kirkpatrick (1998), measurement of reaction provides valuable feedback for improving future programs and for establishing standards of performance for future programs. This suggests that favorable reaction of participants to training programs means minimal changes to upgrade the program may be required in the future; resulting in more efficient use of resources because much training in organizations is geared toward future financial performance (Willyerd, 1997).

A practical implication is that to ensure favorable reactions, when programs are considered that involve many employees, or a significant investment of funds (Phillips, as cited in Kirkpatrick, 1998); trainers, Human Resource Managers and policy makers in general should carefully design and implement training programs based on results from a detailed need assessment (Goldstein, 1993). Important data at this level is therefore useful in decision-making about the continuity/discontinuity of training programs (Kirkpatrick, 1998).

Moreover, training departments should realize that favorable reactions suggest interest, attention and motivation to learn (Kirkpatrick, 1998; Baldwin & Magjuka, 1997). Results show that the training program being evaluated has increased the respondents' interest in EMS delivery. Hence, consistent with Bledsoe (1999), this study emphasizes to Human Resource Managers, the appropriateness of evaluation at the reaction level for training conducted to motivate employees.

With reference to the first subsidiary research question, "*How applicable, valuable, and appropriate is the training to the participants, as  providers of emergency medical care,*" overall findings suggest that the training participants deemed the training

program to be considerably valuable and applicable to them as providers of EMS.

Research findings therefore support Bledsoe's (1999) view that the relevance and interest

of course content to trainees help to determine student satisfaction. Again, this highlights

the significance of Goldstein's (1993) suggestion for decision makers to ensure program

effectiveness by identifying relevant training needs through conduct of thorough

organizational, task and person analyses before legislating, designing or implementing

training programs. For successful training programs, trainers should therefore adopt the

philosophy that "if my customers are unhappy, it is my fault and my challenge to please

them" (Kirkpatrick, 1998, p. 68).


*Survey used as validity check for reaction.* As aforementioned, it was not

possible to collect specific data on reaction retroactively. Hence, a survey was

administered as a validity check to measure reaction of eight respondents to a Pre-

Hospital Trauma Life Support (PHTLS) course held during conduct of the research at one

of the research sites. These respondents were also involved in the main study and were

asked to assess the overall value of their training experience.  Of the respondents, 42.9%

rated it as *good* and the remaining 57.1% rated it *outstanding.* There was 100% response

that this program was worthwhile in terms of its cost and time away from normal job

duties and that it would be recommended to peers. Also, the program was rated quite

highly on a scale of one (*poor*) to five (*outstanding*) for all qualities listed. 71.4% chose

four and 28.6% selected five for the program's practical value.

In terms of new ideas gained, 14.3% rated the program three and an equal

proportion (42.9%) rated the program four and five respectively. The survey solicited

responses about whether the program was helpful to participants' self-development. Over

half of the respondents (57.1%) gave it a rating of four and 28.6% rated it as *outstanding*;

the remainder (14.3%) rated it three. Most dramatic findings were related to items about

the program's relevance to participants' jobs and whether the program maintained their

interest. Almost three-quarters (71.4%) of the respondents rated the program as

*outstanding* for both items; the rest (28.6%) rating the program as four for both items.


*Discussion.* Findings from this survey produced similar positive findings to

interview items measuring reaction. Although this was not one of the courses being

evaluated here and the survey was not administered to respondents in all three

communities, it is a fair assessment to say that the interview results have been validated

because this PHTLS course has similar characteristics to the four courses being

evaluated. The course was funded by Alberta Health and Wellness and involved all

volunteers.


## II. The Level of Learning

First, results from the certifying provincial tests taken by training participants are

discussed. The focus then shifts to a discussion of findings from interview items related

to measurement of skills, knowledge and concepts learned. This level is related to the

second subsidiary research question- *"To what extent have training participants acquired*

*new skills, knowledge and increased confidence as a result of the training?"*

As stated earlier, it was not possible to use the pre test-post test method to

measure learning. Also, efforts to access individual scores for the provincial testing to

assess levels of content learning that occurred during training were not possible for

reasons of confidentiality. However, the departmental chiefs indicated their departments'

pass/failure rates to give an idea of whether learning objectives were achieved. The

chiefs of the three respective departments reported very high pass rates. According to one

chief, "we have never had anyone from our service fail." Another stated that the pass rate

is almost 100% because in the last four years, only one person is known to have failed a

course, either as an in-service at the department or while taking a course from one of the

institutions. One department mentioned that:

> The goal of teaching at our level is to increase the knowledge base of each
> individual. With that in mind, we endeavor to help each person succeed, not fail.
> If a student is struggling, we spend extra time with that person and help them
> along.

*Interview results: closed responses.* Learning occurs with one or more of these

conditions: changed attitudes, increased knowledge and/or improved skills (Kirkpatrick,

1998). There is indication that as a result of the training, providers have gained an

increased understanding of EMS. For instance, Table 3 below confirms that, for the EMT

course, 71.4% of respondents felt strongly that they better comprehended the field.

Findings of *strongly agree* for the BTLS course were 66.7%. Highest frequencies of

agree (6.7%), *strongly disagree* (6.7%) and least occurrences of *strongly agree* were for

the EMR course. Overall means for all responses in the four courses combined were

highest for *agree* (34.9% and *strongly agree* (56%).

Generally, respondents reported low scores for the interview item about whether

time spent on each topic was effectively allocated. Though more than 50% of the

respondents for the EMT course (64.3%) and almost half of the 12-1 respondents *agreed*

with the statement (Table 3), overall means for combined courses for each response

revealed the majority *agreed* with the statement.

**Table 3.** *Items Measuring Learning*

| Question item | Training Courses | Strongly Disagree % | Disagree % | Neutral % | Agree % | Strongly Agree% |
|---|---|---|---|---|---|---|
| Material was presented in a way that increased my understanding of EMS | EMR (N=15) | 6.7 | 6.7 | 6.7 | 46.7 | 33.3 |
| | EMT (N=14) | - | - | - | 28.6 | 71.4 |
| | 12-1 (N=19) | - | - | 5.3 | 42.1 | 52.6 |
| | BTLS (N=18) | - | - | 11.1 | 22.2 | 66.7 |
| | Means | 1.7 | 1.7 | 5.8 | 34.9 | 56 |
| Time spent on each topic was effectively allocated | EMR (N=15) | 6.7 | - | 33.3 | 26.7 | 33.3 |
| | EMT (N=14) | - | 7.1 | 7.1 | 64.3 | 21.4 |
| | 12-1 (N=19) | - | - | 36.8 | 47.4 | 15.8 |
| | BTLS (N=18) | - | - | 5.6 | 50 | 44.4 |
| | Means | 1.7 | 1.8 | 20.2 | 47.2 | 28.7 |
| Training facilities were conducive to learning | EMR (N=15) | 6.7 | - | 20 | 33.3 | 40 |
| | EMT (N=14) | - | - | 14.2 | 7.1 | 78.6 |
| | 12-1 (N=19) | - | - | 10.5 | 26.3 | 63.2 |
| | BTLS (N=18) | - | - | 11.1 | 22.2 | 66.7 |
| | Means | 1.7 | - | 14 | 22.2 | 62.1 |
| Balance of presentation modes contributed to my learning | EMR (N=15) | 6.7 | - | 6.7 | 40 | 46.7 |
| | EMT (N=14) | - | - | - | 35.7 | 64.3 |
| | 12-1(N=19) | - | - | 10.5 | 31.6 | 57.9 |
| | BTLS (N=18) | - | - | - | 27.8 | 72.2 |
| | Means | 1.7 | - | 4.3 | 32.5 | 60.3 |
| Amount of hands on practice was adequate | EMR (N=15) | 6.7 | 6.7 | 26.3 | 33.3 | 26.7 |
| | EMT (N=14) | - | - | 21.4 | 21.4 | 57.1 |
| | 12-1(N=19) | - | - | 26.3 | 42.1 | 31.6 |
| | BTLS (N=18) | - | - | 16.7 | 33.3 | 50 |
| | Means | 1.7 | 1.7 | 22.8 | 32.5 | 41.4 |

A significant portion of interviewees indicated a *neutral* response (mean of 20.2%

for the four combined courses). Except for the EMR course, more than half of the

interviewees *strongly agreed* that facilities were conducive to learning and that the

balance of presentation modes contributed to their learning.  Findings were less

outstanding for the item of whether or not the amount of hands on practice was adequate

with responses being somewhat more evenly distributed.

Table 4 below presents results pertaining to overall effectiveness of individual modes of presentation. An interesting finding was that of all five modes and for all courses, most respondents felt that role play/simulation was most effective (overall means of 70%) with participant discussion having the second highest overall means (47.6%) for the combined courses for the *very effective* response.

