

Hot Topics Research in Emergency Medical Services

HTREMS-Student Manual

1st Edition, 3rd Printing-November 2013



FEMA

FEMA/USFA/NFA
HTREMS-SM
November 2013
1st Edition, 3rd Printing

*Hot Topics Research in Emergency Medical
Services*



FEMA

Hot Topics Research in Emergency Medical Services

HTREMS-Student Manual

1st Edition, 3rd Printing-November 2013



FEMA

This Student Manual may contain material that is copyright protected. USFA has been granted a license to use this material only for NFA-sponsored course deliveries as part of the course materials, and it shall not be duplicated without consent of the copyright holder. States wishing to use these materials as part of state-sponsorship and/or third parties wishing to use these materials must obtain permission to use the copyright material(s) from the copyright holder prior to teaching the course.

This page intentionally left blank.

TABLE OF CONTENTS

	PAGE
Table of Contents	iii
Acknowledgments	v
Course Goal	vii
Audience, Scope and Course Purpose	vii
Schedule	ix
Firefighter Code of Ethics	xiii
Grading Methodology	xv
NFA EMS Hot Topics Project Introduction	xvii
Hot Topics Research in EMS Grade Sheet.....	xix
Hot Topics Research in EMS Project Status Briefing Grade Sheet.....	xxi
A Student Guide to End-of-course Evaluations.....	xxiii
UNIT 1: RESEARCH DEFINED AND PLANNING	SM 1-1
Appendix: Homework Assignments	
Homework A: Fishbone Diagram	
Homework B: Failure Modes and Effects Analysis Worksheet	
Homework C: Writing Your Research Project Request	
UNIT 2: RESEARCH TOOLS	SM 2-1
Appendix A: Homework Assignments	
Homework D: Venn Diagram	
Homework E: Common Research Steps	
Homework F: Second Project Proposal	
Appendix B: Useful URLs	
Appendix C: Search Engines and Online Informational Databases	
Appendix D: Bringing Order to Chaos	
UNIT 3: LITERATURE REVIEW AND EVALUATION	SM 3-1
UNIT 4: DOCUMENTING RESEARCH.....	SM 4-1
Appendix: Project Status Briefing	

Appendix: Emergency Medical Services Concepts

This page intentionally left blank.

ACKNOWLEDGMENTS

The development of any National Fire Academy (NFA) course is a complex process aimed at providing students with the best possible learning opportunity we can deliver.

There are many players in course development, each of whom plays an equally important part in its success. We want to acknowledge their participation and contribution to this effort and extend our heartfelt thanks for making this quality product.

The following persons participated in the creation of this course:

Mike Stern, NREMT-P
Training Specialist
U.S. Fire Administration National Fire Academy
Emmitsburg, Md.

Russell Kuck
Instructional Systems Specialist
U.S. Fire Administration National Fire Academy
Emmitsburg, Md.

Bruce Evans, MPA, NREMT-P
Deputy Chief
Upper Pine River Fire Protection District
Bayfield, Colo.

Christopher Heppel, BS, NREMT-P
Division Chief of EMS
Lane Rural Fire/Rescue
Eugene, Ore.

Maria Beermann-Foat, MBA, NREMT-P
Battalion Chief — Training Division
Johnson County Med-Act
Olathe, Kan.

John N. Gallis, LFACHE
Annapolis, Md.

This page intentionally left blank.

COURSE GOAL

“Hot Topics Research in Emergency Medical Services” (HTREMS) is a six-day resident course using the National Emergency Training Center (NETC) campus in Emmitsburg, Md. The goal of the course is to conduct solid research within Emergency Medical Services (EMS), evaluate and synthesize the analysis data, and ultimately, identify, promote and embrace change to better service the community. The course will focus on the process of researching proven data and presenting an amenable solution to the student’s community.

At the end of the course, the student should be able to articulate:

1. How to scan the environment and conduct valid research into new processes, technologies, trends, laws and products.
2. How to read, interpret and apply EMS research, human behavior studies, EMS law and emerging issues.
3. How to identify emerging local, regional and state EMS challenges and develop technically based strategic solutions to reduce risk and enhance emergency response.
4. How technology develops and can be transferred to solve local issues.
5. What significant changes are in the short- and long-term future for EMS and equipment.
6. How EMS plays a part in all-hazards preparedness and response.

AUDIENCE, SCOPE AND COURSE PURPOSE

The target audience for the **“Hot Topics Research in Emergency Medical Services”** course is appropriate for the EMS middle management personnel that includes shift supervisor, shift captain, division chief, crew leader, battalion chief, EMS executives, EMS administrators, etc.

The scope of this course is to provide learners with knowledge and skills to identify and research issues in the EMS facing evidence-based change. The course uses instructor-led discussion, small group activities, instructor-facilitated research, and individual project activities to convey instructional points.

The purpose of this course is to provide learners with the advanced knowledge, skills and attitudes necessary to identify and research some hot topic in EMS to ultimately identify, promote and embrace change within EMS. Promoting and embracing the identified change requires that you do something with the information gathered such as writing a paper or article and presenting it locally, regionally, statewide or even nationally. Research not presented is the same as not doing the research at all. Information needs to be shared even when it goes against what you may have envisioned.

The course is structured around learning how to make a persuasive argument to the chief. To make this persuasive argument, the students will need to know how to construct an argument; how to outline/structure a paragraph to correctly communicate the desired message; and how to create a technical diagram of their argument. This persuasive argument must be in both written and oral forms. A means of perfecting the argument will be implemented by presenting it to others: peers, another group and/or someone at a higher level. Finally, students will construct a program proposal and/or progress report to technical writing standards.

This page intentionally left blank.

HOT TOPICS RESEARCH IN EMERGENCY MEDICAL SERVICES

SCHEDULE

TIME	DAY ONE	TIME	DAY TWO
8:00 - 9:00	Introduction, Welcome and Administrative	8:00 - 9:10	Instructor Facilitated Discussion on Home Agency Hot Topics
9:00 - 9:10	<i>Break</i>	9:10 - 9:20	<i>Break</i>
9:10 - 10:20 10:30 - 11:30	Introduction, Welcome and Administrative (cont'd)	9:20 - 10:30	Unit 1: Research Defined and Planning (cont'd) Activity 1.3: Using the Fishbone Diagram
10:20 - 10:30	<i>Break</i>	10:30 - 10:40	<i>Break</i>
11:30 - 11:40	Unit 1: Research Defined and Planning	10:40 - 12:00	Unit 1: Research Defined and Planning (cont'd) Activity 1.4: Failure Modes and Effects Analysis Exercise
11:40 - 12:30	<i>Lunch Break</i>	12:00 - 1:00	<i>Lunch Break</i>
12:30 - 1:30	Activity 1.1: Values and Nominal Group Technique Exercise	1:00 - 2:35	Unit 1: Research Defined and Planning (cont'd) Activity 1.5: Reasoning and Intellectual Relationships Exercise
1:30 - 1:45	<i>Break</i>	2:35 - 2:45	<i>Break</i>
1:45 - 2:50	Unit 1: Research Defined and Planning (cont'd) Activity 1.2: Hot Topics Influencers Unit 1: Research Defined and Planning (cont'd)	2:45 - 6:00	LRC Unit 2: Research Tools Instructor-led Research (until 6 p.m.)
2:50 - 3:00	<i>Break</i>		
3:00 - 3:45	Unit 1: Research Defined and Planning (cont'd)		

Day One Homework:
Find and read articles (for Activity 1.5)

Day Two Homework:
A. Fishbone Diagram
B. Failure Modes and Effects Analysis Worksheet
C. Writing Your Research Project Request

HOT TOPICS RESEARCH IN EMERGENCY MEDICAL SERVICES

SCHEDULE

TIME	DAY THREE	TIME	DAY FOUR
8:20 - 9:30	Instructor Facilitated Discussion on Home Agency Hot Topics	8:00 - 9:30	Instructor Facilitated Discussion on Home Agency Hot Topics
9:30 - 9:40	<i>Break</i>	9:30 - 9:40	<i>Break</i>
9:40 - 11:15	Unit 2: Research Tools Activity 2.1: Green World and Burnout	9:40 - 10:30	Unit 2: Research Tools (cont'd)
		10:30 - 10:40	<i>Break</i>
11:15 - 12:00	Unit 2: Research Tools (cont'd)	10:40 - 11:35	Unit 2: Research Tools (cont'd)
12:00 - 1:00	<i>Lunch Break</i>	11:35 - 12:45	<i>Lunch Break</i>
1:00 - 2:25	Unit 2: Research Tools (cont'd) Activity 2.2: Stakeholder Needs and Requirements	12:45 - 2:05	Unit 2: Research Tools (cont'd)
2:25 - 2:35	<i>Break</i>	2:05 - 2:20	<i>Break</i>
2:35 - 6:00	Unit 2: Research Tools (cont'd) Activity 2.3: Contextual Analysis Unit 2: Research Tools (cont'd) Instructor-led Research (until 6 p.m.)	2:20 - 6:00	Activity 2.4: Search Tactics Exercise Activity 2.5: Guided Search Tactics Instructor-led Research (until 6 p.m.)

Day Three Homework:
D. Venn Diagram
E. Common Research Steps

Day Four Homework:
F. Second Project Proposal

SCHEDULE

TIME	DAY FIVE	TIME	DAY SIX
8:00 - 9:30	Instructor Facilitated Discussion on Home Agency Hot Topics	8:00 - 9:00	Presentations
9:30 - 9:40	<i>Break</i>	9:00 - 9:10	<i>Break</i>
9:40 - 10:55	Unit 3: Literature Review and Evaluation Activity 3.1: Evaluating an Abstract	9:10 - 10:20	Presentations
10:55 - 11:05	<i>Break</i>	10:20 - 10:30	<i>Break</i>
11:05 - 12:00	Unit 3: Literature Review and Evaluation (cont'd)	10:30 - 12:00	Presentations
12:00 - 1:00	<i>Lunch Break</i>	12:00 - 1:00	<i>Lunch Break</i>
1:00 - 2:00	Activity 3.2: Evaluate Gathered Materials	1:00 - 2:15	Presentations
2:00 - 2:10	<i>Break</i>	2:15 - 2:30	<i>Break</i>
2:10 - 6:00	Activity 3.3: Literature Review Unit 4: Documenting Research Activity 4.1: Modes of Writing Instructor-led Research (until 6 p.m.)	2:30 - 5:00	Course Evaluation and Graduation

This page intentionally left blank.

FIREFIGHTER CODE OF ETHICS

Background

The Fire Service is a noble calling, one which is founded on mutual respect and trust between firefighters and the citizens they serve. To ensure the continuing integrity of the Fire Service, the highest standards of ethical conduct must be maintained at all times.

Developed in response to the publication of the Fire Service Reputation Management White Paper, the purpose of this National Firefighter Code of Ethics is to establish criteria that encourages fire service personnel to promote a culture of ethical integrity and high standards of professionalism in our field. The broad scope of this recommended Code of Ethics is intended to mitigate and negate situations that may result in embarrassment and waning of public support for what has historically been a highly respected profession.

Ethics comes from the Greek word ethos, meaning character. Character is not necessarily defined by how a person behaves when conditions are optimal and life is good. It is easy to take the high road when the path is paved and obstacles are few or non-existent. Character is also defined by decisions made under pressure, when no one is looking, when the road contains land mines, and the way is obscured. As members of the Fire Service, we share a responsibility to project an ethical character of professionalism, integrity, compassion, loyalty and honesty in all that we do, all of the time.

We need to accept this ethics challenge and be truly willing to maintain a culture that is consistent with the expectations outlined in this document. By doing so, we can create a legacy that validates and sustains the distinguished Fire Service institution, and at the same time ensure that we leave the Fire Service in better condition than when we arrived.



FIREFIGHTER CODE OF ETHICS

I understand that I have the responsibility to conduct myself in a manner that reflects proper ethical behavior and integrity. In so doing, I will help foster a continuing positive public perception of the fire service. Therefore, I pledge the following...

- Always conduct myself, on and off duty, in a manner that reflects positively on myself, my department and the fire service in general.
- Accept responsibility for my actions and for the consequences of my actions.
- Support the concept of fairness and the value of diverse thoughts and opinions.
- Avoid situations that would adversely affect the credibility or public perception of the fire service profession.
- Be truthful and honest at all times and report instances of cheating or other dishonest acts that compromise the integrity of the fire service.
- Conduct my personal affairs in a manner that does not improperly influence the performance of my duties, or bring discredit to my organization.
- Be respectful and conscious of each member's safety and welfare.
- Recognize that I serve in a position of public trust that requires stewardship in the honest and efficient use of publicly owned resources, including uniforms, facilities, vehicles and equipment and that these are protected from misuse and theft.
- Exercise professionalism, competence, respect and loyalty in the performance of my duties and use information, confidential or otherwise, gained by virtue of my position, only to benefit those I am entrusted to serve.
- Avoid financial investments, outside employment, outside business interests or activities that conflict with or are enhanced by my official position or have the potential to create the perception of impropriety.
- Never propose or accept personal rewards, special privileges, benefits, advancement, honors or gifts that may create a conflict of interest, or the appearance thereof.
- Never engage in activities involving alcohol or other substance use or abuse that can impair my mental state or the performance of my duties and compromise safety.
- Never discriminate on the basis of race, religion, color, creed, age, marital status, national origin, ancestry, gender, sexual preference, medical condition or handicap.
- Never harass, intimidate or threaten fellow members of the service or the public and stop or report the actions of other firefighters who engage in such behaviors.
- Responsibly use social networking, electronic communications, or other media technology opportunities in a manner that does not discredit, dishonor or embarrass my organization, the fire service and the public. I also understand that failure to resolve or report inappropriate use of this media equates to condoning this behavior.

Developed by the National Society of Executive Fire Officers

GRADING METHODOLOGY

Homework Assignments

All homework assignments are individual assignments. Each homework assignment should be turned in first thing in the morning of the following day and placed in the box labeled “Assignments” in the back of the classroom. The instructors will read and comment on students’ work during the next day’s class session. Instructors will remind students that they should upload their work onto the classroom J-shared drive. At the end of the course, students should download all of the other students’ completed projects.

Each evaluated assignment receives a score. The criteria used to determine these scores are

10 - On time; assignment questions/tasks addressed with appropriate thoroughness and depth.

8 - On time; assignment questions/tasks addressed with moderate depth and thoroughness.

6 - Late; or assignment questions/tasks addressed with appropriate or moderate depth and thoroughness.

3 - Late; and/or assignment questions/tasks addressed with minimal depth or thoroughness.

1 - Late and incomplete.

0 - Assignment not turned in.

Consideration will be made in the following areas:

1. Did the student comprehensively answer the assigned questions?
2. Did the student comprehensively address all issues associated with his or her response?
3. As a professional, is the student writing at a collegiate level using appropriate grammar, punctuation and spelling?

As you evaluate projects throughout the course, your emphasis should be on ensuring that your comments are positive, diagnostic and corrective.

1. By “positive” is meant that you should use care in your wording selection. Some communication theorists believe that any message should both start and end with some type of positive comment.
2. By “diagnostic” is meant that you clearly indicate (again, in a positive and constructive manner) where and how the assignment fell short.
3. By “corrective” is meant that you specifically describe what the student must do with the assignment to bring it up to a “passing level.”

Note: Use the included Grading Sheet for official record keeping of students’ scores. Turn the Grading Sheet and Student Final Project grading pages in to the Training Specialist at the conclusion of the course.

This page intentionally left blank.

NFA EMS HOT TOPICS PROJECT INTRODUCTION

What follows is pertinent information on the research project and proposal for EMS Hot Topics.

1. Overview

Each student will work on a research problem/concern/issue that he or she has identified that is within the realm of his or her responsibility. The project should be able to be completed within six months to one year.

2. Divisions

The work is divided into sections that are completed each evening of Days One to Five. This evening work taken collectively becomes the major portion of the final briefing on Day Six. At the end of each class day, the instructor will review the work (i.e., proposals, job aids, charts and graphs) that must be completed that evening and turned in the next morning. If you are asked for more information or to revise your material, that must be completed and returned to the instructor that same day.

3. Briefing

On Day Five or Six, each student will make a 10-minute briefing with a five-minute question and answer session on his or her research proposal. Some flexibility may be needed on the last few class days. Instructors will adjust content, as needed, to ensure that students have sufficient preparation time for their presentations.

4. Format

The format of the evening work assignments is included at the end of the last unit of each work day. For example, the evening work assignment for Day One is included at the end of Unit 1: Research Defined and Planning.

The format should be followed in completing each day's assignment, using the provided assignment sheets, found in the SM appendix. Be sure to include your name on the form.

5. Methodology

Each student works independently on his or her project. Collaboration between students, their "home" agencies, other students on campus, LRC staff, etc. can be useful and is encouraged. Students turn their completed work assignments in each morning on Days Two to Five. There will be a box labeled "Assignments" in the back of the classroom for that purpose.

- a. The instructors will review students' assignments, making any constructive comments they feel are needed. Often instructors will request clarifications and/or further information. This additional information must be returned to the instructor no later than the end of that same class day.
- b. Each evaluated assignment receives a score. The criteria used to determine these scores are
 - 10 On time; assignment questions/tasks addressed with appropriate thoroughness and depth.
 - 8 On time; assignment questions/tasks addressed with moderate depth and thoroughness.
 - 6 Late; or assignment questions/tasks addressed with appropriate or moderate depth and thoroughness.
 - 3 Late; and/or assignment questions/tasks addressed with minimal depth or thoroughness.
 - 1 Late and incomplete.
 - 0 Assignment not turned in.

- c. Students will give a 10-minute briefing with an additional five minutes for questions and answers on Day Six (or potentially beginning the afternoon of Day Five, for large classes). The briefing will describe the research proposal and upcoming “next steps” to implement the changes/improvements needed. In essence, each of the evening assignments will result in the final briefing; there is a direct connection between what is done in the evening assignments and the final presentation. The format should be followed using the provided assignment sheets, found in the SM appendix. Be sure to include your name on each item handed in.
- d. Instructors will share grade sheets, including any comments/recommendations, with the student after completion of the briefing and grading. A “sign-up sheet” will be posted at the end of Day Four so that students can determine who will present first, second and so on.
- e. All students’ projects will be electronically provided on the J-shared drive or copied for each student and provided at the end of the class.

6. Final Course Grade

The student’s final grade for “Hot Topics Research in Emergency Medical Services” will be computed as follows:

Assignment points (XX assignments up to 10 points each) + Final Project points (up to 10 points x3) =
Grade

90-100 = A

80-89 = B

70-79 = C

----- Passing = 70

60-69 = D

0-59 = F

This page intentionally left blank.

Hot Topics Research in EMS Project Status Briefing Grade Sheet

Student Name: _____

Course Date: _____

	Meets expectations	Minor recommendations	Moderate recommendations	Significant recommendations	Incomplete	
	10/9	8	7	6	5-0	Mark
Technical Content						
1. The student presented consequences of status quos.						
2. The student presented a stakeholders list.						
3. The student presented a SMART projected proposal.						
4. The student presented a fishbone diagram and/or Venn diagram and/or Failure Modes and Effects Analysis chart.						
5. The student presented sources, with examples, and elaborated on one source.						
Presentation Time (minutes)	9 – 11	8 or 12	7 or 13	6 or 14	<5 or >15	
The student's presentation was 10 minutes.						
					Total:	
Final grade:						

Comments/Recommendations: _____

(continue on reverse if necessary)

Instructor: _____

Instructor: _____

This page intentionally left blank.

A Student Guide to End-of-course Evaluations

Say What You Mean ...

Ten Things You Can Do to Improve the National Fire Academy

The National Fire Academy takes its course evaluations very seriously. Your comments and suggestions enable us to improve your learning experience.

Unfortunately, we often get end-of-course comments like these that are vague and, therefore, not actionable. We know you are trying to keep your answers short, but the more specific you can be, the better we can respond.



Actual quotes from student evaluations:	Examples of specific, actionable comments that would help us improve the course:
1 "Update the materials."	<ul style="list-style-type: none"> The (ABC) fire video is out-of-date because of the dangerous tactics it demonstrates. The available (XYZ) video shows current practices. The student manual references building codes that are 12 years old.
2 "We want an advanced class in (fill in the blank)."	<ul style="list-style-type: none"> We would like a class that enables us to calculate energy transfer rates resulting from exposure fires. We would like a class that provides one-on-one workplace harassment counseling practice exercises.
3 "More activities."	<ul style="list-style-type: none"> An activity where students can physically measure the area of sprinkler coverage would improve understanding of the concept. Not all students were able to fill all ICS positions in the exercises. Add more exercises so all students can participate.
4 "A longer course."	<ul style="list-style-type: none"> The class should be increased by one hour per day to enable all students to participate in exercises. The class should be increased by two days so that all group presentations can be peer evaluated and have written abstracts.
5 "Readable plans."	<ul style="list-style-type: none"> The plans should be enlarged to 11 by 17 and provided with an accurate scale. My plan set was blurry, which caused the dotted lines to be interpreted as solid lines.
6 "Better student guide organization," "manual did not coincide with slides."	<ul style="list-style-type: none"> The slide sequence in Unit 4 did not align with the content in the student manual from slides 4-16 through 4-21. The instructor added slides in Unit 4 that were not in my student manual.
7 "Dry in spots."	<ul style="list-style-type: none"> The instructor/activity should have used student group activities rather than lecture to explain Maslow's Hierarchy. Create a pre-course reading on symbiotic personal relationships rather than trying to lecture on them in class.
8 "More visual aids."	<ul style="list-style-type: none"> The text description of V-patterns did not provide three-dimensional views. More photographs or drawings would help me imagine the pattern. There was a video clip on NBC News (date) that summarized the topic very well.
9 "Re-evaluate pre-course assignments."	<ul style="list-style-type: none"> The pre-course assignments were not discussed or referenced in class. Either connect them to the course content or delete them. The pre-course assignments on ICS could be reduced to a one-page job aid rather than a 25-page reading.
10 "A better understanding of NIMS."	<ul style="list-style-type: none"> The instructor did not explain the connection between NIMS and ICS. The student manual needs an illustrated guide to NIMS.