**Table 4.** *Effectiveness of Presentation Modes*

| Question Item | Training Course | Very ineffective % | Ineffective % | Moderately effective % | Effective % | Very effective % |
|---|---|---|---|---|---|---|
| Effectiveness of case studies | EMR (N=15) | - | 6.7 | 33.3 | 46.7 | 6.7 |
| | EMT (N=14) | - | - | 21.4 | 42.9 | 28.6 |
| | 12-1 (N=19) | - | - | 21.1 | 26.3 | 31.6 |
| | BTLS (N=18) | - | - | 22.2 | 27.8 | 44.4 |
| | Means | - | 1.7 | 24.5 | 35.9 | 27.8 |
| Effectiveness of lectures | EMR (N=15) | 6.7 | - | 20 | 60 | 13.3 |
| | EMT (N=14) | - | - | 14.3 | 50 | 35.7 |
| | 12-1 (N=19) | 5.3 | - | 15.8 | 52.6 | 26.3 |
| | BTLS (N=18) | - | - | 11.1 | 50 | 38.9 |
| | Means | 3 | - | 15.3 | 53.2 | 28.6 |
| Effectiveness of role play/simulation | EMR (N=15) | 6.7 | - | 20 | 20 | 53.3 |
| | EMT (N=14) | - | - | 7.1 | 21.4 | 71.4 |
| | 12-1 (N=19) | - | - | 15.8 | 21.1 | 63.2 |
| | BTLS (N=18) | - | - | 5. 6 | 33.3 | 72.2 |
| | Means | 1.7 | - | 12.1 | 24 | 65 |
| Effectiveness of video tape/film | EMR (N=15) | 13.3 | 6.7 | 33.3 | 20 | - |
| | EMT (N=14) | - | - | 21.4 | 28.6 | 28.6 |
| | 12-1 (N=19) | - | 5.3 | 21.1 | 15.8 | 15.8 |
| | BTLS (N=18) | - | - | 11.1 | 27.8 | 33.3 |
| | Means | 3.3 | 3 | 21.7 | 23.1 | 19.4 |
| Effectiveness of participant discussion | EMR (N=15) | - | 6.7 | 13.3 | 53.3 | 26.7 |
| | EMT (N=14) | - | - | - | 50 | 50 |
| | 12-1 (N=19) | - | - | 5.3 | 36.8 | 57.9 |
| | BTLS (N=18) | - | - | 5.6 | 38.9 | 55.6 |
| | Means | - | 1.7 | 6.1 | 44.8 | 47.6 |

***Discussion.*** Though positive reactions do not imply learning has taken place (Bledsoe, 1999), findings for the level of learning were also favourable. Generally, the

various presentation modes were considered effective in facilitating learning, signifying the importance of appropriately designing the learning environment (Goldstein, 1993).

Remarkably, simulation was considered the most effective training technique and according to the literature, is a factor that helped to increase both confidence and competence (Davis, 1998). Consistent with other researchers, this study therefore reinforces to training professionals the criticality of designing programs to meet the needs of the four different types of adult learners (Grandey & Margolis, 1998).

Scores related to the repetitiveness of information were not very favorable; for instance, during interviews, some respondents mentioned that the registered nurses already possessed some of the 12-1 skills.  This suggests that trainers can maximize benefits from training by planning programs which teach only knowledge and skills needed by employees for effectiveness on the job (Coovert and Craiger, 1997). The study emphasizes that evaluation at the level of learning is necessary when an objective of training programs is to provide basic concepts that are recalled in the job setting (Bledsoe, 1999).

### III. The Level of Behavior

*Interview results: closed responses.* Like Sorensen (1956, as cited in Kirkpatrick, 1959), instead of using a before-and-after measure of behavior, participants were asked to indicate what changes, if any, had occurred. In order to gain insights from others, 20 allied professionals in the three communities who have worked with the practitioners before and after the training were interviewed to get their perception of changes in the on-the-job performance of the training participants. Included in this sample were all five

of the departmental officers (25%), eight medical doctors (40%) and seven registered

nurses at receiving facilities (35%). This level relates to the third subsidiary research

question- *"Has the training led to improved on-the- job performance by organizational*

*members?"*

Table 5 below documents results from these interviews (Appendix G). Findings

show that interviewees felt that the training led to improved job performance by the EMS

providers involved. Respondents for example, all felt that training participants are better

equipped to deal with demands from patients for quality and value.

In response to the second subsidiary research question, there was 100% support of

the view that EMS providers appear more confident as a result of the training and also

95% of the sample felt that the ambulance personnel had acquired skills they did not

possess prior to training. 80% of interviewees perceived increased professionalism in the

workers but 20% had either neutral feelings or disagreed, stating that the EMS providers

were always very professional.  Thus, interview data (30% *agree*, 60% *strongly agree*

and 10% *neutral*) indicated a marked improvement in the quality of patient care since the

training was initiated.

**Table 5.** *Perceptions of Improvement in Trainees' Job Performance*

| Interview item | Disagree % (N=20) | Neutral % (N=20) | Agree % (N=20) | Strongly agree % (N=20) |
|---|---|---|---|---|
| Demands from patients for quality and value better met | - | - | 45 | 55 |
| EMS providers appear more confident | - | - | 40 | 60 |
| EMS providers appear more professional | 10 | 10 | 30 | 50 |
| Acquisition of skills not possessed before training | - | 5 | 45 | 50 |
| Marked improvement in quality of patient care | - | 10 | 30 | 60 |

*Interview results: open-ended questions.* Data from open-ended questions asked

to allied professionals verified the responses to the closed response questions. For

instance, all interviewees quickly agreed that the training has impacted positively the

performance of the training participants. Some general themes emerging for this item

include "knowledgeable", "competent", "greater breadth of knowledge and experience",

"new skills level" and "improved ability to perform".  Some direct comments generated

from specified allied professionals for this item are presented below and are organized

according to the emerging theme and the individual's occupation:


**Theme: Confident and Competent**

> **Supervisor:** …the skills in EMT and 12-1, when it enhances your skills levels, it increases your confidence. If you don't have the confidence, I don't think the patient care is total because competence and confidence go together.

> **Supervisor**: …I can see increased confidence in the members that have taken the training, they feel more comfortable in dealing with patients and they're quick to get into it. Before, they'd stand back and kinda wait for somebody else to do the work and now because they know how to do it, they'd get in there and do it themselves, and it makes them feel better because they know what they're doing.


**Theme: New Skills**

> **Medical Director:** … before it used to be very much a case of transport service, they went, they picked up, they brought them. They took them whenever it was required. Now there's assessment, appropriate initial treatment, there are things being done on site that are actually beneficial to that individual. They're bringing in patients where the status of the patient is established and known as opposed to bringing somebody in, they're now bringing people in where they know the pressure, they know the oxygen saturations, they can talk about other things related to the magnitude of the injury…they're giving some basic interventions even simple things like oxygen or at least those that impact on how the patient's needs are met initially. There's an enthusiasm to improve their skills.

**Theme: Knowledgeable**

>  **Hospital Manager:** … overall they're more confident, more capable, and they're much more assistance to us because they know what to do and when we ask them to do something they know what it is, they're wonderful.

Allied professionals were also asked to describe specific examples of how the training has improved patient care. Responses were centered on the acquisition and use of various skills appropriate to the level of EMS being provided (Appendix A). From notes taken, it was obvious that the training has resulted in numerous incidents of improved patient care. As a case in point, it was mentioned that ambulance workers could now perform better patient assessment and thus provide more information on the patient's status to receiving facilities as well as communicate and explain things more effectively to patients. One medical director remarked that formerly seen as partly trained/untrained individuals have now become more independent and do not demand the same degree of supervision.  Like the supervisor above, he also felt that the EMS providers under his direction are more willing to become involved and since the number of persons with formal training has increased, there are more skills, resulting in improved patient care. Comments from transcribed interviews for this item are given below:

>  **Medical doctor:**  For example, we've had situations where somebody had a significant fracture, whereas before they'll just load them up and take them, they can come in appropriately splinted and cared for…likewise the attention that's given to c-spine or potential c-spine injuries in terms of how they handle that patient or precautions are taken in terms of immobilization prior to arrival at the hospital…these are examples of the quality of the service and the spectrum of interventions they are capable of giving.

>  **Supervisor:**  I think the biggest one is the EMR to EMT training because as an EMT a person can start IVs and in our field that's very important, the EMRs can't do it…they have more knowledge and with a better knowledge base, they can do

more…and they're better partners, like when I work with those people, I feel myself more confident…because they can do more.

**Hospital manager:** Well, now when we get patients that are cardiacs, you know they automatically have the quick combo pads on, the IVs started, they're on the monitor, the AED defibrillator is there, I haven't seen where they automatically had to use the defibrillator but it's there, it's ready, they know how to do it, the patient's always packaged perfectly. When they come to us the c-spine precautions are always done, no judgments are made out in the fields, they go by the mechanism of injury… they're very professional…they are of much more help to us in the hospital, when we want them to do something they do it, so it's very evident.

**Supervisor:** Our EMRs and EMTs are very confident because they are trained. They understand things, they all go on lots of calls. The training has just gotten better and advancing all the time. So the specific examples I guess they are just more confident in all their skills. They had the skills before but I guess through this new benefit of this training program and the training with a simulated doll, we are doing lots of cardiac monitoring, lots of airway stuff with airway materials, with IVs. It has come a long way; the D50 training for diabetics has been much improved. They are just more confident in using these skills.

**Supervisor:** When I first started with the service we would scoop and run, we did some packaging and some splinting and that was basically it. Now our patients are getting greater care, they are having different kind of splints, they are having enthonox, cardiac monitoring, IV started, D50. This is greatly improving the care that our patients are getting which is hopefully having a better outcome for them.

**Nurse:** They come better packaged, that's what we call it, you know that means a complete assessment's done, if they're cardiac patients put on a monitor, if they're bleeding, they've got an IV started, … and they didn't do a lot of that before, they didn't certainly start IV…

**Nurse:** they can give glucose, and I've seen one put glucose on, and the patient responded right away, can do cardiac strip, and D50.