This page intentionally left blank.

UNIT 1: RESEARCH DEFINED AND PLANNING

TERMINAL OBJECTIVES

The students will be able to:

- 1.1 *Apply research techniques to develop a research design that supports a hot topic for Emergency Medical Services (EMS).*
- 1.2 *Locate relevant data whether the data is paper-based or found in some other media type.*

ENABLING OBJECTIVES

The students will be able to:

- 1.1 *Apply commonly used steps for performing research.*
 - 1.2 *Define the basic elements of research.*
 - 1.3 *Explain the importance of research in the identification of “Hot Topics Research in Emergency Medical Services” and associated issues.*
 - 1.4 *Explain the benefits and importance of planning research.*
 - 1.5 *Identify important contextual issues that impact and influence EMS issues.*
 - 1.6 *Identify national EMS concepts and main issues needing research.*
 - 1.7 *Identify the audience and their needs and requirements in planning research.*
 - 1.8 *Define and create a search strategy.*
 - 1.9 *Frame the topic to be researched.*
 - 1.10 *Formulate a plan for research.*
 - 1.11 *Demonstrate the use of paper-based tools in research.*
-

RESEARCH DEFINED AND PLANNING

- 1.12 *Demonstrate research skills in applying the appropriate research methodologies using different types of media.*
- 1.13 *Identify the laws, standards, regulations and other legislation relevant to EMS and their accompanying authorities.*
- 1.14 *Explain the structure of commonly used databases and other research tools.*
- 1.15 *Discuss the advantages of using a database for research purposes.*
- 1.16 *Read, interpret and apply EMS research, human behavior studies, EMS law and emerging issues.*
- 1.17 *Identify emerging local, regional and state EMS equipment and challenges.*
- 1.18 *Locate federal, local and state resource environments for EMS laws and regulations.*

ENABLING OBJECTIVES (cont'd)

- Identify the audience and their needs and requirements in planning research.
- Define and create a search strategy.
- Frame the topic to be researched.
- Formulate a plan for research.
- Demonstrate the use of paper-based tools in research.

Slide 1-4

ENABLING OBJECTIVES (cont'd)

- Demonstrate research skills in applying the appropriate research methodologies using different types of media.
- Identify the laws, standards, regulations and other legislation relevant to EMS and their accompanying authorities.
- Explain the structure of commonly used databases and other research tools.

Slide 1-5

ENABLING OBJECTIVES (cont'd)

- Discuss the advantages of using a database for research purposes.
- Read, interpret and apply EMS research, human behavior studies, EMS law and emerging issues.

Slide 1-6

**ENABLING OBJECTIVES
(cont'd)**

- Identify emerging local, regional and state EMS equipment and challenges.
- Locate federal, local and state resource environments for EMS laws and regulations.

Slide 1-7

I. NATIONAL EMS RESEARCH AGENDA

**NATIONAL EMS RESEARCH
AGENDA**

- Published in 2001.
- Designed to elevate the science of EMS.
- Will take prehospital care to the next level.
- Practices to be evaluated.
- Procedures to be improved.
- Calls for a large cadre of EMS investigators.

Slide 1-8

A. The “National EMS Research Agenda.” The types of Emergency Medical Services (EMS) research are clinical systems education.

1. “National EMS Research Agenda” published in 2001.
2. Designed to elevate the science of EMS.
3. Will take prehospital care to the next level.
4. Many practices to be evaluated. For example:
 - a. Advanced life support (ALS) engines.
 - b. C-Spine immobilization.

- 5. Many procedures to be improved.
 - a. Vehicle rescue.
 - b. Sepsis care.
 - c. 911 dispatching.

B. The “National EMS Research Agenda” calls for a large cadre of EMS investigators. This includes introducing research in initial education.

**NATIONAL EMS RESEARCH
AGENDA (cont'd)**

- Centers for excellence in EMS research to be developed.
- Federal and state agencies should support research in EMS.
- Higher standards of reporting evidence.
- Standardized data collection system.

Slide 1-9

- C. Centers for excellence in EMS research need to be developed. Currently there are few centers dedicated to this effort (examples: UCLA, University of Pittsburgh, University of Texas).
- D. Federal agencies should sponsor EMS research and states’ charitable organizations and corporations should support research in EMS.
- E. EMS professionals should hold themselves to higher standards of reporting evidence before implementing new procedures, devices or drugs.
- F. A standardized data collection system called the National EMS Information System is now in place to aid with EMS research with common definitions.
- G. Several great national efforts are under way. The Cardiac Arrest Registry for Effective Survival program from the Centers for Disease Control and Prevention (CDC) is one example.
- H. An investment in EMS research is necessary to overcome obstacles in EMS. The ever-shrinking government dollar will only be available for those practices and procedures that can show benefits and return on investment.

ACTIVITY 1.1

Values and Nominal Group Technique Exercise

Purpose

To identify the difference between value-driven topics and nominal technique topics needing research.

The nominal group technique (NGT) was developed as a possible alternative to brainstorming. This technique is a structured variation of small group discussion methods. The process prevents the domination of discussion by a single person, encourages the more passive group members to participate, and results in a set of prioritized solutions or recommendations.

Directions

1. You will have 10 minutes to examine a list of research topics, add or subtract from the list provided by your instructor, and rank your top five research topics. This is an individual exercise.
2. In your table group, share your list, consolidate duplicates and select the top three items.
3. Your group will select a speaker and report on your selections and why.
4. You will be provided with a total of eight dots. The dots are three different colors — green: five dots worth one point, blue: two dots worth five points, and red: one dot worth 10 points.
5. You will individually and anonymously vote for the best ones. Place a dot next to the topics of your choice (for example, the best idea gets the 10 points, next best five points, least one point). You can place as many or as few on each topic. You have 15 minutes to complete this step.

RESEARCH DEFINED AND PLANNING

	Potential Research Topics	Score
	Basic life support (BLS) versus ALS engines	
	Web-based versus server-based electronic Prehospital Care Report	
	Type of device for ePCR recording (Toughbook [®] , tablet, etc.)	
	Alternative continuing education delivery	
	Diesel versus gas ambulances	
	Utilization of intermediate life support ambulances	
	EMS protocol development	
	Selecting a medical director	
	Reimbursement	
	Developing a field training program	
	How to improve seatbelt usage	
	Ambulance purchasing	
	Electrocardiogram (EKG) monitor selection	
	Helicopter utilization (local, regional, statewide)	
	Response times	
	Dual paramedic versus paramedic EMT crews	
	Shift lengths (e.g., 8, 12, 16, 24, 48 hours)	
	Prehospital hypothermia therapy	
	Airway management	
	Worker safety	

II. ENVIRONMENTAL SCANNING

ENVIRONMENTAL SCANNING

- Careful monitoring of organization's internal and external environments.
- External environment = operational environment.

Slide 1-12

- A. Environmental scanning is the careful monitoring of an organization's internal and external environments that helps to detect signs of opportunities and hazards that may influence current and future plans.

- B. The external environment relates to conditions, entities and factors that surround the organization and influence activities and choices, which in turn determine opportunities and risks. One might refer to this as the operational environment.

This page intentionally left blank.

This page intentionally left blank.

III. SCIENTIFIC METHOD

SCIENTIFIC METHOD

- A problem is first identified and observations, experiments or other relevant data are then used to construct or test hypotheses that purport to solve it.
- Other types of research analysis.
- International Organization for Standardization 9001.

Slide 1-14

- A. The scientific method of research is a method of investigation in which a problem is first identified and observations, experiments or other relevant data are then used to construct or test hypotheses that purport to solve it. It is simple and the universally accepted standard.

- B. Other types of research analysis are those associated with the American Heart Association and the National Institutes of Health (NIH). They have several levels (i.e., blinded, double-blinded, and randomized studies).

- C. International Organization for Standardization 9000 is commonly used to determine fault, failure analysis and other times when the system fails or needs to improve.
 - 1. International Organization for Standardization 9001, often called International Organization for Standardization 9000, represents a management methodology adopted by companies to deliver products and services that meet customer expectations.

 - 2. The International Organization for Standardization 9001 management philosophy bases its principles on the assumption that a company will deliver products and services of quality on a continuous basis if employees follow process instructions accurately.

KEY COMPONENTS OF THE SCIENTIFIC METHOD

1. Define your problem.
2. Perform literature review and form hypothesis.
3. Gather existing data.
4. Test hypothesis.
5. Analyze test data.
6. Evaluate research.

Slide 1-15

D. The scientific method focuses on proving or disproving the hypothesis. Here are the key components of the scientific method:

1. Define the problem.
2. Perform literature review and form hypothesis.
3. Gather existing data.
4. Test hypothesis.
5. Analyze test data.
6. Evaluate research.

THREE QUESTIONS RESEARCH ATTEMPTS TO ANSWER

- Descriptive:
 - Describes what's occurring or exists.
- Relational:
 - Looks at relationships between two or more variables.
- Causal:
 - Looks to identify if one or more variables causes or affects change to one or more other variables.

Slide 1-16

E. Three main types of questions that research attempts to answer:

1. Descriptive: describes what is occurring or currently exists.

2. Relational: looks at relationships between two or more variables.
 3. Causal: looks to identify if one or more variables causes or affects change to one or more other variables.
- F. These three types of questions build upon each other so that they are cumulative. A relational study assumes that the variables you are trying to relate can be described through measurement or observation. Likewise, a causal study assumes that the variables are related.
- G. As you formulate your position, you should understand your **point of view**.
1. This is the place from which you scrutinize people, events and/or details.
 2. This is how you look at something and how you see it.
 3. Many times your point of view is colored by experience or situations.
 4. These experiences and situations may distort your understanding or limit your perspective.
 5. Thinking adults have a willingness to examine viewpoints that are contrary to previous positions taken and when the evidence warrants a change from this position, accept the new viewpoint.
- H. Conducting good research incorporates several key characteristics:
1. The use of theories to guide learning about how the world operates.
 2. Empirical observation to measure the “reality” of the world around us.
 3. Understanding that we are searching for probabilistic (based on probabilities) explanations and that establishing certainty or “proving” anything is not possible.
 4. Look for causal relationships (cause and effect) to help identify ways we can change our world through improvement or elimination of waste or problems.
- I. A relational study looks for a correlation between two or more variables. A causal study seeks to identify that one or more variables causes or affects change to one or more other variables.

TWO TYPES OF VARIABLES DEFINED IN A STUDY

- Dependent variable:
 - Variable that is the focus of the study.
- Independent variable:
 - Variable that the researcher is applying in the study to cause a change to the dependent variable.

Slide 1-17

- J. There are two types of variables defined in a study: dependent and independent.
1. Dependent variable is the variable that is the focus of the study. It is the variable that a researcher is trying to influence or change.
 2. Independent variable is the variable that the researcher is applying in the study to cause a change to the dependent variable.
- K. Search multimedia materials — CD-ROMs, videos, audio tapes/recordings, podcasts.
- L. The “cup” analogy to understanding dependent versus independent variables.
1. Imagine the dependent variable as a cup. The cup is something solid, of a particular size, shape and weight. We can readily identify it as a cup.
 2. Now imagine the independent variable as something we put “in” the cup (e.g., water, sand, ice, hot tea, etc.).
 3. If we add water to the cup, the cup will get heavier and possibly develop condensation on the outside surface.
 4. If we add sand, the cup will again get heavier, but no condensation will occur.
 5. If we add ice, the cup gets heavier and gets cold to the touch.
 6. If we add hot tea, the cup gets heavier and becomes hot to the touch.
 7. Each of these items will create a particular change to the cup, but the cup still remains a cup. Therefore, each item created some form of change in characteristic to the cup, but the cup itself remained.

IV. COMMON STEPS USED IN RESEARCH

COMMON STEPS IN RESEARCH

1. Define your topic.
2. Collect/Find information.
3. Evaluate your information.
4. Use the information.
5. Cite your sources.
6. Refer to style guides.

http://www.lrc.fema.gov/research_fire.html

Slide 1-18

A. From the U.S. Fire Administration (USFA) Learning Resource Center (LRC) Fire Service Research Guide, the following have been identified as common steps used in research:

1. Define your topic.
2. Collect/Find information.
3. Evaluate your information.
4. Use the information.
5. Cite your sources.
6. Refer to style guides.

B. **Step 1, Define Your Topic.** Here are some questions you might ask to help you define your topic.

1. How do you select your general problem?
2. Has the problem been researched previously?
3. Have you reviewed the existing literature on the problem?
4. How do you specify the problem, question or hypothesis?
5. Do you have a design or methodology in mind?

C. **Step 2, Collect/Find Information**, will take up a considerable amount of your time this week.

RELIABLE AND VALUABLE

- Educational sites (.edu).
- Governmental sites (.gov).
- Google's Government Search (<http://www.unclesamsearch.com>).
- Learning Resource Center's (LRC's) Google Custom Search Engine.
- Internet Public Library (<http://www.ipl.org>).
- Google Scholar (<http://scholar.google.com>).

Slide 1-19

D. Remember to use reliable Web pages and valuable search engines.

EVALUATION CRITERIA

- Authority.
- Reliability.
- Currency.
- Completeness.
- Original source.
- Intended audience.
- Relevancy.

Slide 1-20

E. In order to perform **Step 3, Evaluate Your Information**, you should consider certain evaluation criteria as you examine the collected information.

1. Authority: Who is the author? What are his or her credentials?
2. Reliability: Does the information seem accurate?
3. Currency: Is the information up-to-date?
4. Completeness: Is the information complete?
5. Is it a summary of some other work or original source?

6. Who is the intended audience?
7. Relevancy: Does the information gathered answer your question?

F. **Step 4, Use and/or Do Something With the Information**, will be the end product of this course.

STEP 5: CITE YOUR SOURCES

Elder, L., & Paul, R. (2007). *The thinker's guide to analytic thinking: How to take thinking apart and what to look for when you do*. Dillon Beach, CA: Foundation for Critical Thinking.

American Psychological Association. (2010). *Publication Manual of the American Psychological Association* (6th ed.). Washington, DC: Author.

<http://owl.english.purdue.edu/owl/section/2/10/>

Slide 1-21

G. **Step 5, Cite Your Sources**, encompasses both an ethical and legal responsibility.

1. Since you are collecting information to support your topic, it is in one sense an original work, but in another sense it is a compilation where you are using other authors' works to support your position or idea.
2. The data you gather speaks volumes; the data will support your argument one way or another — for or against.
3. Source citations provide supporting facts to your research, provide others with the ability to check your interpretation, provide credit where credit is due, and avoid the allegations of plagiarism.
4. You must reference the exact source from which the information came.
 - a. Citations should contain the following information:
 - Title of work.
 - Author(s).
 - Publishing information (date, publisher, city, state).
 - URL (if available and applicable).

- Digital Object Identifier.
- b. Use the material you collect in the proper manner.
- Do not engage in plagiarism and do not violate the Digital Millennium Copyright Act.
 - This act is a United States copyright law that implements treaties of the World Intellectual Property Organization.
 - It criminalizes production and dissemination of technology, devices or services intended to circumvent measures that control access to copyright works.
 - The Digital Millennium Copyright Act increases the penalties for copyright infringement on the Internet.
 - The law was passed in 1998 and signed into law by President Bill Clinton.
 - The Digital Millennium Copyright Act amended Title 17 of the United States Code to extend the reach of copyright, while limiting the liability of the providers of online services for copyright infringement by their users.
- c. Citations follow a set style so that others can quickly locate the resource and are considered part of the research “language.”
- American Psychological Association (APA) book citation contains:
- Author’s last name and initials, with the publish date within parentheses.
 - The complete book title is in italics.
 - City and state where published are separated from the publishing company by a colon.
 - The citation ends with a period.
- d. Following the book citation is a detailed description of the APA journal citation:
- Author’s last name and initials (publish date within parentheses).

- Article title is displayed in the normal font.
- Journal title is in italics, followed by volume number and issue number within parentheses and no space separating volume number from issue parentheses and then the page(s).
- The citation ends with a period.

STEP 6: STYLE GUIDES

- American Psychological Association (APA).
- Modern Language Association (MLA).
- Chicago Manual of Style.
- Turabian.

Slide 1-22

H. **Step 6, Refer to Style Guides**, is important.

1. There are multiple style guides, and you will want to use the one preferred by the organization you are submitting your paper to.
 - a. All citations should follow the organization’s designated style guide format for books and journals. There are four authoritative style guides.
 - APA.
 - Modern Language Association (MLA).
 - Chicago Manual of Style.
 - Turabian.
 - b. All are available on the LRC site.
2. The National Fire Academy (NFA) uses the *Publication Manual of the American Psychological Association*.
3. However, other style guides are available through the LRC.

V. BASIC RESEARCH VERSUS APPLIED RESEARCH

TYPES OF RESEARCH

- Basic — to expand knowledge.
- Applied — to solve practical problems.

Slide 1-23

A. The type of research you conduct usually falls under one of two types: basic or applied.

BASIC RESEARCH

- How did the universe begin?
- How has man evolved over time?
- How do humans interact with each other under certain conditions?

Slide 1-24

1. **Basic** (also referred to as fundamental or pure research) is driven by an individual’s curiosity or interest in a particular question.
 - a. The main motivation is to expand knowledge, not to create or invent something.
 - b. There is no obvious commercial value to the discoveries that result from basic research.
 - c. However, basic research lays down the foundation for the applied research that follows.

- d. Basic research usually entails a literature review of the work of others.

APPLIED RESEARCH

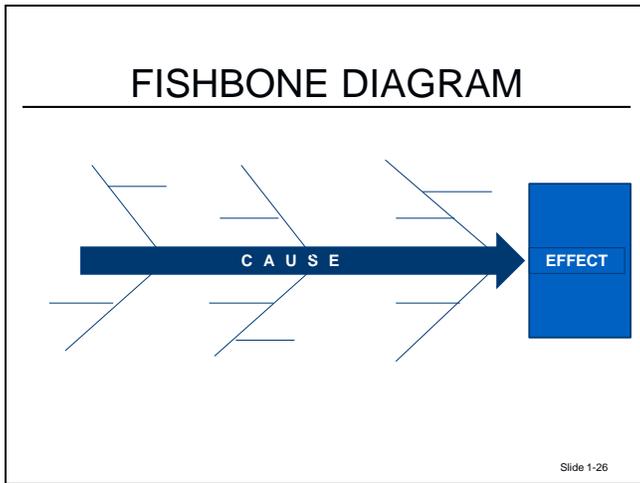
- Improve agricultural production.
- Get better gas mileage.
- Improve emergency response times.

Slide 1-25

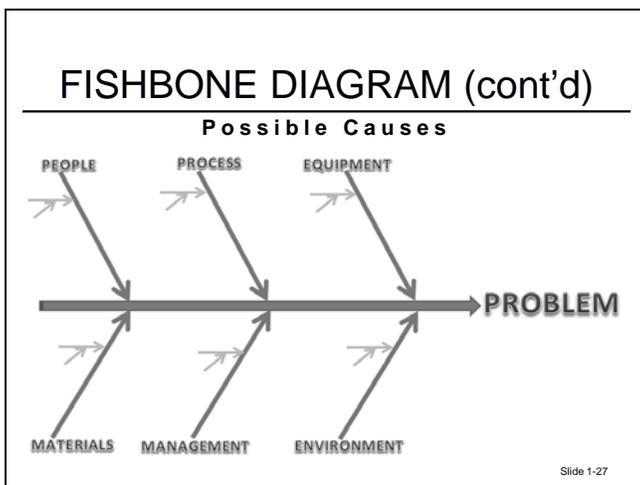
2. **Applied research** is designed to solve practical problems of the modern world, rather than to acquire knowledge for knowledge's sake. One might say that the goal of applied research is to improve the human condition.
- B. During the 1990s there occurred a blurring of the lines between these two types of research.
1. This happened when academic research institutions became funded by a variety of sources — public and private.
 2. Thus the stakeholders changed as did their attitudes.
 3. They expect that the knowledge generated will be both protected and exploited.
- C. International development and the online community make educational research available everywhere for everyone.
1. It is hard to keep projects under one discipline much less within one academic institution.
 2. We live in a global community where basic and applied researches run along the same or parallel paths.
- D. Why does someone do research?
1. Individuals or even groups perform research in order to explore new ideas for personal fulfillment.

2. Others perform research to evaluate products for performance, code or legal compliance.
3. Some perform research to validate decisions that have already been made, and some perform research to find design alternatives.
4. No matter what the reason behind the research, there has to be a plan.

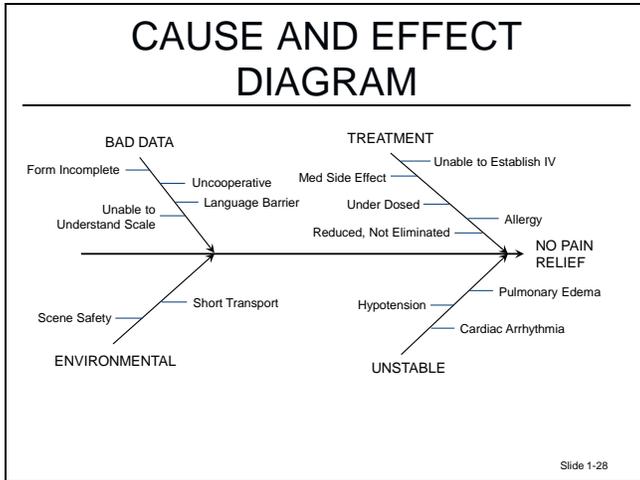
VI. FISHBONE DIAGRAM



- A. Many organizations use the fishbone diagram to systematically separate the contributing causes of the problem/issue being analyzed.
- B. But before we expand on causes, we need to distinguish between cause and effect.



- C. The causes vary, but some common categories are people, environment, methods, materials, machinery/equipment, policies and measurement.



- D. The number of categories used will be determined by the problem or issue.
- E. Preliminary data count of the frequency of each potential cause to see if any particular cause stands out as having the most impact on the effect.
- F. Once all the causes have been identified, the next step is to brainstorm solutions for each cause.
- G. Other consideration is the priority of causes to be solved.
- H. You may have to use multiple votes to determine this priority.

This page intentionally left blank.

ACTIVITY 1.3

Using the Fishbone Diagram

Purpose

The purpose of this exercise is to use a visual tool to dissect a problem and look at the factors that may help indicate the root cause(s) of a problem. Use a fishbone diagram to help illustrate a problem.

Directions

1. Your instructor will provide a large laminated fishbone to your group.
2. This activity guides you to participate in this approach (way of thinking) as a means of understanding a problem or issue.
 - a. You may not come to a solution.
 - b. It is the process that is important at this time.
3. You will use the fishbone diagram poster for your activity.
 - a. You will select a team scribe to perform fill-in on the diagram (add bones as necessary).
 - b. You should stick to the allotted time.
4. You should select a representative.

This page intentionally left blank.

HOMWORK A

Creating a Fishbone Diagram

Purpose

The purpose of this exercise is to use a visual tool to dissect a problem and look at the factors that may help indicate the root cause(s) of a problem. Use a fishbone diagram to help illustrate a problem.

Directions

1. Using your hot topic, complete the fishbone diagram located in your Student Manual (SM) appendix. There is also a fillable form available on J-shared drive, and you will be able to save your work there.
2. Turn in your homework assignment to your instructor by the start of class tomorrow.

This page intentionally left blank.

VII. FAILURE MODES AND EFFECTS ANALYSIS

FAILURE MODES AND EFFECTS ANALYSIS

- Failure Modes and Effects Analysis is a tool to:
 - Identify the relative task.
 - Initiate action to reduce risks.
 - Track the results.

Slide 1-31

- A. Every product or process has modes of failure. The effects represent the impact of the failures. A Failure Modes and Effects Analysis is a tool to:
1. Identify the relative risks designed into a product or process.
 2. Initiate action to reduce those risks with the highest potential impact.
 3. Track the results of the action plan in terms of risk reduction.
- B. A systematic methodology is used to rate the risks relative to each other. There are twelve steps to the Failure Modes and Effects Analysis process. They are:

FAILURE MODES AND EFFECTS ANALYSIS TWELVE-STEP PROCESS

1. Review the process.
2. Brainstorm potential failure modes.
3. List potential effects of failure.
4. Assign severity rankings.
5. Determine potential causes.
6. Assign occurrence rankings.

Slide 1-32

1. **Step 1: Review the process.**

Use a detailed flowchart of the process or another tool (maybe a fishbone) as a starting point to review the problem. By reviewing the process, you'll ensure you are studying all the components which could be impacting your problem. Document those problems in the "process step/input" column.

2. **Step 2: Brainstorm potential failure modes.**

Review existing documentation and data for clues. Consider the potential failure modes for each component and its corresponding function. A potential failure mode represents any manner in which the component or process step could fail to perform its intended function or functions. Be thorough with your list.

3. **Step 3: List potential effects of failure.**

Determine the effects associated with each failure mode. The effect is related directly to the ability of that specific component to perform its intended function. Be aware that some effects will impact the customer, the environment, a facility, the process itself, staff, etc. Use descriptive and detailed terms to define the effects.

4. **Step 4: Assign severity rankings.**

The severity ranking is an estimate of how serious an effect would be should it occur. Consider what the impact would be on the customer, staff, operations, the organization, etc. A "10" means the effect has a dangerously high severity leading to a failure without warning. A "1" means the severity is extremely low. Try to be consistent with your ratings.

5. **Step 5: Determine potential causes.**

Determine the potential cause or failure mechanism for each failure mode. There are many problem-finding and problem-solving methodologies. One of the easiest to use is the five-whys technique. Are you able to capture the frequency of the failures from your data?

6. **Step 6: Assign occurrence rankings.**

Just as in Step 4, estimate the severity of the cause based on the occurrence. Keep in mind the severity ranking is driven by the effect and the occurrence ranking is a function of the cause. The occurrence ranking is based on the likelihood or frequency that the cause or mechanism of failure will occur. Again use the 1 to 10 scale.

FAILURE MODES AND EFFECTS ANALYSIS PROCESS (cont'd)

- 7. Determine current controls.
- 8. Assign detection rankings.
- 9. Calculate the risk priority number (RPN).
- 10. Recommend actions, responsibility and timelines.
- 11. Actions taken.
- 12. Recalculate the resulting RPN.

Slide 1-33

7. Step 7: Determine current controls.

Are there existing controls that prevent either the cause or the failure mode? Controls cannot only prevent the cause or failure mode from occurring but can potentially detect a failure mode and even determine the cause of failure after it has occurred. Think of it like all the caution, warning and advisory symbols on the dashboard of an automobile.

8. Step 8: Assign detection rankings.

The purpose of assigning detection rankings is to evaluate the current process controls in place. The detection ranking scale, like severity and occurrence, is on a relative scale from 1 to 10.

9. Step 9: Calculate the risk priority number (RPN).

Severity x Occurrence x Detection = RPN. The RPN gives you the relative risk ranking. The higher the RPN, the higher the potential risk. The RPN also provides the user with a tool to prioritize and focus improvement efforts.

10. Step 10: Recommend actions, responsibility and timelines.

- a. Develop the action plan. The point is to reduce the RPN. The action plan should outline what steps are needed to implement the solution, who is responsible, and timelines. The RPN can be reduced by lowering any of the three rankings (severity, occurrence or detection) individually or in combination with one another. The severity rank reduction is often the most difficult. It usually requires a physical modification to a process, equipment or layout. Reduction in the occurrence ranking is accomplished by removing or controlling the potential cause.

- D. The RPN is a function of three factors: the severity of the effect, the frequency of occurrence of the cause of the failure, and the ability to detect (or prevent) the failure or effect.
1. $RPN = \text{severity rating} \times \text{occurrence rating} \times \text{detection rating}$.
 2. The RPN can range from a low of 1 to a high of 1,000.
- E. Once the RPNs are determined, you need to develop an action plan to reduce the risks of failure modes of unacceptably high RPNs.

This page intentionally left blank.

ACTIVITY 1.4

Failure Modes and Effects Analysis Exercise

Purpose

To provide the student an opportunity to use the Failure Modes and Effects Analysis worksheet.

Directions

1. Your table groups will be divided evenly into small groups of five or six members.
2. Using your previously assigned group topic, your group will develop a Failure Modes and Effects Analysis worksheet for your assigned topic.
3. The worksheet is available on the J-shared drive.
4. Using the computers in the classroom and breakout room, your group will develop a worksheet.
5. Upon completion, you will have an instructor-led discussion on the results of the worksheet.

This page intentionally left blank.

This page intentionally left blank.

HOMWORK B

Failure Modes and Effects Analysis Worksheet

Purpose

To use a visual tool to dissect a problem and look at the factors that may help indicate the root cause(s) of a problem. Use a Failure Modes and Effects Analysis worksheet to help illustrate a problem.

Directions

1. Using your hot topic, complete the Failure Modes and Effects Analysis worksheet located in your SM appendix. There is also a fillable form available on J-shared drive, and you will be able to save your work there.
2. Turn in your homework assignment to your instructor by the start of class tomorrow.

This page intentionally left blank.

HOMWORK C

Writing Your Research Project Request

Purpose

To apply research techniques to develop a research proposal that supports a topic in EMS.

Directions

1. You are going to write your first proposal based on the problem that you have identified through environmental scanning. There is a fillable form available on J-shared drive, and you will be able to save your work there.
2. Refer to Homework C: Writing Your Research Project Request in your SM appendix. Fill in all necessary blanks.
3. Use the breakout rooms where you are able to review the request and have access to a computer.
4. This is only a request.
5. Turn in a copy of your written request, with your name and title of the project, by the start of class tomorrow.

This page intentionally left blank.

VIII. REASONING AND INTELLECTUAL RELATIONSHIPS

REASONING STRUCTURE

- Purpose.
- Question.
- Assumptions.
- Point of view.

Slide 1-36

- A. All reasoning has a purpose.
 - 1. The clarity of your purpose is essential.
 - 2. The choice of significant and realistic purposes adds to its relevance.
 - 3. The purpose has functions, motives and intentions.

- B. All reasoning attempts to figure something out, to answer a question, or to solve a problem. State your issue clearly and precisely. If you can express it in multiple ways, you will clarify its meaning and scope. Attempt to divide your questions into three categories.
 - 1. Those having definitive answers.
 - 2. Those that are opinions.
 - 3. Those that require examination from multiple viewpoints.

- C. All reasoning is based on assumptions.
 - 1. Clearly identify assumptions.
 - 2. Determine whether justifiable.
 - 3. Consider how these assumptions influence your viewpoint.

- D. All reasoning reflects some point of view.
 - 1. Identify your viewpoint; seek other points of view.

2. Compare and contrast all viewpoints' strengths and weaknesses.
3. Strive to be fair-minded as you assess all points of view.

REASONING STRUCTURE
(cont'd)

- Based on data, information and evidence.
- Expressed through and shaped by concepts and ideas.
- Contains inferences or interpretations.
- Implications and consequences.

Slide 1-37

- E. All reasoning is based on data, information and evidence.
 1. Verify that your claims are supported by your data.
 2. Search for contrary information as well as supporting information.
 3. The information used should show clarity, be accurate and relevant to the issue.
 4. Gather sufficient information to cover the breadth of the issue.
- F. All reasoning is expressed through and shaped by concepts and ideas.
 1. Clearly identify key concepts.
 2. Examine alternative concepts or alternative definitions of these concepts.
- G. All reasoning contains inferences or interpretations by which conclusions are derived. Conclusions give meaning to the data. Infer only what the evidence implies. Check your inferences for consistency. Identify assumptions essential to your inferences.
- H. All reasoning leads somewhere, has implications and consequences.
 1. Trace the implications and consequences of your reasoning.
 2. Follow the negative as well as the positive implications.

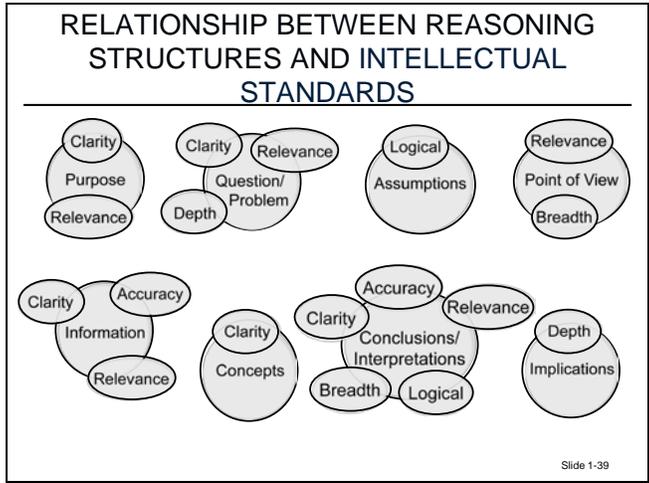
3. Consider all consequences.
- I. You have been gathering data.
 - J. You need to turn the data into information.
 1. Data are raw material and unorganized facts that need to be processed.
 2. Once data are processed, organized, structured or presented in a given context, you have information.
 3. Information provides answers to the questions who, what, where and when.
 - K. Your goal for this course is to produce a final program proposal/progress report that takes the data you have collected and formulates it into information with the result being knowledge about your chosen topic

Knowledge is the application of data and information such that it answers the “how” question.
 - L. You may be asking yourself, “By what standard or means, do I judge or evaluate what I have collected?”

SIX INTELLECTURAL STANDARDS
<ul style="list-style-type: none">• Clarity.• Accuracy.• Relevance.• Depth.• Logical.• Breadth.
<small>Slide 1-38</small>

- M. There are six intellectual standards you can apply.
 1. Clarity.
 2. Accuracy.
 3. Relevance.

- 4. Depth.
- 5. Logical.
- 6. Breadth.



N. Here's how the two relate to one another.

- 1. **Clarity:** Are the author's purposes, questions, information and conclusions clearly stated?
- 2. **Accuracy:** Is the information from which the author draws the conclusions accurate?
Are the author's interpretations true?
- 3. **Relevance:** Is the information presented relevant to the key questions and the author's primary purpose?
- 4. **Depth:** Do the author's answers address the complexities in the questions' issue?
Does the author's reasoning lead to significant and far reaching implications?
- 5. **Logical:** Does the author's reasoning make sense?
Do the conclusions follow from the information given?
- 6. **Breadth:** Does the author approach the issue(s) from multiple viewpoints (where relevant) or is the author's reasoning too narrow-minded?
Are opposing viewpoints offered?

ACTIVITY 1.5

Reasoning and Intellectual Relationships Exercise

Purpose

To demonstrate how the elements of thought apply to an article. The student should be able to identify the author's elements of thought within an article and apply the six intellectual standards of clarity, accuracy, relevance, depth, logic and breadth.

Critical thinking is the art of analyzing and evaluating thinking with a view to improving it. By applying the intellectual standards to the elements of thought we learn to develop intellectual humility, autonomy, integrity, courage, perseverance, empathy, confidence in reasoning and fair-mindedness. While most critical thinking concepts are intuitive, to integrate and apply these concepts consistently and rationally takes concerted effort, study and reflection. Just as professional athletes or musicians must practice to master their sport or art, so too must thinkers practice to master their minds. Everyone thinks; however, left to itself, it's biased, distorted, partial, uninformed or simply prejudiced.

Directions

1. Your table will be assigned an article.
2. You will read the article and reflect on the author's purpose, question or issue, information, interpretation, concepts, assumptions, consequences and point of view.
3. Your group will apply the intellectual standards of clarity, accuracy, relevance, depth, logic and breadth to the author's elements of thought.

Clarity

Understandable, the meaning can be grasped.

Could the author elaborate further, provide examples, illustrations, etc.?

Accuracy

Was the article free from distortion, errors and was it true?

How could the reader check it?

Verify or test the data?

Verify truthfulness?

Relevance

Does it apply to the matter at hand?

Is the author discussing apples while holding an orange?

How does the body of the article relate to the question posed? Does it help us understand the issue or question?

Depth

Does the author present complexities and interrelationships?

What factors make this a difficult problem or question?

What are some of the complexities of the problem or question?

What are some of the difficulties the author would have to overcome to provide more depth if needed?

Logical

Do all parts of the article make sense, fit together and not contradict?

Does it all make sense?

Does it pass the common sense test?

Does the first paragraph fit with the last?

Is what the author is presenting following or relating back to the evidence presented?

Breadth

Does the author encompass multiple viewpoints?

Does the author even consider other viewpoints?

After reading the article, do you find yourself seeking another's perspective on the question or problem presented?

Does this need to be simply looked at in other ways?

4. Document your group's finding on an easel pad.

This page intentionally left blank.

APPENDIX

HOMework ASSIGNMENTS

This page intentionally left blank.

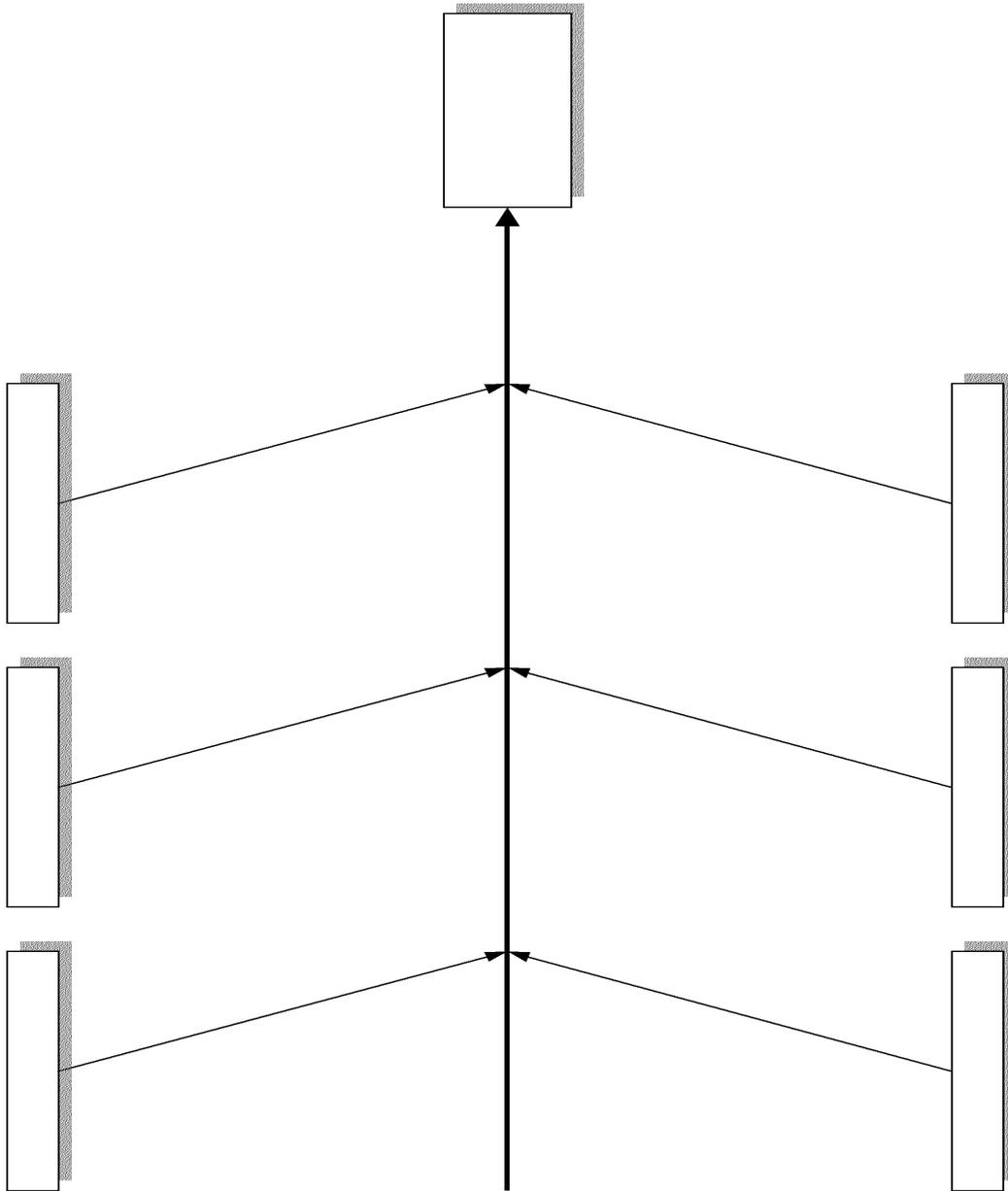
Homework A

Fishbone Diagram

Student Name: _____

Project Title: _____

Date: _____



This page intentionally left blank.

This page intentionally left blank.

Homework C

Writing Your Research Project Request

Student Name: _____

Project Title: _____

Date: _____

1. Specific:

Does your statement clearly define/depict the topic? Is the scope narrow enough? Is the topic within your area of expertise? The topic must be clear and unambiguous.