Attention is now given to trainees' self-perception of how the training program

has affected their delivery of EMS. Interesting comments included the following:

Well, my skills are a lot better; I can do more for the patients than when I first started out, I can help patients better. Without your 12-1 skills you can do EMR and EMT but those are great assets to have in order to help your patient… you have more openness to talk to patients. Like at first you get in the ambulance, you don't know what to say to people and then as you go along you get a lot better at talking to people and finding out the information that you need to know.

Well, my scope of practice has expanded, when I came here I just had my EMT, I didn't have my 12-1 skills and so to get my 12-1 skills, and my patient care improved, I was able to do a lot more for my patients, gaining my 12-1 skills … and I think also going to all of these programs, you also get more confidence and I think that's a big thing within the EMS field, gaining the confidence and knowing what to do in certain situations and definitely these training programs have improved that.

Patient outcome is very positive, just last week I used what's called D50W on an insulin patient, that's a 12-1 skill, that person could have deteriorated very quickly, gone into seizures which would have caused a lot of other problems and I was able to give that patient what's basically liquid sugar, but it's a 12-1 skill that I learnt and it improved my patient's condition before we arrived at the hospital.

However, one person did not detail any specific area of improvement in the EMS

service provided but added that:

 I think it's just enhanced it a little more, I think if you can go away from a course picking up a few little pieces of wisdom and you can apply it to your career then you know it's worthwhile, but I also think there's always room for more learning and to grow, as far as my delivery, I think I'm the same in the amount of energy I put into my job or the effort I put into it, but it's nice to have the tools and the educational resources to help supplement current knowledge and to be updated with the latest changes and modifications to treatments and knowledge.

One interviewee believed that his care giving is:

… Much more thorough, like when I do a full primary survey on everybody I see now, I'm able to catch things and I'm able to be much more efficient and effective, my charting is more effective… I've definitely improved in my care giving …as an EMS provider. I'm comfortable with it, I can walk up and give a general overview and just go into autopilot and turn on and do a primary survey airway, breathing, and circulation …I start at the top and go through the scenarios that we repeated over and over…so it helped me to switch into autopilot rather than let your emotions take over.

Generally speaking, the interviewees were very optimistic that there was a marked improvement in the quality of care they now give to patients. As expected, a number of interviewees spoke of their increased confidence in going on calls (due to increased knowledge, doing more calls and gaining more experience) and of their increased ability to do much more for their patients due to newly acquired skills (Bernier, 1997). A few indicated too that prior to the training they either could not go on ambulance calls before or only had supportive roles (as observers) on ambulances but they are now more actively involved in basic patient care.

*Discussion.* Findings at this level were in harmony with Kirkpatrick's (1998) observation that behavior should be measured by surveying and/or interviewing trainees, their immediate supervisors and others who are knowledgeable about their behavior. Also, anticipated positive findings at the level of behavior were based on the reported positive linear relationship between the levels of reaction and behavior (Bledsoe, 1999); and on Kirkpatrick's (1998) position that no behavioral change can be expected without accomplishment of one or more learning objectives (i.e. knowledge learned, skills developed or improved or attitudes changed).

Results indicated positive transfer of skills and knowledge from the training to the job setting. Similar positive findings were reported by Kirkpatrick (1998) who measured behavioral changes in participants of a training program on developing supervisory skills. This strengthens previous research that managerial support is necessary for successful training (Bratton, 1994) that results when skills and knowledge gained during training are reinforced on the job (Clarke, as cited in Kirkpatrick, 1998). Therefore, bosses should not

prevent or discourage trainees from applying his or her learning on the job (Kirkpatrick, 1998). Moreover, the study signifies that Human Resource Managers should flexibly design jobs to redefine work and responsibilities in light of new capabilities and competencies (Gold, 1994c) especially because performance lies at the core of the Human Resource Management cycle (Gold, 1994a).

Another anticipated finding was that the provision of adequate and easily accessible training opportunities resulted in improved job performance (Bernier, 1995). Results show that participants have developed new skills as a result of the training (Nickols, 2000) and seem more confident, and competent in demonstrating behavior that is relevant to the job (Gold, 1994a).

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his research has therefore demonstrated that evaluation at the behavior level is appropriate for training that aims to change how employees do their work (Bledsoe, 1999). Further, besides having implications for trainers, results from this study have significance for Human Resource Managers in the design of systems of performance appraisal due to the link between performance and the processes of rewards and development (Gold, 1994b). It is therefore imperative that managers provide help, encouragement, and rewards when the trainees return to the job from training sessions (Kirkpatrick, 1998).

Overall, transfer validity (Goldstein, 1993) is apparent because evidence suggests that job performance has been enhanced as a result of the training program. Also, although Kirkpatrick (1998) maintains that positive behavioral changes are necessary for, but do not guarantee, improved results, this study successfully reveals to managers that

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advanced education beyond the initial training program, refreshes and reinforces previous knowledge, expands the knowledge base, improves practice, and provides necessary stimulation to prevent stagnation and attrition (Tritt, 1994).

## IV. The Level of Results

A very important expected outcome of training policy for EMS practitioners in Southern Alberta is improved patient care, and ultimately, patient satisfaction. Findings from measurement of the results level of the Kirkpatrick model are related to the fourth subsidiary research question - *"Has the training led to improved patient care and satisfaction?"* To determine whether the training program has led to improved patient outcome, 4961 PCRs from the three communities for 1998, 1999, 2000, and 2001 were analyzed. Evidence of satisfaction is deduced from responses during interviews with patients and evidence of improved patient care is seen in increases in treatments given to patients. Data from analyses of the PCRs are discussed, then, findings from the interviews are presented.

The analyses included comparing numbers and types of treatments administered to patients in 1998, 1999, 2000 and 2001 and was based on- communities, levels of acuity (EMR, EMT & ALS), and attendants. Special attention was given to numbers of treatments administered by individuals who participated in the training program being assessed. First, results from analyses of numbers of treatments by communities are presented, and then findings based on levels of acuity, followed by discussion of findings by attendants.

*PCRs based on communities.* Calls attended in the three communities (i.e. the cases studied) totaled 4,961, and 10,837 treatments were recorded from 1998 to 2001. According to Table 6 below, except for 2001, which indicated a 35.2% drop in calls responded to as compared to 2000, the total number of calls and treatments given in the three communities increased. Treatments drastically increased by 66.6% from 1998 and 1999 and simultaneously, calls increased by 43.4%, raising the ratio of treatments per call by 66.1%. However, a slight increase of 20.1% was evident in treatments administered between 1999 and 2000, increasing the ratio of treatments per call by only 20.4%. As stated earlier, the number of calls fell between 2000 and 2001, with 10.8% increase reported in treatments for this period, resulting in 1.3% decline in the treatment per call ratio. Nonetheless, by and large, between 1998 and 2001, the number of treatments was doubled, the number of calls increased by 81.3% and the ratio of treatments per call rose by 97.4%.

**Table 6.** *Total Treatments Given in the 3 Communities*

| Year | Number of Treatments | Number of Calls | Treatment Per Call |
|------|----------------------|-----------------|--------------------|
| 1998 | 1573 | 846 | 1.15 |
| 1999 | 2621 | 1213 | 1.91 |
| 2000 | 3152 | 2368 | 2.30 |
| 2001 | 3491 | 1534 | 2.27 |

Individual communities were also examined according to numbers of calls and treatments given. Table 7 below summarizes the findings from the four years. Though fluctuating, calls increased over the years. In all three communities, the largest increase in the numbers of calls was from 1998 to 1999 (e.g., 60.4% for Coaldale; 45% for Raymond

& 31.8% for Pincher Creek). Increase in calls from 1999 to 2000 was lowest for Coaldale (2%) compared with 21.8% and 18.1% for Raymond and Pincher Creek respectively. Between 2000 and 2001, Pincher Creek experienced the lowest increase in call volume (5.6%) while Coaldale had an increase of 14.8% and Raymond, 24%. From 1998 to 2001, calls in Coaldale increased by 87.2%; in Pincher Creek by 64.4% and doubled in Raymond.

**Table 7.** *Treatments and Calls for Individual Communities*

| | 1998 | | 1999 | | 2000 | | 2001 | |
|---|---|---|---|---|---|---|---|---|
| Community | Calls | Treatments | Calls | Treatments | Calls | Treatments | Calls | Treatments |
| Coaldale | 273 | 700 | 438 | 1437 | 445 | 1518 | 511 | 1621 |
| Raymond | 149 | 69 | 216 | 89 | 263 | 345 | 326 | 608 |
| Pincher Creek | 424 | 804 | 559 | 1095 | 660 | 1289 | 697 | 1262 |

In some cases, analysis of treatments given by the communities was quite remarkable. Treatments given by ambulance personnel in Coaldale doubled between 1998 and 1999, though increases for the other periods were less significant (5.6% for 1999 to 2000 & 6.8% from 2000 to 2001). In Raymond, treatments increased by 29% from 1998 to 1999 and almost quadrupled between 1999 and 2000 and increased by 76.2% from 2000 to 2001. Findings for Pincher Creek were less dramatic increasing by 36.2% from 1998 to 1999, 17.7% from 1999 to 2000 and 2.1% decrease from 2000 to 2001.

*PCRs based on levels of acuity.* Level of acuity refers to the significance of treatments given- EMR, BLS/EMT or ALS. Usually, for more emergent calls, higher

sophistications are involved in administering treatments. Though this study is concerned

primarily with EMT and EMR calls, instances of ALS intervention were identified and

isolated to accurately reflect overall improvements in patient outcome due to training.