2. Measurable:

Can you objectively quantify your progress so you can track it? Define the criteria for measuring your data or information collected. How will it be documented? Is it specific enough? Is there some standard of measurement for your data such as response time, mileage, revenue, etc.

3. Attainable:

Is the proposal achievable? Are you authorized to approve the project? If not who is? Do you have the time, resources, personnel, etc.?

4. Realistic/Relevant:

Is this project relevant to what you want to achieve? How does this project align with the organization's goals or core values? Can the project be realistically completed with the resources available? Do you truly believe it can be achieved?

5. Time Bound:

Does your goal have a deadline? Are the timelines realistic? When will the project start and stop?

UNIT 2: RESEARCH TOOLS

TERMINAL OBJECTIVE

The students will be able to:

- 2.1 *Use the appropriate research tools to support their research strategy in addressing a hot topic in Emergency Medical Services (EMS).*

ENABLING OBJECTIVES

The students will be able to:

- 2.1 *List examples of commonly used research tools and media.*
 - 2.2 *Compare and contrast the advantages and disadvantages of using different research tools and media.*
 - 2.3 *Summarize the advantage(s) in using technology to enhance research.*
 - 2.4 *Identify the pros and cons of commonly used search engines available on the Internet.*
 - 2.5 *Explain how technology develops and can be transferred to solve local issues.*
 - 2.6 *Determine which sources are the most effective for the research.*
 - 2.7 *Locate information using information technology.*
-

This page intentionally left blank.



**UNIT 2:
RESEARCH TOOLS**

Slide 2-1

ENABLING OBJECTIVES

- List examples of commonly used research tools and media.
- Compare and contrast the advantages and disadvantages of using different research tools and media.
- Summarize the advantage(s) in using technology to enhance research.

Slide 2-2

**ENABLING OBJECTIVES
(cont'd)**

- Identify the pros and cons of commonly used search engines available on the Internet.
- Explain how technology develops and can be transferred to solve local issues.
- Determine which sources are the most effective for the research.
- Locate information using information technology.

Slide 2-3

I. LEARNING RESOURCE CENTER ORIENTATION

**LEARNING RESOURCE
CENTER ORIENTATION**

Slide 2-4

The Learning Resource Center (LRC) is an integral part of the National Fire Academy (NFA). This is your 24/7 everyday accessible library.

II. PLANNING A RESEARCH PROJECT

**PLANNING A RESEARCH
PROJECT**

- Not like planning a project.
- Examines how the study will be conducted.
 - Issues to be addressed.
 - Performing the research.
 - Test subjects.
 - Test subjects' privacy.
 - Collection methods used.

Slide 2-5

- A. Planning basic research is not like planning a project.
- B. Research design examines how the study will be conducted.
 - 1. What is the issue to be addressed?
 - 2. How will you go about performing the research?
 - a. Descriptive research: observing and describing what is currently going on without influencing in any way.

- b. Action: used to solve a problem.
 - Requires a product.
 - Change.
 - c. Historical.
 - Document events/conditions that occurred in the past.
 - Establish facts to arrive at conclusions concerning past events or predict future events.
 - d. Evaluate: assess or judge in some way providing useful information about something other than might be gleaned in more observation, investigation or relationships.
 - e. Experimental: systematic/scientific approach to research in which the researcher manipulates one or more variables.
3. If there are test subjects involved, what happens to them?
- a. Human Test Subject Protection Office for Human Research Protections within Health and Human Services.
 - b. The Belmont Report (<http://www.hhs.gov/ohrp/humansubjects/guidance/belmont.html>).
 - Issued in 1979 by the National Commission for the Protection of Human Subjects of Biomedical and Behavioral Research.
4. How is subjects' privacy protected?
- a. The Institutional Review Board (IRB) functions to ensure that human subjects are protected in biomedical and behavioral research.
 - b. IRBs fall under the auspices of the Food and Drug Administration (FDA) and the Department of Health and Human Services.
 - Local IRBs usually with teaching institutions.
 - IRBs are empowered to approve, require modifications to, or disapprove research.

- They examine the proposed research through scientific, ethical and regulatory criteria.
 - So now the question is “How do you protect the subjects’ privacy in an Emergency Medical Services (EMS) environment versus the hospital environment?”
5. What will be the methods used to collect data?
- a. Blinded.
- Pros of blinded data collection.
 - Study participants do not know who is or isn’t receiving the treatment or the placebo.
 - The researcher does know who is receiving either the treatment or the placebo.
 - Researcher aware of which participants to note for changes.
 - Study procedure error may be noticed and corrected/diverted before skewing study results.
 - Cons of blinded data collection.
 - Potential bias can be introduced by the researcher.
 - Can be difficult to conduct without participants realizing who is receiving the treatment versus placebo.
- b. Double-blinded.
- Pros of double-blinded data collection.
 - Introduction of researcher bias is greatly diminished.
 - Cons of double-blinded data collection.
 - Study procedure error may go unnoticed and skew final results.
 - Researcher unaware of which participants more/less likely to experience a change.

-- Can be difficult to design.

c. Randomized.

- Pros of randomized data collection.

-- Simple to implement.

-- Representative of a population.

-- Results can be generalized to the whole population.

-- Easy to explain to nontechnical audiences.

- Cons of randomized data collection.

-- Not as efficient as other methods.

-- Requires a sample list to select from.

d. Nonrandomized.

- Pros of nonrandomized data collection.

-- Simple to implement.

-- Results represent a specific group.

-- Easy to understand.

- Cons of nonrandomized data collection.

-- Results cannot be generalized to the whole population.

-- Likely to be biased.

PLANNING A RESEARCH PROJECT (cont'd)

- Match the strategy to the question when you plan or design your strategy.
 - Consider limitations and biases.
 - Identify, summarize and analyze previous research.
 - Research should show relationship.

Slide 2-6

- C. As you plan or design your strategy, make sure you match the strategy to the question so that the best answer is derived.
1. Take into consideration limitations and biases that may affect your interpretations.
 2. Identify, summarize and analyze previous research.
 3. Your research should show the relationship between your research and previous work, and you should define its purpose or the question as well as how you plan to test any hypotheses, if any exist.

RESEARCH PLAN

- Problem.
- Purpose.
- Question.
- Literature review.
- Data, information and evidence.
- Assumptions.
- Inferences and interpretations.
- Concepts/Ideas.
- Point of view/ Biases.
- Implications and consequences.
- Limitations.

Slide 2-7

- D. Your research plan should define or address the following:
1. Determine the problem.
 2. The purpose of your research.

3. The question being researched.
 4. Literature review.
 5. The data, information and evidence you hope to uncover.
 6. Assumptions — things that are accepted as true or as certain to happen without proof.
 7. Inferences and interpretations — a conclusion reached on the basis of evidence and reasoning. Interpretations — explaining the meaning of something.
 8. Concepts and ideas — an abstract idea or general notion.
 9. Your point of view and biases — may impact the outcome of the research project. It's important to identify and limit bias.
 10. Implications and consequences.
 11. Limitations.
- E. The purpose is your goal, your objective, what you want to accomplish.
1. It may include functions, motives or intentions.
 2. Your purpose should be clearly stated and justifiable.
- F. Your question describes the problem or issue.
1. It will guide your thinking.
 2. The statement of the question should be clear and precise.
 3. Avoid wordiness.
 4. Framing your question correctly is essential to getting the correct response.
 5. It defines the scope of the question being examined.

**FRAME THE QUESTION
CORRECTLY**

1. Why do advanced life support (ALS) engine companies make a difference?
2. How is ALS best delivered, and do ALS engine companies make a difference?
3. What are the strengths of ALS and ALS engine companies?

Slide 2-8

ACTIVITY 2.1

Green World Burnout

Purpose

This activity is designed to take the concept and distill it or narrow it down to measurable elements.

Directions

1. Everyone has heard others talk about two topics: Can an ambulance service go green? and Is there really such a thing as EMS burnout?
2. The class will be divided into two tables; one will consider greening an ambulance service, and the other will consider EMS burnout.
3. Each table will have 30 minutes to identify measurable items surrounding each concept.
 - a. Those considering the greening of an ambulance in the EMS community will focus on the question, “Can the EMS do anything to reduce its carbon footprint?” Consider these **green world** examples:
 - Electronic Prehospital Care Report that eliminates paper. Does the elimination of paper outweigh the cost for the wireless?
 - Hybrid truck chassis similar to Coca-Cola or FedEx that operates fleets with Freightliner chassis and Eaton drivetrain which makes it a hybrid electric truck. Does the cost per mile outweigh the cost of a specialized drivetrain?
 - Using alternative fuels such as biodiesel. Is there an increase in maintenance cost versus decrease in fuel costs?
 - Retrofitting facilities with solar, geothermal or compact fluorescent lights. When does the return on investment occur replacing solar panels on a fire or EMS station?
 - Solar roof panels to charge batteries and extend the life of ambulance alternators. What is the cost of a solar roof panel versus extended life on batteries in the cost of an alternator?
 - Consideration of federal and state incentives or grant opportunities.

- b. Those considering EMS burnout will focus on the question, “How can EMS reduce the occurrence of burnout by its personnel?” Consider these **burnout causal** examples:
- High-call volume. Is there a call volume identified with high rates of burnout?
 - Long shifts without adequate crew rest. Is there a specific shift or schedule that’s more conducive to wellness and reduces crew fatigue or burnout?
 - Absence of a career ladder. Is there an expected life expectancy for an EMS worker?
 - Family issues. Is an employee’s assistance program effective at reducing burnout or assisting with family stress?
 - Shift work. Does shift work cause us physiological changes that result in depression and burnout?
 - Poor management. What aspects of management influence employee burnout?
 - Unreasonable expectations of the workforce. Are new employees given the reality of the job?
 - Rustout versus burnout. Is there a threshold or a lower end of the spectrum for call volume that causes rustout or not running enough calls versus running too many calls?
4. At the end of the 30 minutes, each group will select a representative to report on the issues that the group identified that could be measured and accountable.
5. Select a representative who will present your plan.
6. Each presentation will take no more than five minutes.

II. PLANNING A RESEARCH PROJECT (cont'd)

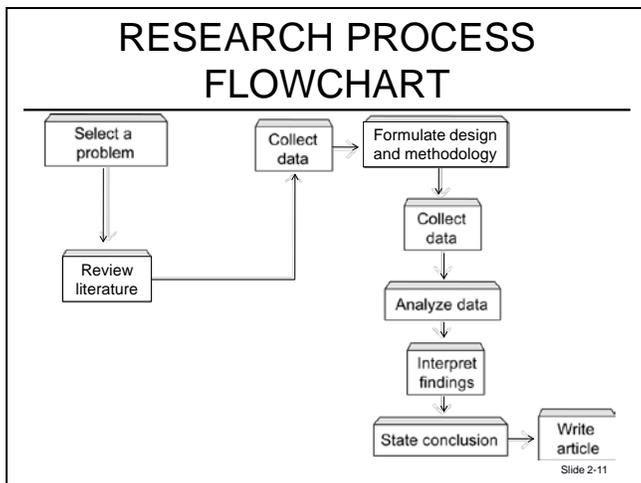
RESEARCH PLAN (cont'd)

- Purpose.
- Question.
- Data, information and evidence.
- Assumptions.
- Inferences and interpretations.
- Concepts/Ideas.
- Point of view/ Biases.
- Implications and consequences.
- Limitations.

Slide 2-10

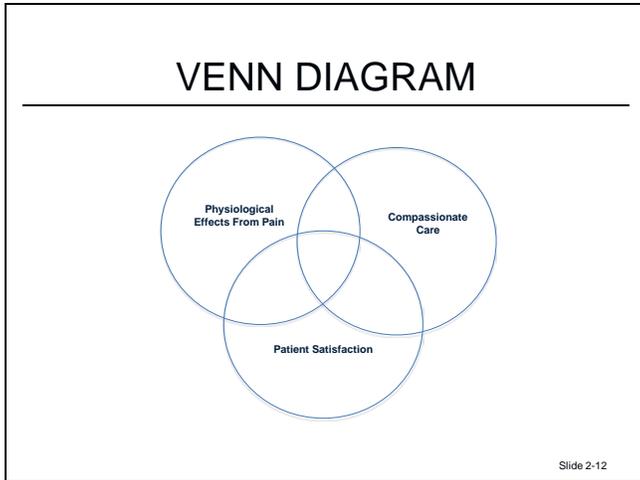
- G. Once your purpose and question are defined, you begin the process of gathering information (quantitative versus qualitative).
1. This information may be in the form of facts, data, evidence or experiences.
 2. The information gathered may or may not be accurate or correct.
 3. It may support or refute what you currently believe.
 4. Exercise intellectual integrity during the gathering activity.
 5. Later you will examine the relevancy and accuracy.
- H. As you examine your collected information, you should also examine your assumptions.
1. These are beliefs or ideas you hold and take for granted.
 2. Assumptions are often unconscious levels of thought that may exemplify prejudice, bias, stereotype and/or one-sided beliefs.
 3. Thus assumptions should be examined for their source and evidence of facts.
- I. Once the information is gathered, you will start making inferences.
1. These are your interpretations or conclusions you derive — what you figure out.

- 2. Inferences should refer back to or be supported by the evidence collected.
 - 3. Do not read things into your evidence!
- J. While examining your collected information, you should clarify underlying concepts.
- 1. These are ideas, theories, laws, principles or hypotheses used to gain an understanding of objects, things and/or events.
 - 2. The language chosen to state these concepts should exhibit care, be precise, demonstrate fairness, and be justifiable.
- K. Points of view and bias.
- L. You should consider the implications your position fosters. Implications are implied thoughts inferred or understood from some claim or truth.
- 1. There are two ways of looking at implications.
 - a. What will happen if you act?
 - b. What will happen if you do not act?
 - 2. Actions taken based on either implication are consequences.
- M. Limitations.



- N. Another way to look at the research process is through a flowchart, which provides guidance.

- O. Once you decide on a problem, you should check to see if someone else has looked at this problem — review the available literature.
1. How do you determine whether the articles you have found will suit your purpose?
 2. Thus you need to know **how** to read the collected literature.
- P. For each article you read, you should be able to identify the following items.
1. Why was the paper written? What does the article set out to demonstrate, prove, solve or describe?
 2. What method or approach was used to solve the problem? What variables were controlled, ignored or measured?
 3. What did the article report as the result of this study?
 4. What are the implications derived from the findings/results? What did the author put forth as his or her conclusion? How does this fit with what I know?
 5. One other consideration is the author's motivation for writing the article.
 - a. Why was the question asked?
 - b. Why is the problem important?
- Q. The use of domains (key areas) helps “scope” our project.
1. Allows categorization of the main ideas/ concepts/constructs to evaluate the literature.
 2. A Venn diagram allows for a quick visual of the domains.
 - a. Serves as a reminder of the focus for the research project.
 - b. Identifies how many (if any) of the domains the research article encompasses.
 - c. Each circle of the Venn diagram is a domain involved in your research project.
 - Where the circles overlap in the center of the diagram is your specific project.



d. Use the Venn diagram example supplied.

- Primary sources: articles that include all domains (center of the diagram).
 - Considered most relevant to your topic.
- Secondary sources: articles that only include two of the three domains.
 - Indirectly ties to current project but still relevant.
- Tertiary sources: articles pertaining to only one domain.
 - Commonly used to support a particular concept/construct but does not necessarily directly tie in to the current research project.

HOMWORK D

Venn Diagram

Purpose

Identifying a minimum of three domains of your individual project topic.

Directions

1. Using the Venn diagram located in Appendix A, identify a minimum of three domains to your individual topic. There is also a fillable form available on J-shared drive, and you will be able to save your work there.
2. Turn in a copy of your Venn diagram to the instructor before the start of class tomorrow.

This page intentionally left blank.

HOMEWORK E

Common Research Steps

Purpose

To apply commonly used steps for performing research.

Directions

1. Read through Homework Assignment E: Common Research Steps, located in Appendix A. There is also a fillable form available on J-shared drive, and you will be able to save your work there.
2. Turn in a copy of the worksheet to the instructor before the start of class tomorrow.

This page intentionally left blank.

III. ROLE OF THE STAKEHOLDER

ROLE OF THE STAKEHOLDER

- Stakeholders have vested interest in the outcome of the project.
- They can advance or hinder a project.
- Conduct a stakeholder analysis.
 - Identify opportunities or conflicts.

Slide 2-13

- A. Know your stakeholders — those persons who have a vested interest in the outcome of the problem, issue, concern or agenda.
- B. Stakeholders can advance or hinder your projects based on the stakeholders’ needs.
- C. Stakeholders can be internal (e.g., employees), external (e.g., patients) or both.
 - 1. Primary stakeholders are directly impacted.
 - 2. Secondary stakeholders are indirectly impacted.
- D. They hold varying degrees of power and influence over the organization’s objectives.
- E. Conduct a stakeholder analysis to determine:
 - 1. Their interests that may impact the project.
 - 2. Their potential conflicts or risks that could jeopardize the project.
 - 3. Opportunities and relationships that can be built to help the project’s success.
 - 4. Groups or individuals to encourage to participate in the project or stages of the project.
 - 5. Ways to reduce negative impacts on vulnerable or disadvantaged groups.
- F. The organization needs and relies on stakeholders.
 - 1. Gives them some say over the projects that may affect their lives.

2. Are essential for sustainability.
 3. Provides opportunities for learning on both sides.
 4. Builds capacity and enhances responsibility.
 5. Generates a sense of ownership.
- G. Stakeholders are concerned with organizational transparency, accountability, fairness and responsibility.
- H. Consider perceived perspectives, actual positions, and barriers that currently exist or may develop. It is important to identify and possibly address these before the project starts.

ACTIVITY 2.2

Stakeholder Needs and Requirements

Purpose

To discuss the role of stakeholder needs and requirements in planning research.

Directions

Part 1

1. Table groups will go to breakout rooms to conduct this activity.
2. Pick a person from your group to present identified stakeholders.
3. Answer the following question: How do stakeholder needs and requirements impact the development of your proposal?
4. Your response should include a general statement and then a supporting example.

Part 2

1. For each stakeholder identified, state at least one main need or characteristic that is important to:
 - a. What does the stakeholder expect to learn from your proposal?
 - b. Why is the stakeholder reading your proposal?
 - c. What is the stakeholder's current knowledge of the subject?
2. Other group members will provide feedback to each individual concerning his or her stakeholder list and needs/characteristics, as well as identify other potential stakeholders not already named.

This page intentionally left blank.

IV. CONTEXTUAL ISSUES

- A. Now that you have identified the role of the stakeholder audience, consider the contextual issues that impact and influence EMS issues.

- B. However, if you look at contextual analysis, where one attempts to gain a precise understanding of users' goals, tasks and conditions under which daily work is conducted, one can propose a model of behavior.
 - 1. You have to observe the person doing the job/task/activity in his or her normal environment (think: task analysis).

TASK VERSUS CONTEXTUAL ANALYSIS

Task Analysis

- Discern task knowledge.
- Object knowledge.
- Procedural knowledge.

Slide 2-15

- 2. During this observation, you try to discern the learner's task knowledge, object knowledge (equipment/gear/apparatus), and procedural knowledge (how to function in order to accomplish a task).
 - 3. You may have to observe the person multiple times in order to get the true picture.

- C. Consider the example of intubation, specifically facilitated intubation.
 - 1. Object knowledge refers to what someone knows about an object, piece of equipment, etc.
 - 2. Procedural knowledge is operating instructions, standard operating procedure (SOP), regulation, etc. associated with the entity.

TASK VERSUS CONTEXTUAL ANALYSIS (cont'd)

Identifies

- Bottlenecks.
- Work-arounds.
- Procedural exceptions.
- Error handling.
- Special concerns.

Slide 2-16

D. Additionally, your observations help to identify bottlenecks of work, existing work-arounds, and exceptions to procedures, error handling, and special concerns.

TASK VERSUS CONTEXTUAL ANALYSIS (cont'd)

Contextual Analysis

- Physical environment.
- User types.
- Roles.
- Tasks.

Slide 2-17

E. Thus, contextual analysis leads to an understanding of the physical environment, user types, roles and tasks.

TASK VERSUS CONTEXTUAL ANALYSIS (cont'd)

Identifies ideal user's

- Characteristics.
- Goals.
- Tasks.

Slide 2-18

1. Furthermore, contextual analysis may lead to development of an ideal user with specific characteristics, goals and tasks.
 2. This ideal may be referred to as the key learner/key source (accomplished performer).
- F. The results of contextual analysis and the identification of key user roles can be used to develop scenarios that are oriented toward the user's goals and designed to foster learner achievement.
1. Scenarios present concrete instances of how users accomplish a task and achieve their objectives.
 2. Such scenarios help to manage complexity and sharpen the focus on what really counts when the user interacts with the system.
 3. Scenarios grounded in the real world may suggest alternatives resulting in a change in the current process as future systems evolve. For example, consider the actions performed during intubation and how these actions are governed by object knowledge (person working on, such as adult or child or even the individual's condition) and procedural knowledge.

This page intentionally left blank.

ACTIVITY 2.3

Contextual Analysis

Purpose

To refine important contextual issues that impact and influence EMS issues. This activity is designed to examine a contextual item for the core idea or underlying issue that is the real or concrete issue.

Directions

1. Each table is assigned a contextual statement:
 - a. Group 1: We need advanced life support (ALS) engines.
 - b. Group 2: We need rapid sequence intubation.
 - c. Group 3: We need a heavy rescue.
 - d. Group 4: We need to be a sustainable and green EMS organization.
2. Using the contextual statement for your group, identify the following:
 - a. Is there an underlying issue(s) that is more important than the requested or defined problem(s)?
 - b. How would you redefine the problem statement?
3. Select a representative to make a two to three minute presentation to the entire group on the table's definition of a key source/learner.

This page intentionally left blank.

IV. CONTEXTUAL ISSUES (cont'd)

- G. What is a contextual issue versus the real issue?
 - 1. It's often not obvious.
 - 2. All the same basic information doesn't describe the problem.
 - 3. What is the purpose or a statement of the problem, issue or concern?

V. TECHNOLOGICAL ADVANCEMENTS

ADVANTAGES TO USING TECHNOLOGY

- 24/7 365 availability.
- Abstracts lead to full-text versions.
- Advanced search options.

Slide 2-20

- A. This idea of versatility covers open access resources that permit users to have a mobile repository online.
 - 1. A mobile repository allows access to their collected materials from wherever users are through any Internet connection (Web 2.0 tools).
 - 2. There are service-offering tools, such as del.icio.us, that manage your bookmarking and Citation Machine that formats citations in Modern Language Association (MLA), American Psychological Association (APA), Turabian, and Chicago styles.

ADVANTAGES TO USING TECHNOLOGY (cont'd)

- Versatility.
 - Online collaboration.
 - User groups (ICC).
 - Communities of practice (National Fire Protection Association (NFPA)).
 - Service-offering tools.
 - Web 2.0 tools.

Slide 2-21

3. Online collaboration is another aspect of versatility.
4. Research students can meet online to engage in group discussions, report status, brainstorm, give or receive clarifications and refinements, as well as prioritize the next steps in their common research project.

ONLINE RESEARCH TOOLS

- WWW research tools.
<http://www.virtualsalt.com/search.htm>
- Internet tools (iTools).
<http://www.itools.com/research>
<http://www.go2web20.net>
- Library of Congress research tools.
<http://www.loc.gov/rr/tools.html>
- National Archives.
<http://www.archives.gov/research/tools/>

Slide 2-22

- B. You do not live in a static world.
- C. Change is caused by many elements; some you may have control over and many you have no control over at all.

ONLINE RESEARCH TOOLS
(cont'd)

- University of California, Los Angeles Prehospital Care Research Forum.
<http://www.pcrf.mednet.ucla.edu/pcrf>
- Collaborative Institutional Training Initiative for Institutional Review Board (IRB) Training.
www.citiprogram.org/default.asp
- FISDAP.
<http://www.fisdap.net/home>

Slide 2-23

- D. One of the factors causing or influencing change is technology.
1. As you research your topic, look for a case or cases where technological advancement helped to solve a local problem or issue. What technological advance have you seen?

ONLINE RESEARCH TOOLS
(cont'd)

- PubMed.
<http://www.ncbi.nlm.nih.gov/pubmed/>
 - Medical literature search engine.
 - Tutorial.
 - Reference citation clipboard.

Slide 2-24

2. Along a similar vein, can you identify a problem or issue that can only be solved by technology?
- E. As technology develops and is implemented in one region, the community needs to share information and learn about technology-related efforts satisfying mutual interests.
1. Partnerships should be formed to pursue subjects of mutual interest.
 2. Collaboration efforts should be pursued, engaged in, and endorsed.
 3. This is not a new idea for the EMS community.

4. The following articles address the U.S. Research Forum and are provided to familiarize you with this topic.

VI. COMMON RESEARCH TOOLS

COMMON RESEARCH TOOLS

- Library/Librarian.
- Written materials.
 - Journals.
 - Known works.
 - Government records.
- Surveys.
- Interviews.
- Focus groups.

Slide 2-25

- A. Search library or get librarian to help you use the online card catalog.
- B. Search among written materials — indices, pathfinders, guides, treatises, online databases, known works.
- C. Conduct surveys and interview individuals or focus groups.
- D. There are information-gathering and decision-making online tools as well as free survey tools available to help with these types of activities.

**COMMON RESEARCH TOOLS
(cont'd)**

- Multimedia.
 - Video.
 - Computer-based trainings/Web-based trainings.
 - Podcasts.

Slide 2-26

- E. Search multimedia materials — CD-ROMs, videos, audio tapes/recordings, podcasts.

COMMON RESEARCH TOOLS
(cont'd)

- Internet.
 - World Wide Web.
 - Internet Public Library (ipl2).
 - Subscription databases.
 - Really simple syndication feeds.

Slide 2-27

- F. Search the Internet — databases, directories, wikis, blogs and RSS feeds.
- G. Be wary of news media articles; consider peer reviews of such.
 1. See comments about using journal and determining the difference between trade journals and scientific or refereed journals.
 2. There are too many items here to cover in detail.
 3. However, all are defined in the glossary, and we have provided useful URLs for you to use as references/resources in the appendix.
- H. Beware of the use of wikis and blogs; they are not edited or checked for validity as published materials are and are easily manipulated.

BLOGS

- “News” postings with readers’ comments.
- Main page features.
 - Date-based posting.
 - Organized in reverse chronological order.
- Readers comment on individual postings.
- Focus on **personal** insight, anecdote or opinion.
- Maintained by identifiable individual.

Slide 2-28

1. Blogs are generally news postings with readers’ comments. Note: This should not be used except in social science research.

- a. The main page features date-based postings that are arranged in reverse chronological order — newest at the top — but you can view the whole thread (term used for related communications on the same news item).
- b. Readers’ comments refute or support individual postings rather than the content of the news.
- c. Blogs focus on personal insight, anecdote or opinions.
- d. Blogs are usually maintained by an identifiable individual and are not edited by the public.
- e. Social Networks such as Facebook, YouTube and Twitter have blog-like features.

WIKIS

- Topic-based pages.
- Typical website login for editors and/or contributors.
- Comments on content.
- Less personal content.
- Maintained by numerous editors/contributors.
 - Not easily identified.
 - History viewable.

Slide 2-29

- 2. Wikis, on the other hand, are topic-based pages and are edited by groups of individuals who have gained permission to do so.
 - a. The site appears as a typical Web page; editors and contributors access the page via a login.
 - b. In wikis, the comments are on the content thus not as personal in nature.
 - c. Wikis are maintained by numerous editors or contributors who are not easily identified.
 - d. The public can submit edits.

LIBRARIES AND PUBLICATION CENTERS

- Paper-based materials remain valuable resources and are often overlooked in the local libraries.
- They contain online card catalogs and periodical indices.
- U.S. Fire Administration (USFA)/National Fire Academy (NFA) Publications Center.

Slide 2-30

- I. As you pursued your research, did you encounter sources that were not available online?
- J. Remember, paper-based materials remain valuable resources.
- K. Libraries are still your source for books, journal articles, and other print materials.
1. Libraries may even be your starting point.
 2. Libraries contain online card catalogs and periodical indices where you can search and access information by author, title or subject.
 3. Once you have located a few items, you can browse the footnotes or bibliographies for additional sources.
 4. Libraries provide you with the ability to browse the shelves for familiar collections, locate research guides, known works, and even glance at encyclopedias, if you just don't know where to start or your topic is too broad.
 5. Research librarians are there to assist you!
 6. Private libraries, fire stations, and specialty collectors.
 7. Good sources lead to good answers.
- L. The U.S. Fire Administration (USFA)/NFA Publications Center is a good source of paper-based materials as well as DVDs.
1. These materials are provided free of charge.
 2. You can search the online catalog from your home community.

3. While you're here, you may want to browse the facility.

SEARCH ENGINES' LIMITATIONS	
What they do	What they do NOT do
<ul style="list-style-type: none">• Locate, index, retrieve.• Assist in fact finding.• Locate known items.	<ul style="list-style-type: none">• Search entire Web.• Make Web a database.• Enable full-text searches.• Serve well for topical/ investigative research.<ul style="list-style-type: none">– Invisible Web.
Example: Lessons Learned Information Sharing (llis.gov)	
Slide 2-31	

M. Search engines have limitations.

1. While search engines are good at locating, indexing, and retrieving facts for product reviews, historical data, and known items, they are not so good in other ways.
2. Search engines do **not** search the entire Internet.
3. They do **not** turn the Web into a database.
4. Full-text searches are the exception, not the norm.
5. These characteristics limit topical or investigative research.
6. Search engines overlook listings that reside on secure sites or those accessible via registration or membership, have proprietary file formats, and information housed in many databases such as the Library of Congress, the Copyright Records database, or even MEDLINE. These spots are often referred to as the "Invisible Web." One such online resource is Lessons Learned Information Sharing (llis.gov).
7. Search engines and databases differ significantly.
8. It's the criteria; it's the purpose — who or what is being supported.
9. "Databases present an orderly means for storing, defining, and drawing relationships between data" (Tyburski).
10. The one similar characteristic is the keyword query used to access the data.

- a. These spots are often referred to as the “Invisible Web.”
- b. One such online resource is Ilis.gov.

FREE VERSUS FEE	
Free <ul style="list-style-type: none">• Less complete.• Dated/Timeliness.• Lacks authority.• Verification iffy.	Fee <ul style="list-style-type: none">• Resides in a familiar source.• Complete.• Current.• Authority verifiable.

Slide 2-32

- N. What about free versus fee-based Web listings?
 - 1. The first question you should ask is, “What is the intended use of this found information — tidbit for Jeopardy or professional journal?”
 - 2. There is no free lunch; so what are the trade-offs?
 - 3. Free information may be incomplete, only an abstract without access to the source.
 - 4. The information may be dated, too old to serve as support for your position.
 - 5. The author may not be disclosed or if known, his or her credentials may be lacking.
 - 6. Valuable time may be wasted as you try to locate the original source and verify the credentials establishing the author as an authority.

- O. You may recognize the fee-based information source; perhaps you’ve used it before or it has been suggested or referred by a colleague or friend.
 - 1. Familiarity may make it easier to use and give you the opinion that it is trustworthy.
 - 2. You may find the information complete, timely, and the author is identified with supporting credentials.

3. The only question to ask is, “Does the ease of use and data’s potential integrity justify the cost?”
4. What is the intended use — tidbit for Jeopardy or professional journal?

SEARCHING VERSUS RESEARCH	
Searching	Research
<ul style="list-style-type: none">• Uses one or more databases, search engines/metasearch sites.• Limits scope of information available.	<ul style="list-style-type: none">• Uses variety of techniques.• Requires viewing various media formats.• Time-consuming.

Slide 2-33

- P. A related question regarding fee-based materials is, “Are they available somewhere else?”
1. Is the journal subscribed to by an organization to which you belong?
 2. Is the journal available at the library?
 3. Are the resources of nearby trade schools or institutions of higher education accessible?
 4. Perhaps the material can be found on different media, such as CD/DVD, podcast, video, etc.?
 5. Would a news source help locate/define the current issue?

**SEARCHING VERSUS
RESEARCH (cont'd)**

Searching

- Faster.
- Lacks completeness.
- Serves select information needs.

Research

- Uses newly discovered information to focus/ redefine research.
- Serves all information needs.

Slide 2-34

Q. In summary, research requires an understanding of the issue and identification of potential sources of information.

1. Keyword search is useful for finding potential sources.
2. Investigating these sources is where research takes over.
3. Does the source provide an overview of the topic or provide in-depth coverage?
4. As you consult these sources, can you characterize your research techniques as systemic, diligent, creative and thorough?

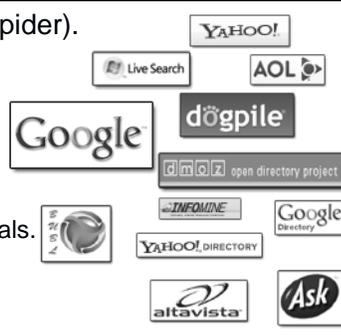
R. Where does one start?

VII. ONLINE TOOLS

- A. Search engines are the primary means by which one moves around the World Wide Web.
- B. Most people do not even think about the type of search engine they are using — in fact, you may be thinking, “There’s more than one kind?”

TYPES OF SEARCH ENGINES

- Crawler-based (spider).
 - Marketing.
 - Pay-Per-Click.
 - Paid Inclusion.
- Directories.
 - Academic and professional.
 - Commercial portals.



Slide 2-35

1. There are two basic types of search engines: crawler-based and directories.
 2. The difference is how the data is gathered.
- C. Crawler-based search engines have three parts.
1. The spider or crawler.
 2. The index.
 3. The search engine software.
- D. The spider visits a Web page, reads it, and follows links to other pages and repeats these activities.
1. Everything the spider uncovers on the Web pages is recorded in the index or catalog.
 2. Google, Yahoo, Windows Live Search and AOL Search are examples of crawler-based search engines.
- E. Directory search engines depend on humans for their listings.
1. Sometimes this type of search engine is referred to as a subject directory.
 2. It is a service offering a collection of links to Internet resources submitted by site creators or evaluators and organized into subject categories, which are arranged from general to more specific topics.
 3. Directory search engines are most useful when doing topic-based research.

4. Yahoo Directory, Open Directory, AltaVista, Ask.com, INFOMINE, and BUBL LINK are examples of directory search engines.
- F. Beware of the advertising elements on result pages. Two such Internet attributes are Pay-Per-Click and Paid Inclusions.
- G. No matter which search engine is used, you are looking for primary sources' sites to gather your materials.
1. Primary sources are the journals and books where academics and scientists publish the results of their experiments and studies.
 2. INFOMINE provides a search of scholarly literature across many disciplines and sources, including theses, books, abstracts and articles.
 3. Seek government websites and those managed by organizations.
- H. Subject directories are either academic/professional directories or commercial portals.
1. Academic directories tend to be associated with libraries or academic institutions and are created to enhance the research process and provide high quality sites of interest.
 2. INFOMINE and BUBL LINK are examples of academic directories.
 3. The selection criteria for subject directories differ substantially.
 4. Academic directories vet their entries while anyone can submit a site to commercial portals without any verification of the content.
 5. Pick your search directories carefully.
- I. Commercial portals have two purposes: to make money and to serve the public.
1. They link to a wide range of topics and emphasize entertainment, commerce, hobbies, sports, travel, etc.
 2. Yahoo Directory is perhaps the most famous commercial portal.
- J. As you travel around the Web, you visit Web pages and encounter Web portals.
1. A website is a location on the World Wide Web. The site is characterized by a home page, and the site is owned and managed by an individual, company or organization.

2. A Web portal is composed of large multiservice websites designed to be a comprehensive one-stop destination for users. The National Emergency Training Center's (NETC's) LRC site is a portal.

VIII. DATABASES

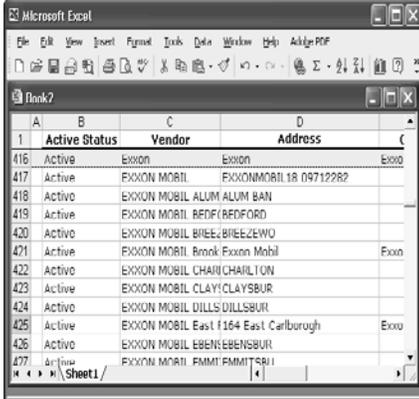
DATABASE COMMON TERMS

- Fields.
- Rows.
- Columns.
- Tables.
- Indices.

Slide 2-36

- A. Up to this point, this course has mentioned the use of databases but has not explained their structure.
- B. Databases are hierarchical in nature.
- C. There are two basic types of databases: flat and relational.

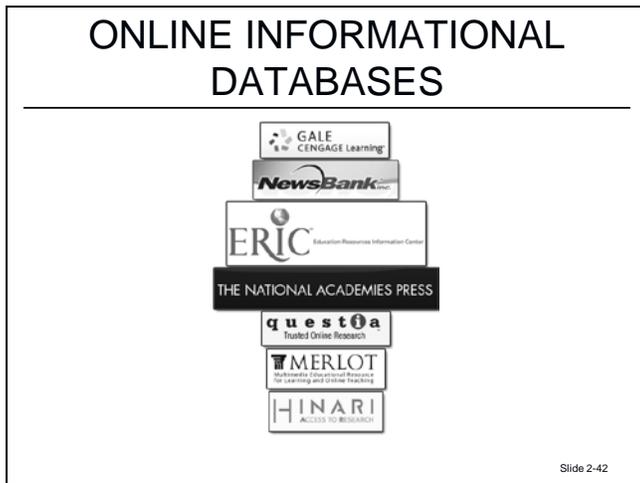
- Flat database is a single file that often resembles a table.



Slide 2-37

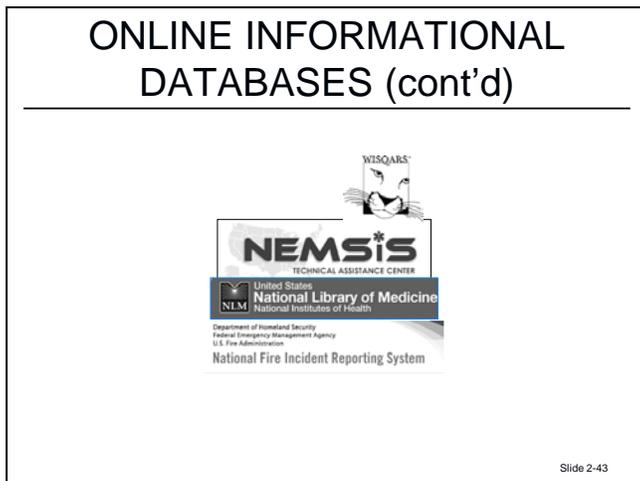
1. Flat database is a single file that often resembles a table. Rows normally represent individual records while columns represent defined fields.

- a. Books.
 - b. Journals.
 - c. Web pages.
 - d. Newspaper articles.
 - e. Conference proceedings.
5. Who is the publisher? Is it an academic or commercial publisher?
 6. What is the span of time covered? What publication years are covered?
 7. What is the update schedule (daily, monthly, quarterly, etc.)?



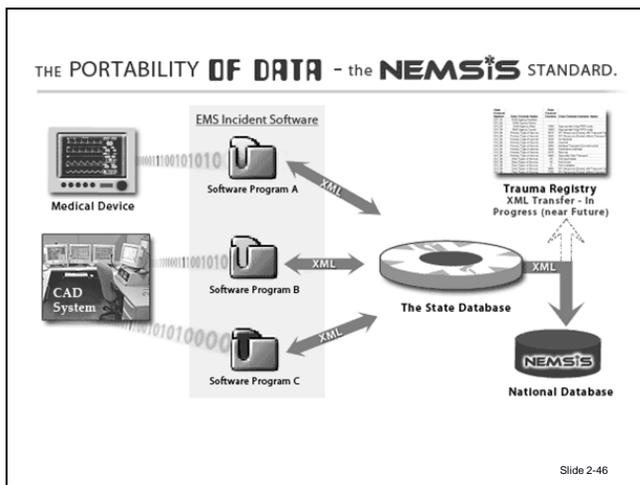
- J. Another source of online information is informational databases.
1. Some are free to all, some are free through an association like a school or university, and some are fee-based.
 2. The advantage of using searchable databases is that professionals have reviewed and indexed items whose content have merit.
 3. A list of informational databases follows.
 - a. Gale Group full-text articles from journals <http://www.gale.cengage.com/>.
 - b. Newsbank: news articles: <http://www.newsbank.com/>.

- c. Education Resources Information Center: sponsored by the U.S. Department of Education: <http://www.eric.ed.gov/>.
- d. National Academies Press: publishes reports from the National Academy of Sciences, the National Academy of Engineering, the Institute of Medicine, and the National Research Council: <http://www.nap.edu/>.
- e. Questia: full text of books, journal articles, magazine articles, and newspapers: <http://questia.com/>.
- f. Multimedia Educational Resource for Learning and Online Training: <http://www.merlot.org/merlot/index.htm>.
- g. World Health Organization's Health InterNetwork Access to Research Initiative: <http://www.who.int/hinari/en/>.



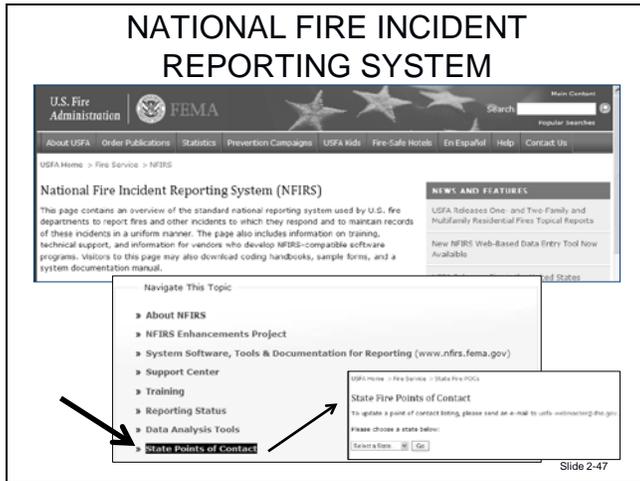
- h. National EMS Information System: offers technical assistance on the implementation and tracking of national EMS data: <http://www.nemsis.org/>.
- i. Centers for Disease Control and Prevention's (CDC's) Web-based Injury Statistics Query and Reporting System: interactive database system providing customizable reports for injury-related data: <http://www.cdc.gov/injury/wisqars/index.html>.
- j. MEDLINE: National Library of Medicine's premier bibliographic database covering the fields of medicine, nursing, the health care systems, preclinical sciences, etc: http://www.nlm.nih.gov/databases/databases_medline.html.