Some (43) of the PCRs did not report the level of acuity.  There were 4918 PCRs with

10784 treatments that reported levels of acuity. These completed PCRs were used to

conduct the analysis based on level of acuity.  Based on Table 8 below, for all four years,

most calls (70%) were EMT calls while 22.5% were ALS calls and 7.5%, EMR calls. For

EMR, from 1998 to 1999, calls almost increased five times; a 7.8% rise in calls was

reported for 1999-2000; but from 2000-2001, calls decreased by 3%. With EMT, calls

rose by 47.3% between 1998 and 1999; but only by 6.8% from 1999 to 2000; and by 35%

from 2000 to 2001. ALS calls only increased by 4.8% from 1998 to 1999, by 37.2%

from1999 to 2000 and fell by 33.8 % from 2000 to 2001.

**Table 8.** *Treatments and Calls Based on Levels of Acuity*

| Level of Acuity | 1998 | | 1999 | | 2000 | | 2001 | |
|---|---|---|---|---|---|---|---|---|
| | Calls | Treatments | Calls | Treatments | Calls | Treatments | Calls | Treatments |
| EMR | 24 | 86 | 116 | 530 | 125 | 525 | 105 | 509 |
| EMT | 558 | 1229 | 822 | 1903 | 878 | 2121 | 1185 | 2622 |
| ALS | 249 | 236 | 261 | 180 | 358 | 494 | 237 | 349 |

Over the four years, as expected based on the numbers of calls, EMT skills were

most utilized in treating patients (73%); followed by 15.3% use of EMR skills and 11.7%

ALS skills. EMR treatments increased astoundingly by about six times from 1998 to

1999; but decreased by 0.9% and by three percent from 1999 to 2000 and from 2000 to

2001 respectively. EMT treatments rose by 54.8% between 1998 and 1999; by 11.5%

from 1999 and 2000; and by 23.6% from 2000 to 2001. Finally, ALS treatments declined

by 23.7 % between 1998 and 1999, then almost doubled from 1999 to 2000; but again fell

by 29.4% from 2000 to 2001. Overall, increases in treatments for all levels from 1998 to

2001 were unquestionable (EMR by almost six times; EMT doubled and ALS by only

47.9%).


*PCRs based on attendants.* Treatments given by participants in the training

program being evaluated were analyzed. Data for 31 individuals (including an EMT who

was not interviewed) were studied. For efficient analysis of data from PCRs to compare

the level of care before and after completion of the EMR and EMT-A training courses,

respondents were asked for completion dates during interviews. Many were uncertain of

this information so an official letter was sent to the Alberta College of Paramedics

(Appendix J) to request this vital information. An interviewee completed EMR training in

2002 but was excluded, as treatments were not given during the period being studied

(1998-2001) and, for another, registration information was inaccessible, making it

difficult to trace calls attended. There were 21 EMTs, eight having completed their EMT

course before 1998 but their skills base was broadened during the recent training in 12-1

skills and BLTS; the rest were EMRs.

In most instances, both treatments given and the number of providers increased.

For instance, in 1998, seven persons administered 74 treatments. Five were previously

trained as EMTs and one as EMR before 1998, and one achieved EMR status that year.

However, there were 347 treatments by five providers in 1999; 576 treatments by 14

providers in 2000 and 1768 treatments by 28 practitioners in 2001. Two persons became

certified in 1998, one as an EMR administering one treatment in 1998, 10 in 1999, 35 in

2000 and 21 in 2001; and the other as an EMT administering 56 treatments in 2000 and

66 in 2001. A practitioner trained as an EMT in 1999 provided 11 treatments in 2000 and

317 in 2001. Three persons began patient care as EMRs in 2000 and gave 199 treatments

between 2000 and 2001; another achieved EMT status in 2000 and treatments given by

this individual increased from three in 1998 and zero in 1999 to 23 in 2000 and six in

2001. Amazingly, 14 individuals completed their training in 2001 and administered 497

treatments the same year. Included were eight EMTs who administered 389 treatments

and six EMRs who administered 108 treatments. This implies significant improvement in

patient care due to acquisition of new skills and knowledge by EMS providers.

As Table 9 below shows, the training participants administered 2765 treatments,

the majority (1668) being in Coaldale. Over the years, there was a steady increase in

treatments administered both in the three communities combined, and except for Pincher

Creek where treatments decreased by 44.6% from 1999 to 2000, in individual

communities. Most dramatic are differences in treatments administered in 1998 and 2001.

**Table 9.** *Treatments by Training Participants (N=31)*

| Community | 1998 | 1999 | 2000 | 2001 |
|-----------|------|------|------|------|
| Coaldale | 69 | 160 | 419 | 1020 |
| Raymond | 4 | 10 | 59 | 541 |
| Pincher Creek | 1 | 177 | 98 | 556 |

*Discussion.* Using records (PCRs) available to determine the situation before the

program (Kirkpatrick, 1998), this study successfully compared treatments administered

by practitioners before and after the program. Improved organizational outcomes (i.e.

improved patient care) were anticipated for three reasons: evidence indicated positive reactions, learning and improved on-the-job performance; and Kirkpatrick's (1998) proposal that no final results can be expected unless a positive change in behavior occurs; and because of a weak but statistically significant relationship between reaction and results (Bledsoe, 1999).

This study highlights Bledsoe's (1999) opinion that data from the results level are useful when evaluating training designed to increase employee productivity. Like Spaite et al. (1995), evidence from this research shows the importance of secondary sources of data (e.g., PCRs) for evaluative research and quality improvement programs. For instance, findings from PCRs validated findings from interviews with allied professionals and training participants and are consistent with Steiner's (1997) suggestion that organizational productivity improves as a result of frequent and regular opportunities for training.

The evaluation undertaken therefore confirms that training programs are great assets to organizational members in terms of upgrading skills, and increasing both confidence and competence, and is supported by reported research that business success based on high standards of performance depends on a trained and constantly updated workforce (Brown & Read, 1984, as cited in Gold, 1994c).


*Patient satisfaction interview results: closed responses.* To measure satisfaction with care received, data were collected during telephone interviews with five patients from each community. A health practitioner identified 33 potential respondents from analysis of PCRs. The selection criterion was serious cases involving application of skills

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learned during the training. Average age for respondents was 49.9 years (40.4 for

Coaldale, 44.9 for Pincher Creek and 64.4 for Raymond); ages ranged from

approximately 17 to 76 years. There were nine males and six females. Table 10 below

gives the findings from interviews with patients (Appendix I). Besides an isolated case of

strong disagreement (6.7%), there was 40% agreement and 53.3% strong agreement

amongst respondents that overall, they were satisfied with the service received. Most

patients either *strongly agreed* (60%), or *agreed* (33.3) that they were satisfied with

response times; one person *disagreed*. Similarly, 53.3% of the interviewees *strongly*

*agreed* and 33.3% *agreed* that they were pleased with the time taken to resolve their

problem or need. One respondent was *neutral* and one *strongly disagreed*.

Strong disagreement (6.7%) with the two statements about provision of high

quality service in a courteous and professional manner was outweighed by feelings of

strong agreement (66.7%) and agreement (26.7%).  Findings (46.7% *agree*, 40% *strongly*

*agree*, 6.7% *disagree/neutral*) indicated most practitioners provided necessary

information. Responses of *strongly agree* and *agree*, (46.7% respectively) suggested that

the emergency medical intervention received was considered critical to the patients'

recovery. Only one patient felt otherwise.

*Patient satisfaction interview results: open-ended questions.*  In response to

open-ended questions, most (86.7%) patients could not identify any area with which they

were most satisfied/dissatisfied; nor could they make recommendations to improve

patient care, which they considered "pretty good". One patient had no complaints with

actual care but felt the billing procedure took too long. Only one patient expressed strong

dissatisfaction with actual care, recommending that the practitioners become more caring,

and vowing never to use that particular service again. The underlying issue seemed to have been that due to official policy regarding patient transport, this patient's request for transport to a particular receiving facility was denied. This suggests need for public education about use of ambulance services.

**Table 10.** *Levels of Patient Satisfaction (N=15)*

| Interview Item | Strongly Disagree% | Disagree% | Neutral% | Agree% | Strongly Agree% |
|---|---|---|---|---|---|
| I was satisfied with the service I received | 6.7 | - | - | 40 | 53.3 |
| I was satisfied with the time it took to initially address my problem or need. | 6.7 | - | - | 33.3 | 60 |
| I was satisfied with the time it took to resolve my problem or need. | 6.7 | - | 6.7 | 33.3 | 53.3 |
| The service provided was of a high quality. | 6.7 | - | - | 26.7 | 66.7 |
| Service was provided in a courteous and professional manner | 6.7 | - | - | 26.7 | 66.7 |
| The care provider was able to provide necessary information | 6.7 | - | 6.7 | 46.7 | 40 |
| The emergency medical intervention I received was critical to my recovery. | 6.7 | - | - | 46.7 | 46.7 |

*Discussion.* Consistent with Doering (1998), findings suggest that patients rated highly the EMS they received based on perceptions of courtesy, empathy, good response times, effective communication and professionalism in providing high quality care.  High satisfaction scores from the interviews with patients illustrate that in general, the service received was effective, efficient and acceptable (Long & Harrison, 1985). This signifies that training professionals and Human Resource Managers should place emphasis on both technical and interpersonal skills during training (Doering, 1998).

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The present study therefore supports Chase's (1997) argument that training is necessary for a TQM program that aligns organizational agendas with the needs of customers. An implication of the findings is that managers should realize that as part of TQM, training initiatives should be geared towards maximizing customer satisfaction (McCormick, Lewis, Mink & Batten, 1992).