2. The NEMSIS project contains data collected from local and state agencies across the nation.
3. The goal is to define EMS and prehospital care in a way that will define a standard for measuring care, improve patient care, and help to develop EMS curricula.
 - a. States and agencies can selectively choose what elements (data fields) they want to collect.
 - b. However, the majority of the national elements are items commonly found on patient care reports.
 - c. Thus, no additional work is placed on local and state agencies — the data is currently being collected.



4. NEMSIS provides for data portability.
 - a. The format chosen by NEMSIS permits data transfer from the dispatch center, the mobile data terminal, the electrocardiogram machine, and/or the electronic patient care report.
 - b. The local collection can be transferred up to the state database and then on to the national database.
 - c. Laterally, the data can move sideways to trauma registries, highway safety databases, and hospital or public health records.
5. The goals of NEMSIS are to:
 - a. Implement an electronic EMS data collection system in every local EMS system.

- b. Implement a state EMS information system in every state and territory, which can receive and use a portion of the local EMS data via an Extensible Markup Language standard.
- c. Implement a national EMS database, which can receive and use a portion of the state and territorial EMS data via the XML standard.



- N. The NFIRS was updated to version 5.0 in December 2010.
- 1. This database maintains records of fires and other incidents that the fire service responds to in a uniform manner.
 - 2. It also includes information on training and technical support.
 - 3. NFIRS collects information on a full range of fire department activity.
 - 4. Even though the information is fire-based, data collected includes a module on EMS, hazardous materials, apparatus and personnel.
 - 5. Some of the features in the current NFIRS system are:
 - a. Address field permits computerized queries and street-based address matching for Geographic Information System (GIS) purposes.
 - b. Captures carbon monoxide incidents.
 - c. Ability to capture one-time information for special studies purposes.
 - d. Small spills of common hazardous materials are quickly and easily documented.

- e. Fire service resources for apparatus and personnel are grouped by use at the incident.
 - f. Provides expanded casualties information to better understand the nature and cause of injuries.
6. NFIRS is a client/server software application with many capabilities.
- a. States can edit and operate their databases through the federal website with the same functionality as if it were on their own network.
 - b. Separate Web-based utilities enable the transfer of data files collected with third-party software.
 - c. Another tool provides summary and statistical reports on state and fire department data saved in the national database.
 - d. NFIRS Web-based online reporting, queries, and GIS services improve state offices' capabilities.
7. You may determine your state's points of contact by selecting the link off the NFIRS home page.

IX. SEARCH TACTICS

SEARCH TACTICS

- What is a search tactic?
 - Method for how you will look for information.
- Why should we use one?
 - To get better results.

Slide 2-48

- A. What is a search tactic?
- B. A search tactic is a method for how you will look for information.
- C. Why should we use one?

- D. The more thought you put into the tactic, the better the results — more relevant data — without wasting time visiting pages that do not satisfy your needs.
- E. These tactics apply to searches for all media — Web, databases and printed materials.

SEARCH TACTICS STEPS

- Analyze your topic, question or problem.
- Identify keywords.
 - Precise words/common phrases.
 - Synonyms/Acronyms.
 - Variants.

Slide 2-49

- F. Here are five steps that you should use to develop your tactic.
 - 1. Analyze your topic, question or problem.
 - a. Can you write your topic, question or problem in one or two sentences?
 - b. You do this to organize your thoughts.
 - c. Are you confused and don't know where to start?
 - d. Go back to the basics, open an encyclopedia or talk to a librarian.
 - e. Ask an expert or refer to a known work on your subject.
 - 2. Identify keywords.
 - a. Select precise words or common phrases where word order is important.
 - b. Use synonyms, plural/singular forms (man, men), spelling variations (American English versus the Queen's English), and acronyms.

SEARCH TACTICS STEPS (cont'd)

- Use word truncation (*, ?, +).
- Perform searches in chains/progressions.
- Use browser's advanced search capability.
 - Use Boolean operators (AND, OR, NOT).
- Use the proper vehicle.

Slide 2-50

3. Use word truncation.
 - a. Examine each keyword for root variations and utilize truncation symbols, such as the question mark, the asterisk, and the plus sign, to retrieve all variant forms of the root word, e.g., “paramed” retrieves paramedical, paramedic and many, many more.
 - b. Keywords and word truncation work for search engines and online databases.
4. Perform searches in chains or progressions. This type of search may help you identify additional keywords, phrases or concepts.

TRIMMING UNIFORM RESOURCE LOCATORS EXAMPLES

Slide 2-51

5. Another idea related to chains is “trimming” URLs.
 - a. Suppose you find an interesting page and the URL is exceedingly long; trim off a short part of it (between the last two forward slashes) and press enter.

- b. Where does this new URL take you?
- c. Does it have related material for your search?
- d. Did you get a 404 message?
 - You may encounter such a message if the page is restricted.
 - Do not be dismayed; just continue your trim.
- e. Trimming can be done repeatedly.



- G. Use browser's advanced search capability or Boolean operators to connect words and concepts.
 - 1. These fields are common to whatever search engine you favor.
 - 2. No matter which search engine you use, check out the advanced search tips to learn how the advanced search works — if there is something special about it.
 - 3. Notice that you can search for multiple words, exact phrases, and can even eliminate words.
 - 4. A Boolean search allows users to combine keywords with operators such as **and**, **not** and **or** to further produce more relevant results. For example, a Boolean search could be “hotel” AND “New York.” This would limit the search results to only those documents containing the two keywords.

BOOLEAN EXAMPLES

- “Alternative fuels” AND “EMS equipment”
197 listings in results — w/o quotes 38,100.
- “Helicopter EMS” OR “HEMS Safety”
48,500 listings in results.
- “Helicopter EMS” OR “HEMS” NOT
combination — 702 listings in results.

Slide 2-53

- H. The advanced search capability of the browser utilizes Boolean operators: **and**, **or** and **not**.
1. When you type two words in the search line, the search engine looks for both words in the document usually in the order given.
 - a. This is the Boolean operator **and**.
 - b. The exact phrasing line would be similar to placing words between double quotes in the search line (when you do not use the advanced feature).
 - c. This is not an unwanted action.
 2. The line using **or** will find these words anywhere on the page in any order.
 - a. This technique expands your search capability.
 - b. Eliminating words avoids extraneous material.
 - c. Consider whether these words enhance or impede your search: ambulance driver, harness, restraint, medical sports, NASCAR and vehicle.
- I. The fields following “Need more tools?” are self-explanatory and choices are selected from the options provided by the associated menus.
- J. If you do not use the browser advanced search capability, you can enter the Boolean operators yourself.
1. This is just a small example, and your use will depend on your personal comfort level.

2. “AND” typed in all capitals between the words will search for the words in the order given and found together (beside one another) on the page and only report those pages in the result.
3. “OR” typed in all capitals between the words will search for either of the words on the page and reports those pages in the result.
4. Placing each keyword, phrase and concept within double quotes will help your computer process the request.
5. “NOT” typed in all capitals between words excludes the word it comes before in the result.
6. This will help you eliminate or lessen the number of irrelevant pages in your resulting search.
7. There are more Boolean operators, but these are the most common.



- K. Use the proper vehicle.
1. If your topic is broad, you will find that a Web or subject directory is the place to start.
 2. Web directories may not give you lots of references, but the references given will have a greater relevance factor.
 3. If your topic is narrow and seeks specific information, then a Web search engine is your starting point.
 4. More detail on Web directories, search engines, and databases will be addressed later.

5. Whenever you find a relevant record or one that appears to be, use it as a source for additional information.
6. Catalog and database records are organized by subject headings and descriptors; these give you alternative search terms.
7. Use the references and bibliographies found attached to academic resources for your own purposes.
8. This is why you perform multiple searches; you are approaching your topic, question or problem from many directions.

RESOURCES AND TIPS

- Searching WWW.
- Searching Learning Resource Center (LRC) online catalog.
 - <http://www.lrc.fema.gov/>
- Searching for Executive Fire Officer (EFO) papers.
 - <http://www.lrc.fema.gov/>
- Video tutorials.
 - <http://netc.worldcat.org/>

Slide 2-55

- L. There are additional searching tips that are available on the Web.
1. You are also encouraged to access the tips offered by the search engine you favor.
 2. Don't overlook the Executive Fire Officer (EFO) research papers housed on the LRC site.

**RESOURCES AND TIPS
(cont'd)**

- International Association for Fire Safety Science — <http://www.iafss.org>
- USFA/NFA Publications Center — <https://www.apps.usfa.fema.gov/publications>

Slide 2-56

This page intentionally left blank.

ACTIVITY 2.4

Search Tactics Exercise

Purpose

To use Internet-based and other technology tools to locate data sources.

Directions

1. Determine which sources will be most effective for your personal research.
2. Begin your research using your developed search tactic.
3. Using your Better Searching Worksheet, query Emergency Medical Services. Use Google advanced search.
4. Document the number of matches as you change the search parameters.
5. Note how the number of matches changes and becomes narrower.

This page intentionally left blank.

ACTIVITY 2.4 (cont'd)

Better Searching Worksheet

Query	# Matches
Emergency Medical Services	
Emergency Medical Services fire	
Without volunteers	
Emergency Medical Services safety	
Without helicopter	
Without helicopter flight	
"Emergency Medical Services" protocols	
Language = English	
United States	
Domain = .gov	
"Emergency Medical Services" regulations	
Language = English	
United States	
Domain = .gov	
"Emergency Medical Services" ambulance	
Date = past year	
Without fire	

Query	# Matches
<p>“Emergency Medical Services” ambulance</p> <ul style="list-style-type: none"> • Find pages similar to this search: type “related:” prior to the search item • Find pages linked to pages you have already found useful, precede the search item with “linked to:” 	
<p>“Emergency Medical Services” videos Without YouTube</p>	
<p>Practice Trimming using following URL whose focus is Culture Change.</p> <p>Type this line in the URL address area and then press Enter: http://humanresources.about.com/od/organizationalculture/a/culture_change_2.htm</p> <p>Notice that there are five sections to the URL.</p> <p>Starting at the right side of the URL</p> <ol style="list-style-type: none"> 1. Remove the last part (up to the first slash from the right) and press Enter. <ol style="list-style-type: none"> a. You have a new whole source of articles related to culture. 2. Remove the next part (up to the next slash from the right) and press Enter. <ol style="list-style-type: none"> a. Here is another viable site. 3. Remove the next part and press Enter. <ol style="list-style-type: none"> a. Nothing happens — we seem to be stuck. b. Remove the next section (up to /od/) and press Enter. c. Once again, a viable site. 4. Remove the last part and press Enter. <ol style="list-style-type: none"> a. You are at the initial site. 	

ACTIVITY 2.5

Guided Search Tactics

Purpose

To define and create a search strategy.

Directions

1. First, we are going to perform this exercise together.
2. Next, use the topic your group was assigned earlier.
3. Identify the concepts and ideas that could be used to spearhead the search (circle words).
4. Make a list of keywords using concepts/ideas found in Step 1 as well as variants, synonyms and truncation.
5. Write one example for each of the Boolean operators: AND, OR, NOT.
6. Decide which vehicle (search engine or directory) should be employed first when conducting the search.

This page intentionally left blank.

ACTIVITY 2.5 (cont'd)

Guided Search Worksheet

1. Are there associated words, phrases or concepts that could be found in titles or headings? Examine your summary statement for different ideas that would compose a unique search. Identify the concepts and ideas that could be used to spearhead the search (circle the words).

Would you classify the research item as broad or narrow? _____

Are there hierarchical relationships within the concepts/ideas? If so, what?

2. Make a list of keywords using:
- a. Unique precise words or common phrases where word order is important (e.g., “fire protection systems” — **note:** the use of double quotes indicates grouping and order).

b. Synonyms _____

c. Variants _____

d. Truncation

- The **question mark** (?) affixed to word’s foundation (root) will result in spelling variations, e.g., firefight? retrieves fire fighting, firefight, firefighter and many, many more.

- The **asterisk** (*) is a wildcard for missing word(s), e.g., EMS* VA would result in any occurrence of EMS and VA in the same sentence with many variations of intervening words.
 - The **plus sign** (+) looks for both words occurring on the same page but not necessarily found together, e.g., fire + protection + systems which is different from “fire protection systems” where the three words must be found together on the page in this order.
-
-
-

3. Perform searches in chains or progression. Try different angles/approaches. Try a variety of search engines, subject directories, known works, and assorted guides.
-
-

4. Write (at least) one example for each of the Boolean operators.

Note: Not all search engines and directories use Boolean operators in the same way. Read the “**search help**” or “**advanced help**” section found on the website to retrieve more from that website.

AND _____

OR _____

Placing each keyword, phrase and concept within double quotes will help your computer process the request.

NOT _____

Use of NOT helps you eliminate or lessen the number of irrelevant pages in your resulting search.

5. Decide which vehicle (search engine or directory) should be employed first when conducting the search.

This page intentionally left blank.

HOMWORK F

Second Project Proposal

Purpose

To apply research techniques to develop a research proposal that supports a topic in EMS.

Directions

1. Using the proposal template form, fill in each section as appropriate.
2. Refer to Homework F: Second Project Proposal located in Appendix A to guide the writing of the proposal template. There is also a fillable form available on J-shared drive, and you will be able to save your work there.
3. Use the breakout rooms where you will review your draft proposal and have access to a computer.
4. Turn in a copy of your proposal with your name and title of the project to your instructor before the start of class tomorrow.

This page intentionally left blank.

This page intentionally left blank.

APPENDIX A

HOMEWORK ASSIGNMENTS

This page intentionally left blank.

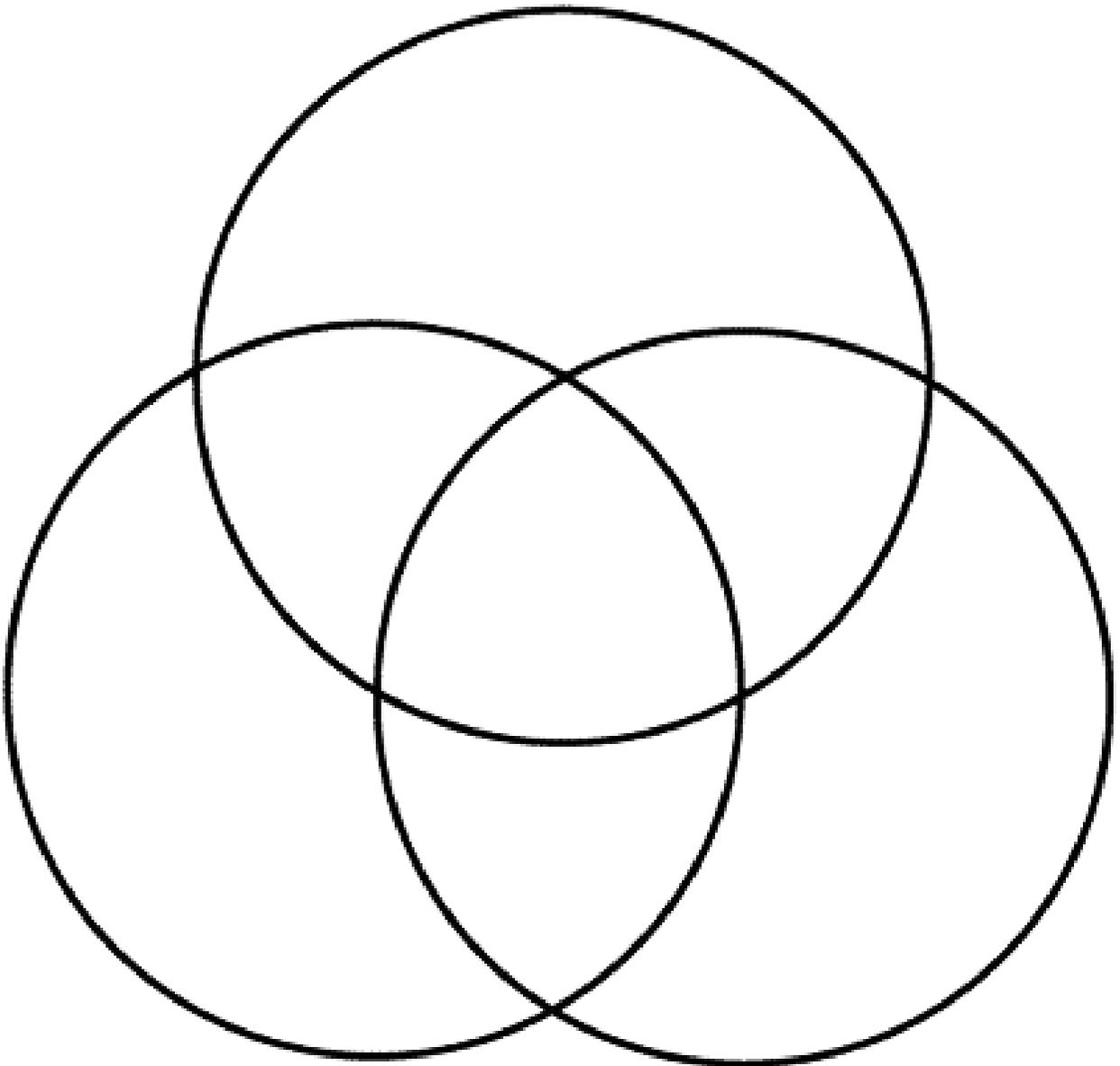
Homework D

Venn Diagram

Student Name: _____

Project Title: _____

Date: _____



This page intentionally left blank.

Homework E

Common Research Steps

Student Name: _____

Project Title: _____

Date: _____

Step 1: Define Your Topic

Here are some questions you might ask to help you define your topic.

- What is the problem or issue?

- Has the problem been researched previously?

- Have you reviewed the existing literature on the problem?

Step 2: Collect and Find Information

Remember to use reliable Web pages and valuable search engines. Here are just a very few to get you started.

- Educational sites (.edu)
 - Government sites (.gov)
 - LRC's Google Custom Search Engine
 - Internet Public Library (ipl2), an online reference service (<http://www.ipl.org>)
 - Google's Government Search (<http://www.google.com/unclesam>)
 - Google's Scholar (<http://scholar.google.com>)
-
-

Step 3: Evaluate Your Information

There are certain evaluation criteria to consider as you examine the collected information.

- Authority — Who is the author? What are his or her credentials?
-
-

- Reliability — Does the information seem accurate?
-
-

- Currency — Is the information up to date?
-
-

- Completeness

- Is the information complete? _____
- Is it a summary of some other work? _____
- At what level is the information relayed? _____
- Who is the intended audience? _____

- Relevancy — Does the information gathered answer your question?

Step 4: Use and/or Do Something With the Information

Step 5: Cite Your Sources (Using APA)

Source citations provide supporting facts to your research, provide others with the ability to check your interpretation, provide credit where credit is due, and avoid the allegations of plagiarism.

Citations should contain the following information:

- Title of work
- Author(s)
- Publishing information (date, publisher, city, state)
- URL (if available and applicable)

Get this information recorded immediately. Use note cards for each source or record in a preconfigured spreadsheet or table (Citation Job Aid) with these field names as column headings. You will not have to retrace your steps to find the information. You can also use Web 2.0 tools.

This page intentionally left blank.

Homework F

Second Project Proposal

Student Name: _____

Project Title: _____

Date: _____

Element	Description	Information	
Problem/Opportunity Statement	Describe the problem or improvement opportunity.		
Consequences of Status Quo	Financial and/or non-financial cost of doing nothing. (<i>What will this problem cost us if it remains uncorrected? What revenue or benefits will be lost if the opportunity is not taken?</i>)		
Anticipated Project Expenses	In dollars, to the extent possible and appropriate.		
Benefits to Stakeholders and Other Justifications	Who are the internal and/or external stakeholders who may benefit? What can be measured that reflects how well or efficiently their needs or expectations are being met? What changes in that measure(s) are projected from this project?	For each benefit or justification, identify the following criteria: Benefit #1 Stakeholder: Need/Expectation: Measure: Projected Outcome: Benefit #2 Stakeholder: Need/Expectation: Measure: Projected Outcome:	

RESEARCH TOOLS

Other Justifications	Any other reasons why this project should be approved?	Other Justification #1 Stakeholder: Need/Expectation: Measure: Projected Change:	
Proposed Team Members	Names and titles of proposed team members. Also include organization name if external to the department.		
Projected Proposal	S M A R T	Specific	
		Measureable	
		Achievable	
		Realistic	
		Time Sensitive	
Projected Hypothesis	Hypothesis #1 Hypothesis #2		
Other Support Required	Data access, equipment, etc.		
Review Status		Submission Date: Initial Review Date: Initial Review Status: Yes No To Be Reconsidered Reconsideration Date: Final Review Status: Yes No To Be Reconsidered in Future	
Signature	To be signed by a senior management/ council representative upon determination of final review status.	X _____ Printed Name and Title: Date:	

APPENDIX B

USEFUL URLS

This page intentionally left blank.

Useful URLs

Site Name or Focus	URL
APA Style Guide	http://www.apastyle.org/elecref.html
Bookmarking Service	http://delicious.com/ http://www.netvouz.com/
Citation Generator Service	http://citationmachine.net http://www.calvin.edu/library/knightcite http://www.monroec.edu/depts/library/citing.htm (brief guides on various citing styles and more) http://library.com.edu/How_To/Tools_for_Students.html#Citation (free tools) http://software.informer.com/getfree-harvard-citation-builder/
EMSWorld	http://www.emsworld.com/ http://www.emsworld.com/interactive/
Feedage.com (RSS feeds for blogs/podcasts)	http://www.feedage.com/feeds/1942506/ems-responder-blogs-podcasts-for-emergency-medical-services-open-airways http://www.emsresponder.com/interactive/category/open-airways/feed/
Foundation for Critical Thinking	http://www.criticalthinking.org
HealthONE EMS & Trauma Services	http://www.healthoneems.com/
Homeland Security Digital Library	https://www.hsdl.gov (a restricted repository where the material is Controlled Unclassified Information, sensitive, or Unclassified/For Official Use Only)
ICMA	http://icma.org/en/icma/knowledge_network/topics/kn/Topic/80/Emergency_Medical_Services_EMS
Informational Databases ERIC Gale Group HINARI MERLOT NAP Newsbank Questia	www.eric.ed.gov/ www.gale.cengage.com/ http://www.who.int/hinari/en/ http://www.merlot.org/ http://www.nap.edu/ www.newsbank.com/ http://www.questia.com/
Journal of Emergency Medicine	http://www.aaem.org/jem/ http://connect.jems.com/group/prehospitalstemi/forum/topics/stemi-review-podcasts

RESEARCH TOOLS

Site Name or Focus	URL
Legal Search sites/engines FindLaw Global Legal Information Network Law Library of Congress	http://www.findlaw.com http://www.glin.gov/search.action/ http://www.glin.gov/search.action/
Lessons Learned Information Sharing	https://www.llis.dhs.gov/signup.do (information sharing database – requires subscription without fee)
Medical sites Healthfinder National Institutes of Health National Library of Medicine The Merck Manuals: Online Medical Library	http://healthfinder.gov http://www.nih.gov http://www.nlm.nih.gov http://www.merck.com/mmhe/index.html
NETC Learning Resource Center How to Find an EFO Paper OpenSearch Web Browser Plug-ins RSS Feeds Devoted to Fire Service & Emergency Management Communities Fire & Emergency Services Custom Search Engine Search Tips and Tutorials Podcasts Coffee Break Training	http://www.lrc.fema.gov/index.html http://www.lrc.fema.gov/downloads/efo_fd_skin.swf http://www.lrc.fema.gov/plugins.html http://www.lrc.fema.gov/rss.html http://www.lrc.fema.gov/cse.html http://www.lrc.fema.gov/help.html http://www.usfa.fema.gov/downloads/pdf/coffee-break/is/is_2009_5.pdf http://www.usfa.fema.gov/nfa/coffee-break
Online Education Degrees at a Distance Program: Courses Delmar EMS Community Site	http://www.usfa.fema.gov/nfa/higher_ed/feshe http://cengagesites.com/academic/?site=4357
PubMed (U.S. National Library of Medicine National Institutes of Health)	http://www.ncbi.nlm.nih.gov/pubmed/ (PubMed comprises more than 20 million citations for biomedical literature from MEDLINE, life science journals, and online books. Citations may include links to full-text content from PubMed Central and publisher websites.)

RESEARCH TOOLS

Site Name or Focus	URL
Really Simple Syndication Rich Site Summary	http://www.whatisrss.com/ http://www.contentious.com/2003/10/18/what-are-webfeeds-rss-and-why-should-you-care-2/ http://www.xml.com/pub/a/2002/12/18/dive-into-xml.html http://webdesign.about.com/od/rss/a/what_is_rss.htm http://www.iafc.org/displaycommon.cfm?an=1&subarticlenbr=1120
Research Tools iTools Library of Congress The National Archives WW Research Tools Web Finding Tools Web 2.0 Tools Web 2.0 Tools & Applications	http://www.itools.com/research http://www.loc.gov/rr/tools.html http://www.archives.gov/research/tools http://www.virtualsalt.com/search.htm http://www.virtualsalt.com/search.htm http://www.nps.edu/library/Research/SubjectGuides/Research Tools/Web Finding Tools/WebFindingToolsEssay.html# http://oedb.org/library/beginning-online-learning/e-learning-reloaded:-top-50-web-2.0-tools-for-info-junkies,-researchers-&-students http://www.go2web20.net/
Search Engines – Additional Oingo – meaning-based search Clusty – clustering search engine Raging Search	http://www.squirrelnet.com/search/Oingo.asp http://clusty.com/ http://ragingsearch.altavista.com use ‘NOT sponsored’ after search item(s) to eliminate the sponsored matches use URL:.gov (URL colon period gov) to restrict to government sites
Search Engines – Top Choices	http://searchenginewatch.com/2156221#top
Subject Bibliographies	http://www.lrc.fema.gov/biblio.xml http://www.lrc.fema.gov/biblio.html http://www.internettutorials.net/subject.html#academic
Subject-specific Research Guides Legal research MedlinePlus TRIP Database	http://www.virtualchase.com/(Teaching Legal Professionals How to Do Research) http://www.medlineplus.gov (a service of the U.S. National Library of Medicine & the National Institutes of Health) http://www.tripdatabase.com/index.html (evidence-based medicine; real-time data)
The Researching Librarian	http://www.researchinglibrarian.com/

RESEARCH TOOLS

Site Name or Focus	URL
U.S. Government Manual: Main Page	http://www.gpoaccess.gov/gmanual/
U.S. Government's Official Web Portal	http://www.usa.gov/
Updated Links to Fire Service & Emergency Management Communities	http://www.lrc.fema.gov/index.html
USFA's Fire & Emergency Services Higher Education Model curriculum	http://www.usfa.dhs.gov/nfa/higher_ed
Web 2.0 Tools & Applications	http://www.go2web20.net
Web Center for Social Research Methods	http://www.socialresearchmethods.net/

APPENDIX C

SEARCH ENGINES AND ONLINE INFORMATIONAL DATABASES

This page intentionally left blank.

Search Engines and Online Informational Databases

Crawler-based search engines have three parts: the spider or crawler, the index, and the search engine software. The spider visits a Web page, reads it, and follows links to other pages and repeats these activities. Everything the spider uncovers on the Web pages is recorded in the index or catalog. The spider may periodically revisit the initial Web page and any changes are updated in the index. Only indexed pages are viewable by the searching public. It is the search engine software that filters the accumulated indexed pages (there are millions) for matches in the defined search and ranks them according to what it believes is relevant. Google, Yahoo, Windows Live Search and AOL Search are examples of crawler-based search engines.

Directory search engines depend on humans for their listings. Sometimes this type of search engine is referred to as a subject directory. It is a service offering a collection of links to Internet resources submitted by site creators or evaluators and organized into subject categories, which are arranged from general to more specific topics. Someone, either the owner or a reviewer, submits a short description of the website. This description provides the information that the search uses for its matches. Changes to the site are only updated by a new descriptive submission. Directory search engines are most useful when doing topic-based research. Yahoo Directory, Open Directory, AltaVista, Ask.com, INFOMINE, and BUBL LINK are examples of directory search engines.

Of course there are exceptions to these definitions. There are hybrid search engines and metasearch engines. In hybrid search engines, both types of results may be presented to you. MSN Search is a hybrid search engine. Metasearch engines send their search to other search engines at the same time and then merge the results together. Dogpile is such a search engine.

Beware of the Advertising Elements

Beware of the advertising elements on result pages. Two such Internet attributes are Pay-Per-Click and Paid Inclusions.

There are some aspects that appear on search engines' result pages that are really advertising elements. Two such Internet attributes are PPC and Paid Inclusions. PPC enables advertisers to list their site at the top of search engine results through advertising on keywords that best describe their product or service. It's a dynamic marketplace — the higher the bid, the higher the advertisement will be displayed in the list. The advertiser only pays when a searcher clicks on his listing and connects to that site. Advertisers do not pay to list; they only pay for visitations. Thus advertisers only pay for the traffic to their site. (PPC is also known as Pay Per Ranking, Pay Per Placement, Pay Per Position, or Cost Per Click.)

Paid Inclusion programs pay search engines to list pages from their website, which are re-spidered weekly. The page ranking is determined by the search engine's underlying relevancy algorithms. However, there are search engine optimizers that can improve the volume and quality of traffic by editing the website's content and Hypertext Markup Language coding to increase relevance sought via keywords and remove barriers found in the indexing activity.

Look for Primary Sources' Sites

No matter which search engine used, you are looking for primary sources' sites to gather your materials. Primary sources are the journals and books where academics and scientists publish the results of their experiments and studies. These are sites that specialize in first quality information, such as INFOMINE, which provides a search of scholarly literature across many disciplines and sources, including theses, books, abstracts and articles. Seek government websites and those managed by organizations. Secondary sources are popular magazines, websites, books and newspapers.

Subject directories are either academic/professional directories or commercial portals. Academic directories tend to be associated with libraries or academic institutions and are created to enhance the research process and provide high quality sites of interest. Subject directories usually identify creators or authors; provide a list of keywords; give directions on how to access; and identify audience levels. INFOMINE and BUBL LINK are examples of academic directories.

The selection criteria for subject directories differ substantially. Academic directories vet their entries while anyone can submit a site to commercial portals without any verification of the content. Pick your search directories carefully.

Keywords and Phrases Are Useful for Both Types of Search Engines

Keywords or phrases related to your topic of interest will help to focus the search. Each search engine has its own set of keywords that produces results. Knowing what the keywords are is not always apparent. Some sites list them (informational database), but many keywords are unknown. Searchers use their own vocabulary as keywords. This is the normal procedure, but searchers can enhance their searches by using synonyms of their keywords as well.

To make your search the most productive, select the advanced search located near the standard query box (actual location is determined by the search engine used).

There are additional searching tips available. Perhaps as your team works on your project, your teammates will share some of their techniques. You are also encouraged to access some of the tips offered by the search engine you favor.

Don't overlook the EFO research papers housed on the LRC site. These research papers represent NFA class assignments written by academy performers who have received a grade of 3.0 or better. Most EFO papers written after 1998 are available online.

Online Informational Databases

Another source of online information is informational databases. Some are free to all, some are free through an association like a school or university, and some are fee-based. The advantage of using searchable databases is that professionals have reviewed and indexed items whose content have merit. Following is a short list of informational databases:

- Gale Group — full-text articles from journals focusing on nursing, social sciences, and psychology
- Newsbank — news articles with a focus on social, economic, government, environmental, sports, health and science
- ERIC — sponsored by the U.S. Department of Education and contains abstracts of articles, papers, research reports, books, conferences, curriculum, and teaching guides related to education
- National Academies Press — established to publish reports issued by the National Academy of Sciences, the National Academy of Engineering, the Institute of Medicine, and the National Research Council
- Questia — full text of books, journal articles, magazine articles, and newspaper articles where searching is free but access to sources is fee-based
- MERLOT — free collection of online learning materials, assignments, and reviews to enhance teaching and learning experiences (be wary as resources have not been peer-reviewed)
- WHO's HINARI — contains over 3,750 journals

Each database indexes different articles and journals; thus, search your topic through as many different databases as you can.

Database Structure

Databases are hierarchical in nature. There are two basic types of databases: flat and relational. Most of those encountered on the Web are relational databases. The two main structures of a database are tables and indices. Tables store the data in fields — columns of the table. Each field has a type associated with it, such as text, numeric and other. Without going into too much detail, generally text fields contain strings of characters; numeric fields contain numbers; and other fields house media and pictures. The rows in the table represent individual data records.

The indices do not store data. They are used internally by the database engine to speed up search options in its associated table. The index may define the order of the data — ascending/descending — or unique qualities, such as prohibiting duplicate data being inserted in different records, such as Social Security numbers.

This structure provides the organization of massive quantities of data and the rapid access of specific data points. Your ability to take advantage of the information housed in a database revolves around your skill to search the database fields.

We use databases to search for information on a specific topic of interest. Choosing the appropriate language to perform this search involves knowing the language of the database. Most people start their searches by conducting a “natural language search” or keyword search. This natural language search does not limit the search to one specific field but looks at numerous fields.

The other language is referred to as a “controlled vocabulary.” The phone book is an example of a database that uses a controlled vocabulary. If you don’t use their language, you may not find what you are looking for. Suppose you looked for “civil engineers” instead of “engineers — civil.” Would you find what you were looking for? Would the phone book give you the hint, see “engineers — civil”?

For database searches, the natural language search gets you started, but the controlled vocabulary allows a more complete search. Common database controlled vocabulary terms include subject headings, subject terms, descriptors, or indexing terms. Other controlled vocabulary terms may be provided by the database you are using in its thesaurus or index. Controlled vocabulary serves to index the content of books, journal articles, and other items in predictable ways.

APPENDIX D

BRINGING ORDER TO CHAOS

This page intentionally left blank.

Bringing Order to Chaos

National Incident Management Teams of the wildland fire service have gained a reputation for bringing order to chaos when disaster strikes. Whether organizing search teams for remnants of the Columbia shuttle or providing command and control for recovery teams at Ground Zero of the Twin Towers, these IMTs have set a powerful example of leadership in uncertain situations.

Early in the morning on Sept. 1, 2005, the Southern Area IMT, called upon to provide assistance in the aftermath of Hurricane Katrina, arrived at the Louis Armstrong New Orleans International Airport, stepping into a surreal, grim and profoundly chaotic world. Hundreds of patients were scattered about the main terminal and ticketing area, over 300 of them confined to stretchers. Most were elderly and infirm, but many were injured during the hurricane. At the same time, the evacuation of displaced residents had begun. Evacuees arrived by bus and helicopter, many apparently from nursing homes. In the days ahead, the airport was the portal for more than 10,000 evacuees, who were transported from the airport on approximately 60 flights in commercial jets or military medical C-130s and C-17s.

A host of emergency responders — Disaster Medical Assistance Teams, Federal Protective Service, Nevada National Guard, FEMA representatives, Jefferson Parish Police, Transportation Security Agency, Air Force Medical and Evacuation forces, Airport Authority, and a few members of New Orleans Fire Department — had converged on the scene. Each team had its own mission, and the teams were not talking with each other. At 1900 on the day they arrived, the IMT conducted their first planning meeting with representatives from many of the teams. The goals of the meeting were to organize operations, set up a communications system, and identify needs for supplies. During the meeting, each representative was asked to provide three pieces of information — team name, team leader, and one item they needed. “Coffee” was the item in need listed by one team leader. The light-hearted chuckles through the crowd indicated that everyone could use a little caffeine. “No. You don’t understand. I’m talking about pounds and pounds of coffee,” he said. “Every time we open the door of the temporary morgue, the stench is so bad that we need to pour a pound of coffee inside.”

This page intentionally left blank.

UNIT 3: LITERATURE REVIEW AND EVALUATION

TERMINAL OBJECTIVE

The students will be able to:

- 3.1 *Evaluate and analyze collected information as they attempt to formulate the answers to their problem, question or issue.*

ENABLING OBJECTIVES

The students will be able to:

- 3.1 *Differentiate which quantitative and qualitative techniques are common analytical methodologies.*
 - 3.2 *Assess selected statistical data against research goal.*
 - 3.3 *Compare selected statistical data against research goal.*
 - 3.4 *Determine the difference between data and information.*
 - 3.5 *Define the basic tasks used in performing an analysis.*
 - 3.6 *Critique selected information and data for validity.*
 - 3.7 *Identify the impact and implications.*
 - 3.8 *Evaluate findings for research study.*
 - 3.9 *Develop technically based strategic solutions.*
-

This page intentionally left blank.



UNIT 3: LITERATURE REVIEW AND EVALUATION

Slide 3-1

ENABLING OBJECTIVES

- Differentiate which quantitative and qualitative techniques are common analytical methodologies.
- Assess selected statistical data against research goal.
- Compare selected statistical data against research goal.

Slide 3-2

ENABLING OBJECTIVES (cont'd)

- Determine the difference between data and information.
- Define the basic tasks used in performing an analysis.
- Critique selected information and data for validity.

Slide 3-3

ENABLING OBJECTIVES (cont'd)

- Identify the impact and implications.
- Evaluate findings for research study.
- Develop technically based strategic solutions.

Slide 3-4

I. LITERATURE REVIEW

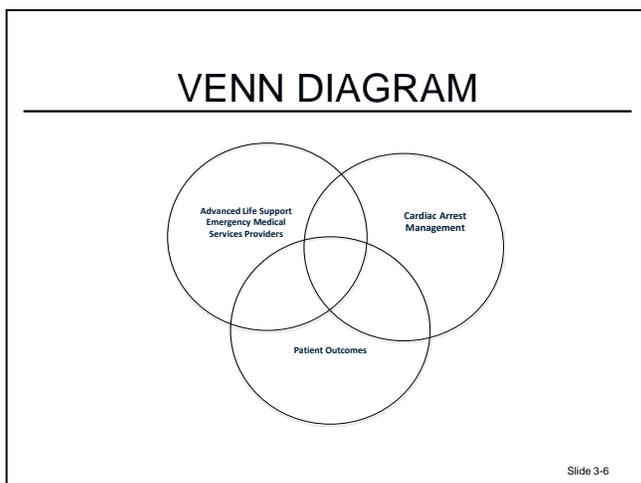
LITERATURE REVIEW

- Existing knowledge.
- Research purpose.
- Literature search.
- How old is too old?

Slide 3-5

- A. Existing knowledge is important to our understanding.
- B. Purpose of research.
 - 1. Build upon existing knowledge base on a specific topic.
 - 2. Attempt to “fill in” the gaps in the knowledge base.
 - 3. Most use theory as a guide for proper context.
- C. Searching through the literature.
 - 1. Identify the specific concept or construct being examined by the problem statement.

2. Use a “wide” to “narrow” approach (e.g., “worldly” to “national” to “local” to “agency”).
 3. Start reviewing articles published within the past five years.
 4. Gradually work back in time.
 - a. Concept/Construct may become difficult to adhere to.
 - b. Process eventually reaches back to a point where these weren’t yet identified.
 5. Seminal or foundational works.
 - a. Considered original work where an idea/concept/construct was started.
 - b. Forms the basis for all future research on the topic.
 - c. Helps put into context how much has been learned or is still unanswered.
- D. How old is too old? Depends on several key factors.
1. Relevance to current practices or objectives.
 2. Applicability to current practices or objectives.
 3. Seminal or foundational work.
 4. Amount of existing literature on topic.



This page intentionally left blank.

ACTIVITY 3.1

Evaluating an Abstract

Purpose

To sort through available research to quickly identify articles pertinent to topic area that are valid and credible which will form the foundation of the current research project.

Directions

1. Each table will be assigned two abstracts to read.
2. Table members are to read the article with the four elements in mind.
3. Evaluate the following:
 - a. Identify the purpose of the article.
 - b. Identify the method or approach used to conduct the research.
 - c. Identify the overall findings/results.
 - d. Identify the implications/conclusions.
4. Evaluate the strength of the abstract in supporting your table's assigned proposal topic area.
5. Be prepared to report on the above evaluation findings.

This page intentionally left blank.

This page intentionally left blank.

FOCUS ON THE EMS WORKFORCE

COMPARISON OF PUBLIC SAFETY PROVIDER INJURY RATES

Joe Suyarna, MD, Jon C. Rittenberger, MD, MS, P. Daniel Patterson, PhD,
David Hostler, PhD, CSCS

ABSTRACT

Introduction. During normal operations, public safety personnel may become injured, leading them to seek medical care and possible time off. Examining the nature and patterns of injury may help to identify preventive health measures for all public safety personnel and address specific needs of each discipline based on actual risk.

Objective. To determine the types and severity of injuries encountered by public safety personnel during routine work conditions within a single urban population.