***The main research question.*** According to Long's (1990) suggestion and consistent with research by Kraft (as cited in Kirkpatrick, 1998), data from all four levels of the Kirkpatrick training evaluation model were compared to answer the main research question: *"To what extent has the implementation of legislated training in EMS led to improved outcomes in Southern Alberta?"* The evidence presented in this evaluation supports the assumption that generally the training program has resulted in positive outcomes. Training participants reacted favorably to the training program and reported that they learned new knowledge and skills that were applicable to their jobs as EMS providers. Further, allied professionals agreeably felt that the ambulance workers appear more confident and competent and that there was improved job performance as a result of the training. Finally, there is increased organizational effectiveness in EMS delivery as evident in increases in treatments given from 1998 to 2001, suggesting improved patient care. Also, most patients reported high levels of satisfaction with the ambulatory care received.

Furthermore, as advanced by Abrahamson (1984), this study has provided evidence of program effectiveness using measurement of the variables attendance, satisfaction, knowledge, competence and customer/patient outcome. The training

program has achieved its first stated objective- *skilled, knowledgeable and confident emergency personnel providing safe quality care.* Attainment of the second training objective- r*etention of enthusiastic volunteers/providers with minimal disruption to their daily responsibilities and commitments* is likely because Ohara (as cited in Kirkpatrick, 1998) found that turnover rates for individuals involved in a training program designed to provide a developmental opportunity for employees were significantly lower than turnover rates for those who were untrained (4.2 % per year compared to 18.2%). Because loss of skilled labour has cost implications (Gold, 1994a); managers could use training as a tool (Nickols, 2000) to proactively keep turnover rates minimal. Comparisons of costs for hiring and training tellers ($2,700), who made up 33 percent of the training program, and costs for involving them in the training program ($110) revealed that "the corporation saved a lot of money by offering the program to employees" (Ohara, as cited in Kirkpatrick, 1998, p.105).

In summary, this study supports the use of evaluation information by stakeholders and interested audiences for decision making (Basarab, as cited in Kirkpatrick, 1998). Also, this project has successfully fulfilled recommendations for future research into the effectiveness of training programs at all four levels of the Kirkpatrick model (EMS Subject Matter Experts, 2002; Bledsoe, 1999). An implication for training professionals is that when training is successful at all four levels, it would more likely be retained by the company (Bledsoe, 1999).

**Chapter Five**

**Conclusions and Implications**

The purpose of this study was to evaluate the effectiveness of a training program in Southern Alberta. Though the research setting for the study was emergency medical services (EMS), based on the findings of this research, conclusions drawn have relevance to the field of management, program decision makers, policy makers, and to Human Resource Managers in particular. First, responses to the research questions are summarized, and then, conclusions drawn from the study are presented. Where necessary, recommendations are made.

With respect to the first subsidiary research question, "*How applicable, valuable, and appropriate is the training to the participants, as providers of emergency medical care?,*" positive findings from the study imply that it is important that trainees consider training programs to be applicable and valuable to them (reaction) since it is costly to invest in training programs which are not meaningful to employees. Also, measurement of the second research question suggests that to a large *extent, training participants have become skilled, knowledgeable and confident ambulance personnel.* Results also show that when trainees acquire or further develop skills, they become empowered to contribute more efficiently to organizational activities.

Consequently, it was not surprising that there were positive findings for the third and fourth research questions. The evaluation clearly shows that positive transfer of knowledge and skills to the job setting results in improved job performance and ultimately enhances organizational effectiveness. That is, the training has contributed to

improved job performance by organizational members and has led to patient satisfaction. In response to the main research question, a major conclusion from this study is that *the implementation of legislated training in EMS has led to improved outcomes in Southern Alberta* and data from the evaluation show that the training program evaluated was highly effective. It is therefore recommended that provincial funding be continued. Though findings from the study are not generalizable to larger urban centers in Alberta, they can be generalized to the smaller rural communities in Southern Alberta (e.g., Stirling & Milk River) which have similar characteristics to the communities (e.g., extensive use of volunteer EMS providers) and have participated in the training program funded by Alberta Health and Wellness.

This research project emphasizes the importance of the formulation of training policies to upgrade the quality of services that organizations provide to customers. It provides evidence that the standardization of products and services, accompanied by opportunities for involvement in concomitant high quality educational activities help improve services and products. As the literature on total quality management (TQM) teaches, it is recommended that organizations seeking to raise levels of quality should pay attention to benefits to be derived from training (McCormick, Lewis, Mink & Batten 1992).

Also, results conclusively support research that adequate ongoing education and retraining is crucial for continuous quality improvement initiatives (Garnett, 1994) because of the reported correlation between technical skill deterioration and increasing length of time since completion of the training program (e.g., Latman & Wooley, 1980, as cited in Wainscott, 1994; Skelton & McSwain, as cited in Wainscott, 1994). For

training departments with limited resources for investment in formal training programs, reference is made to Gold's (1994c) recommendation for line managers to become so involved in the development of their subordinates that there is little differentiation between learning and working.

Considering data for all levels of the Kirkpatrick's training evaluation model, this study lends support to Bledsoe's (1999) position that effective evaluation of training courses depends on the alignment of evaluation tools with the desired outcome of the training. Similar to Bledsoe's (1999) findings, an important recommendation is for training professionals to recognize that to get an overall assessment of any training program; evaluation should not be limited to one particular level as this may prove inadequate.

An overarching conclusion of this research is the significance of the development of new competencies for successful organizational change (Cummings & Worley, 1993). Findings suggested that the standardization of goods and/or services and the initiation of training programs geared towards helping employees reach the established standards are useful in changing an organization's culture. For instance, the EMS departments studied have changed from a 'social club' type of culture to a 'learning organization' type of culture (Driver, 2002) where new competencies have been gained by organizational members. This study therefore recommends that where necessary, managerial change agents should introduce training activities to enable employees to acquire new skills, knowledge and behaviors for implementation of legislated changes (Cummings & Worley, 1993).

*Limitations of the Study*

One limitation of this research was that the study is chiefly concerned with training and transfer validity since its aim is not to compare the trainees with any other group. Therefore, although the same four EMS courses being evaluated were the same at all three research sites, there may be issues of intraorganizational and interorganizational validity (Goldstein, 1993) as training participants may have taken the courses at different times and with different instructors. Nonetheless, a longitudinal approach could be taken later to assess both interorganizational and intraorganizational validity.

Also, at least one person was involved in the research though the course being evaluated (EMR) was not yet completed because the individual should be writing the provincial exam in July 2002. However, it was felt that this individual was in a good position to contribute to the first two levels of the model though actual patient care can only be delivered after the person becomes certified.

Additionally, the perspective of training instructors was overlooked, and their active involvement might have helped in creating a receptive climate for making changes concerning future training endeavors.

This is a retrospective study, so conclusions drawn are tempered with the realization that patient outcomes could have been influenced by factors other than those under study and there is limited ability to establish cause and effect relationships between patient care, processes and outcomes (Stapczynski, 1994).

Finally, except for the PCRs, no baseline figures were available for this study. Hence, it was not possible to compare aspects of the research such as patient satisfaction.

*Future Research*

If the training program is continued in the future, there is scope for duplication of this evaluation to allow for continued monitoring of training outcomes, especially since positive patient outcomes should be produced over time (Garnett, 1994).

In addition, ratings from this study are usable as baseline figures (Steven, Dutkowski & Hynes, 1997) to establish a standard of acceptable performance for comparative purposes and which can be based on a realistic analysis of expectations with factors like budgets and available facilities (Kirkpatrick, 1998). Also, the evaluation criteria developed here is useful to EMS organizations in other rural communities both within and outside Southern Alberta.

Using the Kirkpatrick's training evaluation model, different approaches could be taken to measure the various levels. Reaction, for instance, is measurable using data collected during training (e.g., use of notebooks for participants to record their perceptions and experiences), allowing the researcher to tap reactions as they occur. Also, experimental and control groups could be used to eliminate factors other than training responsible for observed changes (Kirkpatrick, 1998) and direct observation could be done to assess creative and skillful transfer of the knowledge to the job.

Retention of enthusiastic volunteers over time was one of the aims of the training legislation that was introduced in Southern Alberta. There is scope for further research to examine retention of these training participants over time, especially as the literature (e.g., Seaman & Associates, 2001) indicates increases in attrition at the EMT level and the majority of respondents (62.5%) are presently at that level and that the average volunteer remains active less than five years (Garnett, 1994).

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# Appendix A

## Levels of EMS and Related Skills of Trainees

*General Information*:
*Current legislation-* Ambulance Services Act and Health Disciplines Act

### Emergency Medical Responder (EMR)
*Hours of training*: 120

*Certification Requirements Include:*
a. Completion of a program of study approved by the Health Disciplines Board or one that is considered substantially equivalent to an approved program.
b. Completion of the provincial registration examination
c. Employment as an EMR within the 2 years immediately preceding the date of application OR
d. Completion of an approved program of study or completion of a refresher program approved by the Board within 1 year immediately preceding the application date.

*Recertification Requirements:*
Within 2 years prior to renewal application, members must obtain 120 continuing education credits in a manner that indicates the person's competence to provide the health services for his/her classifications. Proof of current CPR certification must be provided.

*Skills Include:*
- Conduct primary and secondary surveys, including scene assessments
- Use basic methods of managing medical, traumatic and obstetrical emergencies
- Use airway-management techniques including oropharyngeal airways, oral suction devices and a two-handed seal oxygen-supplemented mask devices to assist mouth-to-mouth ventilation
- Administer oxygen using basic delivery devices including masks and nasal cannula
- Basic bandaging, cardiopulmonary resuscitation
- Patient extrication
- Use basic splinting techniques including spinal immobilization in long spine boards and cervical collars
- Automated and semi-automated defibrillation

### EMT-Ambulance (EMT-A) or BLS:
*Hours of Training:* 300

*Certification Requirements:*
Same as EMR but individuals must be employed as an EMT- A or EMT-P if he/she is not a new graduate and provide proof of current CPR certification.

*Skills Include:*
- Primary and secondary patient assessment
- Basic management of traumatic and medical disorders
- Airway management, including the use of oropharyngeal airways and suction bag-valve-masks devices and manually operated positive-pressure breathing apparatus
- Oxygen administration, bandaging and splinting,  patient extrication
- Use of traction splints, use of spinal immobilization devices
- Emergency childbirth, psychological support measures,  cardiopulmonary resuscitation
- Maintenance of intravenous infusions without medications or blood products
- Glucose testing and oral administration of glucose
- All EMR skills

## EMT- Paramedic (EMT-P) or ALS:

*Hours of Training: 2-year training program*

*Certification Requirements: same as EMT-A*

*Skills Include:*
- Airway management, including nasotracheal, tracheal and, deep chest suction
- Endotracheal intubation, use of  esophageal; obturator tubes, emergency cricothyrotomy and use of intermittent positive pressure breathing adjuncts
- Administration of nitrous oxide/oxygen inhalational analgesia
- Application and use of pneumatic cardiopulmonary resuscitation devices
- Cardiac monitoring, defibrillation, cardioversion, carotid sinus massage and telemetry transmission
- Topical, oral, rectal, and nebulized drug administration
- Needle thoracostomy, application and use of pneumatic antishock garments
- Establishment of peripheral IV lines, including external jugular ventipuncture  for venous blood specimens
- Insertion of nasogastric tubes, gastric lavage, maintenance of intravenous infusions without medications or blood products
- Glucose testing, oral administration of glucose
- All EMT-A approved skills

*Source: Alberta College of Paramedics, (2001)*

**Appendix B**

**Questions for EMS Subject Matter Experts**

The provision of emergency medical services in rural Alberta is provided by ambulances staffed by personnel who are volunteers or paid-on-call members. In recent years there has been legislation introduced designed to increase the level of training and certification required to staff an ambulance. In order to support this initiative towards improving the skills of emergency services providers, the provincial government has made funding available to assist with training. Funding has been directed towards "low volume" services that respond to less than 600 emergency calls per year. The funding has been made available to specific municipally-based service providers.

In southern Alberta, a group of municipalities within the Chinook Health Region undertook an initiative to pool their funding on a regional basis. The concept was for various service providers to collectively share their funding allotment and to coordinate training among the various organizations. While this initiative appears to be highly successful from an administrative point of view, the outcomes and benefits of the training have not been evaluated.

Types of training that have been funded include EMR training, upgrading EMRs to EMTs, 12-1 skills, BTLS, Nitrous Oxide, Driving, CISD, and various technical rescue courses. Alberta Health and Wellness has asked our research team to evaluate the effectiveness of this training. We seek your input, as an expert in the field, regarding the factors we should focus upon in our evaluation. We would appreciate it if you could provide your opinion regarding the following questions.

1. What should be the overall goal of skills improvement training for low-volume EMS providers?
2. What general concepts or principles should guide an evaluation of the training?
3. Are there any standardized evaluation techniques or models in the EMS industry that would be suitable for this evaluation?
4. What specific issues or concepts should be addressed through the evaluation?
5. What sources of information or data would be most appropriate in conducting an evaluation of this type?
6. Are there specific references (articles or books), or subject matter experts you think we should consult for this project?
7. Any additional thoughts or comments you may have are greatly appreciated.

We would appreciate if you could provide your written response via email to b.williams@uleth.ca. If you would prefer to respond to these questions verbally, we would be pleased to arrange a telephone interview with you. Please e-mail us back to indicate that preference, or call us at (403) 329-2068.

Thank you for your input, it is much appreciated!

**Appendix C**

**Informed Consent Letter**

Dear Interviewee                                                                                       Date

I am Carol Herbert-Pemberton, a Master of Science student in the Faculty of Management at the University of Lethbridge.  I am writing to ask you to meet with me so that I can get your opinion on the effectiveness of the Emergency Medical Services (EMS) training program being conducted within the Chinook Health Region. Since 1998, Alberta Health and Wellness has provided substantial funding to improve the quality of ground ambulance services in the region. I would like to get your perspective on the impact of this legislated program.

Your involvement in this research is completely voluntary, confidential and anonymous. If at any point you wish to withdraw from the study, you are free to do so without any form of obligation. It is my intention to keep the sources of information confidential. Reports or published findings emanating from such a study will not contain specific reference to opinions attributed to particular interviewees. Rather, the data is presented in an aggregate manner. Results from the study will be made available to The Chinook Regional Health Authority and other relevant bodies to facilitate improvement in the training program. If you so desire, you will receive a feedback and a summary of the findings upon completion of the study.

The research is being carried out in accordance with the Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans, and University of Lethbridge policies.

If it is your desire to participate in the study, you are requested to sign the consent form below. If you have any further questions concerning the study, kindly contact me at (403) 382-7143 or email me at carol.herbertpembert@uleth.ca

Sincerely

Carol Herbert-Pemberton

 I consent to participate in the present study to evaluate the training program for EMS providers in the Chinook Health Region described above.


_____          _____                    _____

  Printed Name                              Signature                              Date

**Appendix D**

**Demographic Data for Communities**

(*Province population*: 2,700,000)

 **I. Coaldale**

**Membership in regional service commissions**

Lethbridge Regional Water Services Commission

Number of private registry agents –1

Number of social housing units – 94

| General Statistics | 2001 | 2000 | 1999 | 1998 |
|---|---|---|---|---|
| Population | 5,941 | 5,941 | 5,731 | 5,731 |
| Total Full-Time Municipal Positions | | 37 | 34 | 34 |
| Number of Dwelling Units | | 2,002 | 2,166 | 2,005 |
| Total Area of Municipality (Hectares) | | 799 | 799 | 799 |
| Storm Drainage Mains Length (Kilometers) | | 5 | 5 | 5 |
| Water Mains Length (Kilometers) | | 32 | 32 | 32 |
| Wastewater Mains Length (Kilometers) | | 33 | 33 | 33 |
| Length of all Open Roads Maintained (Kilometers) | | 36 | 36 | 36 |
| No. of Asst. Complaints Heard by Assessment Review Board | | 1 | 3 | 12 |
| Total Number of Assessment Complaints | | | 2 | 14 |
| Total Number of Assessment Adjustments | | 7 | | |
| Number of Residential Assessment Complaints | | | | |
| Number of Farm Property Assessment Complaints | | | | |
| Number of Non-residential Assessment Complaints | | | | 1 |

## II. Raymond

**Membership in regional service commissions**

(None)

Number of private registry agents – 1

Number of social housing units – 87

| General Statistics | 2001 | 2000 | 1999 | 1998 |
|---|---|---|---|---|
| Population | 3,056 | 3,056 | 3,056 | 3,056 |
| Total Full-Time Municipal Positions | | 12 | 12 | 12 |
| Number of Dwelling Units | | 1,010 | 995 | 982 |
| Total Area of Municipality (Hectares) | | 470 | 470 | 470 |
| Storm Drainage Mains Length (Kilometers) | | 12 | 11 | 10 |
| Water Mains Length (Kilometers) | | 29 | 29 | 29 |
| Wastewater Mains Length (Kilometers) | | 26 | 26 | 25 |
| Length of all Open Roads Maintained (Kilometers) | | 49 | 49 | 49 |
| No. of Asst. Complaints Heard by Assessment Review Board | | | 5 | 8 |
| Total Number of Assessment Complaints | | | 14 | 14 |
| Total Number of Assessment Adjustments | | 4 | | |
| Number of Residential Assessment Complaints | | 7 | 5 | 12 |
| Number of Farm Property Assessment Complaints | | | | |
| Number of Non-residential Assessment Complaints | | 1 | | 2 |

## III. Pincher Creek

**Membership in regional service commissions**

   (None)

Number of private registry agents – 1

Number of social housing units – 83

| General Statistics | 2001 | 2000 | 1999 | 1998 |
|---|---|---|---|---|
| Population | 3,659 | 3,659 | 3,659 | 3,659 |
| Total Full-Time Municipal Positions | | 22 | 26 | 20 |
| Number of Dwelling Units | | 1,548 | 1,541 | 1,393 |
| Total Area of Municipality (Hectares) | | 642 | 642 | 642 |
| Storm Drainage Mains Length (Kilometers) | | 12 | 12 | 12 |
| Water Mains Length (Kilometers) | | 49 | 49 | 49 |
| Wastewater Mains Length (Kilometers) | | 41 | 41 | 41 |
| Length of all Open Roads Maintained (Kilometers) | | 34 | 34 | 34 |
| No. of Asst. Complaints Heard by Assessment Review Board | | | | |
| Total Number of Assessment Complaints | | | | |
| Total Number of Assessment Adjustments | | | | |
| Number of Residential Assessment Complaints | | | | |
| Number of Farm Property Assessment Complaints | | | | |
| Number of Non-residential Assessment Complaints | | | | |

**Appendix E**
**Interview Protocol and Results for Training Participants**

**Faculty of Management**
**University of Lethbridge**

**Evaluation of the Training Program for EMS Personnel**

**The questions asked in this interview are designed to elicit your feelings toward the training courses you took which were funded by the Alberta Health and Wellness. Results will be used to improve the effectiveness of the training program. Please give the response that best suits you.**

## SECTION 1: DEMOGRAPHICS

Name of training participant: _____
Location  of EMS organization: _____

Status in EMS organization:   Full-time (9.4%)         Volunteer (90.6%)

Current level of training:      EMR (37.5%)  EMT-A (62.5%)

Tenure as an EMS provider with this particular organization: Under 5 years (65.6%)
 5-10 years (12.5 %)     10-15 years (6.3%)    15-20 years (9.4%)       Over 20 years (6.3%)

Training courses completed:   EMR (46.9%)  12-1 (59.4%)   EMT (43.8%)    BTLS (56.3%)

**SECTION 2: The following statements refer to specific aspects of each of the following training courses which you have completed (12-1, BTLS etc). For each these courses, I will give you a number of statements/questions. Please indicate the correct choice that best represents how you feel about the statement.**

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Strongly disagree | Disagree | Neutral | agree | Strongly agree |

1. Prior to the training, I received sufficient information about the program and what to expect in training.

| EMR % | EMT% | 12-1 % | BTLS% |
|---|---|---|---|
| 0/ 6.7/ 6.7/ 40/ 46.6 | 0/ 0/ 14.3/ 35.5/ 50 | 0/ 5.3/ 21/ 52.6/ 21.1 | 0 /0 /44.4 /27.8 /27.8 |

2. Course objectives were stated clearly and in writing at the beginning of the course.

| EMR% | EMT% | 12-1 % | BTLS% |
|---|---|---|---|
| 6.7/0/0/46.7/46.7 | 0/0/7.1/28.6/64.3 | 0/0/5.3/36.8/57.9 | 0/0/ 5.6/38.9/55.6 |

3. Topics addressed knowledge  and skills that are relevant to my own needs

| EMR% | EMT% | 12-1% | BTLS% |
|---|---|---|---|
| 6.7/0/6.7/53.3/33.3 | 0/0/0/42.9/57.1 | 0/0/5.3/42.1/52.6 | 0/0/5.6/33.3/61.1 |

4. This training program has increased my interest in the delivery of EMS.

| EMR % | EMT % | 12-1  % | BTLS% |
|---|---|---|---|
| 6.7/0/6.7/13.3/73.3 | 0/0/21.4/7.1/71.4 | 0/0/10.5/5.3/84.2 | 0/0/11.1/11.1/77.8 |

5.  The training has introduced topics relevant to all EMS providers in the course.

| EMR % | EMT % | 12-1% | BTLS% |
|---|---|---|---|
| 0/6.7/6.7/33.3/53.3 | 0/0/7.1/28.6/64.3 | 0/0/5.3/26.3/68.4 | 0/0/5.6/33.3/61.1 |

6.  The training helped me become more effective with EMS delivery.

| EMR% | EMT % | 12-1% | BTLS% |
|---|---|---|---|
| 6.7/0/13.3/6.7/76.3 | 0/0/14.3/0/85.7 | 0/0/5.3/15.8/78.9 | 0/0/5.6/22.2/72.2 |

7. Topics presented were repetitive for me and offered me little new information.

| EMR% | EMT % | 12-1 % | BTLS% |
|---|---|---|---|
| 13.3/13.3/13.3/33.3/26.7 | 7.1/0/21.4/42.9/28.6 | 5.3/10.5/15.8/26.3/42.1 | 5.6/11.1/5.6/5.6/38.9 |

8.  The training program was structured so that participants could easily follow the material.

| EMR % | EMT% | 12-1% | BTLS% |
|---|---|---|---|
| 13.3/13.3/6.7/33.3/33.3 | 0/0/7.1/57.1/35.7 | 0/0/5.3.68.4/26.3 | 0/0/0/55.6/44.4 |

9.  Material was presented in a way that served to increase my understanding of EMS.

| EMR % | EMT% | 12-1% | BTLS% |
|---|---|---|---|
| 6.7/6.7/6.7/46.7/33.3 | 0/0/0/28.6/71.4 | 0/0/5.3/42.1/52.6 | 0/0/11.1/22.2/66.7 |

10.  Time spent on each topic was effectively allocated.

| EMR % | EMT % | 12-1% | BTLS% |
|---|---|---|---|
| 6.7/33.3/26.7/33.3 | 0/7.1/7.1/64.3/21.4 | 0/0/36.8/47.4/15.8 | 0/0/5.6/50/44.4 |

11.  Training facilities were conducive to learning.

| EMR % | EMT % | 12-1 % | BTLS% |
|---|---|---|---|
| 6.7/0/20/33.3/40 | 14.2/7.1/78.6 | 0/0/26.3/63.2 | 0/0/11.1/22.2/66.7 |

12.  The balance of presentation modes (e.g., lectures, role plays, case studies etc) contributed to my learning.

| EMR% | EMT % | 12-1% | BTLS% |
|---|---|---|---|
| 6.7/0/6.7/40/46.7 | 0/0/0/35.7/64.3 | 0/0/10.5/31.6/57.9 | 0/0/0/27.8/72.2 |

13. The trainer communicated effectively.

| EMR% | EMT% | 12-1% | BTLS% |
|---|---|---|---|
| 0/13.3/6.7/40/40 | 0/0/7.1/7.1/85.7 | 0/0/0/36.8/68.2 | 0/0/0/16.7/83.3 |

14. The trainer related the course material to real-life situations.

| EMR% | EMT% | 12-1% | BTLS% |
|---|---|---|---|
| 0/0/13.3/26.7/60 | 0/0/0/7.1/92.9 | 0/0/0/36.8/63.2 | 0/0/0/22.2/77.8 |

15.  The trainer was receptive to participants' questions.

| EMR % | EMT% | 12-1 % | BTLS% |
|---|---|---|---|
| 0/0/13.3/26.7/60 | 0/0/0/0/100 | 0/0/5.3/5.3/89.5 | 0/0/0/11.1/88.9 |

16.  The material was presented in a manner that held my interest.

| EMR % | EMT % | 12-1% | BTLS% |
|---|---|---|---|
| 6.7/0/6.7/46.7/40 | 0/0/0/35.7/64.3 | 0/0/042.1/57.9 | 0/0//5.6/27.8/66.7 |

17. The amount of hands on practice was adequate.

| EMR % | EMT % | 12-1% | BTLS% |
|---|---|---|---|
| 6.7/6.7/26.7/33.3/26.7 | 0/0/21.4/21.4/57.1 | 0/0/26.3/42.1/31.6 | 0/0/16.7/33/3/50 |

## SECTION 3: OVERALL RATINGS

**Please consider each statement separately rather than let your overall feelings about the instructor determine your response.**

18. Overall, how would you rate the trainer's effectiveness in facilitating your training experience?

| 1 | 2 | 3 | 4 | 5 | n/a |
|---|---|---|---|---|---|
| Very ineffective | Ineffective | Moderately effective | Effective | Very effective | Not applicable |

| EMR% | EMT% | 12-1 % | BTLS% |
|---|---|---|---|
| 0/6.7/13.3/40/40 | 0/0/14.3/14.3/71.4 | 0/0/0/42.1/57.9 | 0/0/5.6/22.2/72.2 |

19. Overall, how useful is the information in the course?

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not useful | Hardly useful | Somewhat useful | Definitely useful | Very useful |

| EMR% | EMT % | 12-1 % | BTLS% |
|---|---|---|---|
| 0/0/6.7/26.7/66.7 | 0/0/0/14.3/85.7 | 0/0/0/47.4/52.6 | 0/0/0/27.8/72.2 |

20. Overall, how satisfied were you with this course?

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Very dissatisfied | Dissatisfied | Somewhat satisfied | Satisfied | Very satisfied |

| EMR % | EMT % | 12-1% | BTLS % |
|---|---|---|---|
| 6.7/0/6.7/53.3/33.3 | 0/0/7.1/35.7/57.1 | 0/0/10.5/31.6/57.9 | 0/0/0/27.8/72.2 |

21. Overall, how much did you enjoy this learning experience?

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not at all | Not much | Somewhat | Fairly well | Very much |

| EMR % | EMT% | 12-1 % | BTLS % |
|---|---|---|---|
| 6.7/0/0/40/53.3 | 0/0/0/28.6/71.4 | 0/0/0/15.8/84.2 | 0/0/0/27.8/72.2 |

22. Rate each of the following presentation modes in terms of their overall effectiveness. *(Percentiles calculated from those who found the presentation mode applicable)*

| 1 | 2 | 3 | 4 | 5 | n/a |
|---|---|---|---|---|---|
| very ineffective | ineffective | Moderately effective | effective | Very effective | Not applicable |

a. Case studies

| EMR% | EMT% | 12-1% | BTLS% |
|---|---|---|---|
| 0/6.7/33.3/46.7/6.7 | 0/0/21.4/42.9/28.6 | 0/0/21.1/26.3/31.6 | 0/0/22.2/27.8/44.4 |

b. Lecture

| EMR % | EMT % | 12-1 % | BTLS% |
|---|---|---|---|
| 6.7/0/20/60/13.3 | 0/0/21.4/42.9/28.6 | 5.3/0/15.8/52.6/26.3 | 0/0/11.1/50/38.9 |

c. role play/simulation

| EMR % | EMT% | 12-1% | BTLS% |
|---|---|---|---|
| 6.7/0/20/20/53.3 | 0/0/7.1/21.4/71.4 | 0/0/15.8/21.1/63.2 | 0/0/5.6/33.3/72.2 |

d. video tape/film

| EMR % | EMT% | 12-1% | BTLS % |
|---|---|---|---|
| 13.3/6.7/33.3/20/0 | 0/0/21.4/28.6/28.6 | 0/5.3/21.1/15.8/15.8 | 0/0/11.1/27.8/33.3 |

e. participant discussion

| EMR% | EMT% | 12-1% | BTLS% |
|---|---|---|---|
| 0/6.7/13.3/53.3/36.7 | 0/0/0/50/50 | 0/0/5.3/36.8/57.9 | 0/0/5.6/38.9/55/6 |

## SECTION 4: OPEN-ENDED QUESTIONS

**You are now asked to give your opinion by responding to the following questions in as much details as possible.**
23. How would you describe the training program in terms of time management?
24. Was the attendance at the training sessions generally good? What do you think was the reason for this?
25. Which part of the training was most beneficial to you? Why?
26. Which part of the course was least beneficial to you? Why?
27. How has your delivery of EMS changed since you began the program?

28. What recommendations would you make to increase the effectiveness of future training?

**Appendix F**
**Survey Instrument Used as a Validity Check**
*University of Lethbridge*
*EMS Training Evaluation*

This form is intended to evaluate your reaction to training. Please respond to the questions below as they relate to your training course noted.

Training Course_____          Instructor_____
Date(s) of Course_____          Location of Course_____
Course Host/Sponsor_____          Your Name_____

*Purpose:*  The following items assess the overall value of this training experience:

1.  Did you find the quality of this program to be (select one):

    ____      _____      _____      _____      _____
      Poor          Fair          Average          Good      Outstanding
2.  Do you feel that this program was worthwhile in terms of its cost and your time away from your normal job duties?
    Yes____          No _____     Undecided_____
3.  Would you recommend this program to your peers?
    Yes____          No _____     Undecided_____
4.  Rate the program for the following qualities

|  | Poor |  |  |  | Outstanding |
|---|---|---|---|---|---|
|  | 1 | 2 | 3 | 4 | 5 |
| a. Practical value | __ | __ | __ | __ | __ |
| b. Thoroughness | __ | __ | __ | __ | __ |
| c. New ideas gained | __ | __ | __ | __ | __ |
| d. Helpful to self-development | __ | __ | __ | __ | __ |
| e. Relevance to your job | __ | __ | __ | __ | __ |
| f. Efficient use of time | __ | __ | __ | __ | __ |
| g. Maintaining your interest | __ | __ | __ | __ | __ |
| h. Clear, understandable | __ | __ | __ | __ | __ |

Comments_____

5.  Check the degree to which the kinds of follow-up to this workshop listed here would be useful:

|  | Necessary | Desirable | Unnecessary |
|---|---|---|---|
| a. Talking with workshop members to share experiences in applying ideas | ___ | ___ | ___ |
| b. Opportunity to consult with trainer if a problem arises | ___ | ___ | ___ |
| c. Advanced workshop in this area | ___ | ___ | ___ |
| d. Briefing for my supervisor on what I've learned here | ___ | ___ | ___ |

**Appendix G**
**Interview Protocol and Results for Allied Professionals**


**Faculty of Management**
**University of Lethbridge**
**Evaluation of the Training Program for EMS Personnel**

**The questions asked in this interview are designed to elicit your feelings toward the job performance of specific providers of emergency medical services who are involved in training courses funded by Alberta Health. The aim is to assess the extent to which job performance has changed due to the intervention of the training program. Results will be used to improve the effectiveness of the training program. Please give the response that best suits you.**

Name of allied professional: _____
Location/community: _____

**SECTION 1: The following statements refer to your observation and perceptions of the overall on-the-job performance of the training participants. Please indicate the correct choice that best represents how you feel about the statement.**

1= strongly disagree/ 2=disagree / 3=neutral/ 4=agree / 5=strongly agree

1.  The training program has helped the training participants to better deal with the demands from patients for quality and value.
    (Agree= 45/ strongly agree= 55)

2.  As a result of the training the EMS providers appear more confident.
    (Agree=40/ strongly agree=60)

3. As a result of the training the EMS providers appear more professional.
    (Disagree=10/neutral=10/agree= 30/strongly agree=50)

4. The training participants have acquired skills they did not possess prior to training.
    (Neutral=5/agree=45/strongly=50)

5.  There is a marked improvement in  the  quality of care given to
    patients since the training began.   (Neutral=10/agree=30/strongly agree=60)


**SECTION 2: OPEN-ENDED QUESTIONS: you are now asked to give your opinion by**

**responding to the following questions in as much details as possible.**

6.  Do you feel that the EMS training program is needed in this community? Please explain your answer.
7.  Do you think the training program has any impact on the performance of the training participants? Please explain your answer.

8. Is there any room for improving the training program? If yes, what would you recommend to improve the training program?
9. Can you provide some specific examples of how the training has improved patient care?
10. Could you describe the service given before the training (2-3 years ago) and now?

# Appendix H
## Permission to Use PCRs

**Alberta**
HEALTH AND WELLNESS

10025 Jasper Avenue NW
P.O. Box 1360 Stn Main
Edmonton AB  T5J 2N3

January 7, 2001

To:  **Ambulance Service Managers of Pincher Creek, Coaldale and Raymond**

Subject: Ambulance Service Patient Care Report Review

Please be advised that under Section 3(3) of the Ambulance Services Act, the Minister or his designate has the authority to give a person or an individual research group permission to review Patient Care Reports for the purpose of collecting data to complete research.

Based on the authority under Section 3(3) of the Ambulance Services Act please be advised staff, graduates and under graduates of the University of Lethbridge, Faculty of Management has been given permission to review Patient Care Reports (PCR) for the following years:

- 1998 - 1999
- 1999 - 2000
- 2000 - 2001
- 2002 - 2003

If you have any concerns regarding this matter, please feel free to contact me at (780) 422-9680.

Yours sincerely,

Garry Alford
Team Leader Ground Ambulance Program
Deputy Registrar Ambulance Services Act and Regulations
Emergency Health Services Branch

**Appendix I**
**Interview Protocol and Results for Patients**

**Faculty of Management**
**University of Lethbridge**

**The questions asked in this interview are designed to elicit your feelings toward the emergency medical service that you have received. Results from this study will be used to improve the delivery of emergency medical care.**

SECTION 1: The following statements refer to how satisfied you were with the emergency medical intervention that you received. Please indicate the correct choice that best represents how you feel about the statement.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Strongly disagree | Disagree | Neutral | agree | Strongly agree |

1.  I was satisfied overall with the service I received.  6.7%/0%/0%/ 40%/53.3%

2.  I was satisfied with the time it took to initially address my problem or need.  0%/6.7%//0%/33.3%/60%

3.  I was satisfied with the time it took to resolve my problem or need.  0%/6.7%/6.7%/33.3%/53.3%

4.  The service provided was of a high quality.  0%/6.7%/0%/26.7%/66.7%

5.  The service was provided in a courteous and professional manner.  6.7%/0%/0%/26.7%/66.7%

6.  The care provider was able to provide necessary information.  0%/6.7%/6.7%/46.7%/40%

7.  The emergency medical intervention I received was critical to my recovery.  6.7%/0%/0%/46.7%/46.7%

**SECTION 2: you are now asked to give your opinion by responding to the following questions in as much details as possible.**

8.      What aspects of the care received were you most satisfied with?

9.      What aspects of the care received were you least satisfied with?

10.     What recommendations, if any, can you make to improve the quality of care delivered by the emergency medical services providers?

# Appendix J
## Letter for Completion Dates
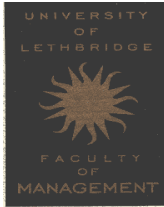
THE UNIVERSITY OF LETHBRIDGE
FACULTY OF MANAGEMENT
4401 UNIVERSITY DRIVE, LETHBRIDGE, ALBERTA, CANADA, T1K 3M4
TELEPHONE 403.329.5148, FAX 403.329.2038
WEB ADDRESS: HTTP://HOME.ULETH.CA/MAN

Ms. Donna Lefurgey, Registrar                                        May 31, 2002
Alberta College of Paramedics
304 Capilano Centre
9945 – 50th Street
Edmonton, Alberta
T6A 0L4
Fax: (780) 466-2869


Dear Ms. Lefurgey:

Our research team at the University of Lethbridge is currently conducting an assessment
of the effectiveness of BLS training in three communities in southern Alberta. Part of our
research design is to examine the level of care that has been provided prior to and
following the completion of EMR and EMT training. We have received consent for
participation from the three communities, as well as from each of the individual care
providers in the communities. The difficulty we are facing is that many of the
participants we have interviewed can not accurately recall the exact date that their EMR
and/or EMT certification was received.

It is our assumption that your organization maintains a database that would include
course completion dates and/or registration dates. In order for our research design to be
effectively carried out, it is essential that we have accurate registration dates. We have
enclosed a list of the participants in the study, and we would appreciate your assistance in
providing us with this vital information.

Should you have any questions or concerns about this request, please feel free to contact
me by telephone, fax, or e-mail.

Sincerely,

B.E. (Bernie) Williams, Ph.D.
b.williams@uleth.ca
Telephone: (403) 329-2068
Fax: (403) 329-2038