Methods. De-identified workers' compensation data for emergency medical services (EMS), fire, and police providers from one urban center between January 1, 2005, and May 31, 2007, were examined. Data included type of injury, severity of injury, and date of event. Severity was categorized as follows: *lost time* (type 1), *medical evaluation* (type 2), *report only* (type 3), *restricted duty* (type 4), and *not reported* (type 5). Analysis of variance (ANOVA) and a pairwise t-test between groups with a Bonferroni correction was performed to determine the relative risk of injuries between groups. **Results.** During the 29-month interval, an average workforce of 850 firefighters, 194 EMS providers, and 850 police officers were employed. A total of 1,295 workers' compensation events were documented, with 243 (18%) reported from EMS, 477 (36%) from fire, and 608 (46%) from police. Type 1 injuries were more common in fire (39%) and police (38%) than EMS (23%). EMS had higher rates of lost work (type 1) and medical evaluations (type

2) than both fire and police. Workers' compensation events common to all bureaus were minor trauma (76%) and exposures to blood-borne pathogens (12%). Minor traumatic injuries, mostly associated with axial musculoskeletal

Received February 21, 2009, from the Department of Emergency Medicine, Emergency Responder Human Performance Laboratory, University of Pittsburgh QS, JCR, POP, DH), Pittsburgh, Pennsylvania-Revision received March 26, 2009; accepted for publication April 7, 2009.

Address correspondence and reprint requests to: Joe Suyama, MD, FACEP, Assistant Professor, Department of Emergency Medicine, University of Pittsburgh School of Medicine, Medical Director, Emergency Responder Human Performance Laboratory, 3600 Forbes Avenue, Suite 400A, Pittsburgh, PA 15261. e-mail: suyamaj@upmc.edu

doi: 10.1080/10903120903144908

strains and extremity injuries, were responsible for the majority of injuries resulting in missed work. Injuries more common in a specific bureau included motor vehicle crashes and gunshot wounds (police) and cardiovascular disease, burns, and heat illness (fire). **Conclusion.** Public safety personnel are affected by both profession-specific and non-profession-specific injuries. Overall, EMS has higher rates of missed time and medical evaluations than both fire and police. These data highlight the need to make direct comparisons of various public safety personnel bureaus using a common time interval and locale in order to rationally plan interventions and apply resources. **Key words:** injury; firefighter; police; EMS; emergency medical services; public safety; workforce

**ONDANSETRON IS SAFE AND EFFECTIVE FOR
PREHOSPITAL TREATMENT OF NAUSEA AND VOMITING BY
PARAMEDICS**

Angelo A. Salvucci, MD, Benjamin Squire, MD, MPH, Marc Burdick, BS, MICP,
Mark Luoto, MD, David Brazzel, MD, Reza Vaezazizi, MD

ABSTRACT

Objective. The objectives were to evaluate the safety and efficacy of ondansetron in the out-of-hospital treatment of undifferentiated nausea or vomiting. **Methods.** Patients with severe nausea or intractable vomiting who were transported by paramedic-staffed ambulances in eight California counties were treated with intravenous (IV), intramuscular (IM), or oral dissolving tablet (ODT) administration of ondansetron. Data were collected prospectively for a six-month period using an online database. Prospectively defined outcome measures were 1) efficacy as measured by a quantitative visual analog nausea scale and 2) incidence of adverse effects. There were no control or placebo groups. **Results.** Data was collected for 2072 patients, but one patient did not receive the medication. Therefore, Ondansetron was administered to 2,071 patients (3.7% of transported patients). Most patients were adult, with only 66 patients less than 18 years old. Of the 2,071 patients, 1,320 (64%) received IV administration, 77 (4%) received IM administration, and 674 (33%) received ODT administration of ondansetron. Intravenous administration resulted in the largest improvements in nausea scores (mean 4.4; 95% confidence interval [CI] 4.2, 4.5), followed by IM (mean 3.6; 95% CI 3.0, 4.3) and ODT (mean 3.3; 95% CI 3.1, 3.5). Overall, the mean decrease in nausea score was 4.0 (95% CI 3.9, 4.1; $p < 0.001$) on a 10-point scale. After medication administration, four patients had mild hypotension, one had hypertension, two had itching or rash, and one had a brief episode of supraventricular tachycardia that resolved spontaneously.

Conclusions. Ondansetron is safe and effective for out-of-hospital treatment of nausea and vomiting when administered by paramedics via the IV, IM, or oral route. When available to paramedics, ondansetron is used frequently. **Key words:** antiemetic; paramedic; ondansetron; nausea; vomiting

Received June 14, 2010, from Santa Barbara County EMS (AAS, MB), Santa Barbara, California; the Department of Emergency Medicine (BS), Harbor—UCLA Medical Center, Torrance, California; Costal Valleys EMS (ML), Santa Rosa, California; El Dorado County EMS (DB), Placerville, California; and Inland Counties Emergency Medical Agency (RV), San Bernardino, California. Revision received July 2, 2010; accepted for publication July 27, 2010

Presented on October 28, 2010 at the ACEP Scientific Assembly, Las Vegas, NV.

The authors report no conflicts of interest.

Address correspondence and reprint requests to: Dr. Benjamin Squire, Harbor—UCLA Medical Center, Emergency Medicine, 1000 West Carson Street, Box 21, Torrance, CA 90509. e-mail: benjamin-squire@gmail.com

doi is 10.3109/10903127.2010.519822

PREHOSPITAL EMERGENCY CARE 201

1;1 5:34-38

INTRODUCTION

COMPARISON OF BOOGIE-ASSISTED INTUBATION WITH TRADITIONAL ENDOTRACHEAL INTUBATION IN A SIMULATED DIFFICULT AIRWAY

Matthew J. Messa, DO, Douglas F. Kupas, MD, Douglas L. Dunham, DO

ABSTRACT

Objective. To compare the success and ease of bougie-assisted intubation (BAI) with those of traditional endotracheal intubation (ETI) in a simulated difficult airway (20.4 seconds for BAI vs. 16.7 seconds for ETI, $p = 0.102$). **Methods.** This was a prospective, randomized, crossover, single-blind study comparing BAI with ETI in a simulated difficult airway. The 35 participants included paramedics, flight nurses, and emergency medicine resident physicians. Participants were already experienced in ETI and received a brief demonstration of BAI. A simulated difficult airway was created using a Laerdal adult intubation manikin. Cervical motion was mechanically limited to provide a grade III Cormack and Lehane glottic view. Participants performed ETI and BAI in randomized order. Successful placement in the trachea and time to successful placement were recorded for both techniques by each participant. After intubating the manikin with both techniques, each participant was asked to complete a Likert-style survey assessing ease of each technique. **Results.** Of the 35 participants, 27 were successful with both techniques and two failed with both techniques. The remaining six participants all failed at ETI but were able to intubate using BAI. There was significantly greater success in intubating the simulated difficult airway with BAI than with ETI (94% vs. 77%, $p = 0.0313$). The order of techniques attempted did not influence this conclusion. There was no difference in average time to successful intubation (20.4 seconds for BAI vs. 16.7 seconds for ETI, $p = 0.102$). Thirty-two (91.4%) of the participants completed the survey regarding ease of performing each technique. Forty-one percent rated the ease of intubation as the same for the two methods, 50% rated BAI as easier, and 9% rated ETI as easier ($p = 0.0006$). **Conclusion.** In a

simulated difficult airway, BAI has a higher success

Received May 24, 2010, from the Department of Emergency Medicine Geisinger Health System, Danville, Pennsylvania. Revision received July 1, 2010; accepted for publication July 14, 2010.

Presented at the Society for Academic Emergency Medicine annual meeting, New Orleans, Louisiana, May 2009.

The authors sincerely thank G. Craig Wood, MS, their statistician, for his statistical analysis, and Michael J. Leicht, MD, for his thoughtful review of the manuscript.

The authors report no conflicts of interest.

Reprints are not available.

Address correspondence to Douglas F. Kupas, MD, Department of Emergency Medicine, Geisinger Health System, 100 North Academy Avenue, Danville, PA 17822-2005. [e-mail: dkupas@geisinger.edu](mailto:dkupas@geisinger.edu)

doi: 10.3109/10903127.2010.519821

rate than traditional ETI without increasing the time to successful intubation. Intubators perceive BAI as being easier to perform than traditional ETI in this simulated difficult airway scenario. **Key words:** endotracheal intubation; bougie; intubation; emergency medical services; prehospital; airway management

PREHOSPITAL EMERGENCY CARE

2011;15:30-33

INTRODUCTION

Traditional endotracheal intubation (ETI) using direct laryngoscopy is a psychomotor

Focus ON FIREFIGHTER PHYSIOLOGY

PHYSIOLOGICAL RECOVERY FROM FIREFIGHTING ACTIVITIES IN REHABILITATION AND BEYOND

Gavin P. Horn, PhD, Steve Gutzmer, BS, Christopher A. Fahs, MS, Steve J. Petruzzello, PhD, Eric Goldstein, BS, George C. Fahey, PhD, Bo Fernhall, PhD, Denise L. Smith, PhD

ABSTRACT

Objectives. The primary objective of this study was to document the timeline of physiologic recovery from firefighting activities in order to inform emergency medical services (EMS) of vital sign values that might be expected during incident rehabilitation and in developing rehabilitation protocols to make decisions about when to return personnel to the fireground. **Secondarily,** we compared two different incident rehabilitation strategies to determine effectiveness in reducing physiologic strain following firefighting. **Methods.** A repeated-measures randomized crossover design was utilized in which firefighters conducted a controlled set of firefighting activities, after which they completed incident rehabilitation in one of two conditions: 1) similar to currently used rehabilitation protocols and 2) with active cooling and nutritional intervention. Following 15 minutes of rehabilitation, each firefighter was asked to perform a simulated rescue "dummy drag" and then recover for 120 minutes in a quiet area. Core temperature and heart rate were recorded throughout the study. Blood pressures and subendocardial viability ratios were obtained before firefighting, after firefighting, and at standardized times during rehabilitation and

Received April 20, 2010, from the University of Illinois (GPH, SG, CAF, SJP, EG, GCF, BF, DLS), Champaign, Illinois; the University of Oklahoma (CAF), Norman, Oklahoma; Georgetown University (EG), Washington, DC; and Skidmore College (DLS), Saratoga Springs, New York.

Revision received September 25, 2010; accepted for publication September 27, 2010.

Supported by the National Institute for Occupational Safety and Health (1R03 OH009111-01).

The authors thank the volunteers in this study for their participation and also acknowledge Sue Blevins for her assistance with data entry and test preparations.

The authors report no conflicts of interest in this study.

Address correspondence and reprint requests to: Gavin Horn, PhD, University of Illinois Fire Service Institute, 11 Gerty Drive, Champaign, IL 61820. e-mail: ghorn@fsi.illinois.edu
doi: 10.3109/10903127.2010.545474

recovery. Results. Heart rate and core temperature increased during firefighting, and core temperature continued to increase for 7 minutes after completion of firefighting activities. These values did not return to baseline until at least 50 minutes after firefighting activity. Systolic blood pressures were significantly reduced during rehabilitation (15.2%), and recovered 7.7% during the first 50 minutes of recovery, but remained significantly lower than before firefighting for at least 120 minutes. An index of subendocardial perfusion was also significantly depressed for up to 110 minutes after firefighting. Differences between rehabilitation protocols were minimal. **Conclusions.** The timeline for recovery from firefighting activities is significantly longer than the typical 10-20-minute rehabilitation period that often is provided on the fireground. Modifications from the current rehabilitation protocol do not appear to improve the recovery timeline when rehabilitation is conducted in a cool room. While firefighters often are concerned about elevated blood pressures, this study suggests that firefighters and EMS personnel should also be cognizant of the potential dangers of hypotension. **Key words:** rehabilitation; blood pressure; body temperature; heart rate; firefighter.

**UTILIZATION OF EMERGENCY MEDICAL SERVICES IN A LARGE URBAN AREA:
DESCRIPTION OF CALL TYPES AND TEMPORAL TRENDS**

Kevin G. Munjal, MD, Robert A. Silverman, MD, MS, John Freese, MD, James D. Braun, MA,
Bradley J. Kaufman, MD, MPH, Douglas Isaacs, MD, Andrew Werner, EMT-P,
Mayris Webber, DrPH, MPH, Charles B. Hall, PhD, David J. Prezant, MD

ABSTRACT

Background. Emergency medical services (EMS) systems are used by the public for a range of medically related problems. Objective. To understand and analyze the patterns of EMS utilization and trends over time in a large urban EMS system so that we may better direct efforts toward improving those services. Methods. The 63 call type designations from all New York City (NYC) 9-1-1 EMS calls between 1999 and 2007 were obtained and grouped into 10 broad and 30 specific medical categories. Aggregated numbers of total EMS calls and individual categories were divided by NYC resident population estimates to determine utilization rates. Temporal trends were evaluated for statistical significance with Spearman's rho (ρ). Results. There were 9,916,904 EMS calls between 1999 and 2007, with an average of 1,101,878 calls/year. Utilization rates increased from 129.5 to 141.9 calls/1,000 residents/year over the study period (average annual rise of 1.16%). Among all medical/surgical call types (excluding trauma), there was an average annual increase of 1.8%/year. The most substantial increases were among "psychiatric/drug related" (+5.6%/year), "generalized illness" (+3.2%/year), and "environmental related" calls (+2.9%/year). The largest decrease was among "respiratory" calls (-1.2%/year), specifically for "asthma" (-5.0%/year). For trauma call types, there was an annual average decrease of 0.4%/year, with the cate-

Received June 15, 2009, from the Office of Medical Affairs (KGM, JF, JDB, BJK, DI, AW, DJP), The New York City Fire Department, Brooklyn, New York; the Department of Emergency Medicine (KGM), Montefiore Medical Center, Bronx, New York; the Department of Emergency Medicine (RAS, BJK, DI), Long Island Jewish Medical Center, New Hyde Park, New York; the Division of Biostatistics, Department of Epidemiology and Population Health (CBH), Albert Einstein College of Medicine, Bronx, New York; and the Pulmonary Division, Department of Medicine (DJP), Albert Einstein College of Medicine, Bronx, New York. Revision received December 16, 2010; accepted for publication December 21, 2010.

Presented as an abstract at the National Association of EMS Physicians annual meeting, Phoenix, Arizona, January 2010.

Our thanks to the men and women of the New York City Fire Department for their service to the people and to the city of New York.

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

Address correspondence and reprint requests to: Kevin G. Munjal, MD, Office of Medical Affairs, the New York City Fire Department, 9 Metrotech, 4-N-4, Brooklyn, NY 11201.

doi: 10.3109/10903127.2011.561403

gory of "violence related" calls having the

**CAN EMERGENCY MEDICAL SERVICES PERSONNEL EFFECTIVELY PLACE
AND USE THE SUPRAGLOTTIC AIRWAY LARYNGOPHARYNGEAL TUBE (SALT)
AIRWAY?**

Bryan E. Bledsoe, DO, David E. Slattery, MD, Russell Lauver, DO, Wesley Forred, RN, Larry Johnson, NREMT-P, Gino Rigo, BS

ABSTRACT

Background. Various alternative airway devices have been developed in the last several years. Among these is the Supraglottic Airway Laryngopharyngeal Tube (SALT), which was designed to function as a basic mechanical airway and as an endotracheal tube (ET) introducer for blind endotracheal intubation (ETI). **Objective.** To determine the rate of successful placement of the SALT and the success rate of subsequent blind ET insertion by a cohort of emergency medical services (EMS) providers of varying levels of EMS certification. **Methods.** This study was a two-phase, two-group nonblinded, prospective time trial using a convenience cohort of prehospital providers to determine the success rate for SALT placement (i.e., the basic life support [BLS] phase) and ET placement using the SALT (i.e., the advanced life support [ALS] phase) in an unembalmed human cadaver model. The part 1 cohort (group 1) comprised predominantly basic and intermediate emergency medical technician (EMT)-level providers, whereas the part 2 cohort (group 2) comprised exclusively paramedic-level providers. **Results.** In group 1, 51 (98%) of the subjects were able to successfully place the SALT and ventilate the cadaver (BLS phase), with 48 (92.3%) subjects successfully placing it on the first attempt. In group 2, 21 (96%) of the subjects were able to successfully place the SALT, with 19 (86%) placing the SALT on the first attempt. Successful blind placement of an ET through the SALT (ALS phase) by group 1 was 48.1% (95% confidence interval ICU 34-62), with 37% (95% CI: 24-51) placing the ET on the

first attempt. In group 2, 20 subjects (91% [95% CI: 71-99]) were able to successfully place an ET through the SALT, with 13 (59% [95% CI: 36-79]) doing so on the first at-

Received September 20, 2010, from the Department of Emergency Medicine, University of Nevada School of Medicine (BEB, DES, RL), Las Vegas, Nevada; University Medical Center of Southern Nevada (WF), Las Vegas Nevada; MedicWest Ambulance (LJ), Las Vegas, Nevada; and the University of Nevada at Las Vegas (GR), Las Vegas, Nevada. Revision received December 30, 2010; accepted for publication January 15, 2011.

Supported by Microtek Medical—a wholly owned subsidiary of Ecolab. Funding was limited to laboratory costs.

The authors report no conflicts of interest. The authors alone are responsible for the content and writing of the paper.

Address correspondence and reprint requests to: Bryan E Bledsoe, DO, University of Nevada School of Medicine, Emergency Medicine, 901 Rancho Lane, Suite 135, Las Vegas, NV 89106. e-mail: bbledsoe@Dme.com
doi: 10.3109/10903127.2011.561410

tempt. **Conclusions.** Emergency medical services providers of varying levels can successfully and rapidly place the SALT and ventilate a cadaver specimen. The success rate for blind placement of an ET through the SALT was suboptimal. **Key words:** airway; extraglottic airway; emergency medical services; paramedic; EMT-PREHOSMAL
EMERGENCY CARE 2011;1:1 5:3 5 9-3 65

End-Tidal CO₂ as a Predictor of Survival in Out-of-Hospital Cardiac Arrest

Marc Eckstein, MD, MPH;^{1,2} Lorien Hatch, MA;¹ Jennifer Malleck, MS;¹ Christian McClung, MD;¹ Sean O. Henderson, MD^{1,3}

Abstract

Objective: The objective of this study was to evaluate initial end-tidal CO₂ (EtCO₂) as a predictor of survival in out-of-hospital cardiac arrest.

Methods: This was a retrospective study of all adult, non-traumatic, out-of-hospital, cardiac arrests during 2006 and 2007 in Los Angeles, California. The primary outcome variable was attaining return of spontaneous circulation (ROSC) in the field. All demographic information was reviewed and logistic regression analysis was performed to determine which variables of the cardiac arrest were significantly associated with ROSC.

Results: There were 3,121 cardiac arrests included, in the study, of which 1,689 (54.4%) were witnessed, and 516 (16.9%) were primary ventricular fibrillation (VF). The mean initial EtCO₂ was 18.7 (95%CI = 18.2-19.3) for all patients. Return of spontaneous circulation was achieved in 695 patients (22.4%) for which the mean initial EtCO₂ was 27.6 (95%CI = 26.3-29.0). For patients who failed to achieve ROSC, the mean EtCO₂ was 16.0 (95%CI = 15.5-16.5). The following variables were significantly associated with achieving ROSC: witnessed arrest (OR = 1.51; 95%CI = 1.07-2.12); initial EtCO₂ >10 (OR = 4.79; 95%CI = 3.10-4.42); and EtCO₂ dropping <25% during the resuscitation (OR = 2.82; 95%CI = 2.01-3.97).

The combination of male gender, lack of bystander cardiopulmonary resuscitation, unwitnessed collapse, non-vfib arrest, initial EtCO₂ 5.10 and EtCO₂ falling > 25% was 97% predictive of failure to achieve ROSC.

Conclusions: An initial EtCO₂ >10 and the absence of a falling EtCO₂ >25% from baseline were significantly associated with achieving ROSC in out-of-hospital cardiac arrest. These additional variables should be incorporated in termination of resuscitation algorithms in the prehospital setting.

Eckstein M, Hatch L, Malleck J, McClung C, Henderson SO: End-Tidal CO₂ as a Predictor of Survival in Out-of-Hospital Cardiac Arrest. *Prehosp Disaster Med* 2011;26(3):148-150.

- 1, Department of Emergency Medicine, Keck School of Medicine of the University of Southern California, Los Angeles, California
- 2, Los Angeles Fire Department, Los Angeles, California USA
- 3, Department of Preventive Medicine, Keck School of Medicine of the University of Southern California, Los Angeles, California USA

Correspondence:

Marc Eckstein, MD, MPH
 Department of Emergency Medicine
 LAC/USC Medical Center
 1200 N. State Street, Room 1011
 Los Angeles, CA 90033
 Tel: 213-978-3741
[E-mail: eckstein@usc.edu](mailto:eckstein@usc.edu)

Keywords: end-tidal CO₂; cardiac arrest; prehospital; resuscitation

Abbreviations:

ACLS = advanced cardiac life support
 AED = automatic external defibrillator
 CPR = cardiopulmonary resuscitation
 EMS = emergency medical services
 ROSC = return of spontaneous circulation
 VF - ventricular fibrillation

Online publication: 2 September 2011

[doi:10.1017/S1049023X11006376](https://doi.org/10.1017/S1049023X11006376)

Evaluation of Success Rate and Access Time for an Adult Sternal Intraosseous Device Deployed in the Prehospital Setting

Donald V. Byars, MD; Sara N. Tsuchitani, MD; Eleanor Erwin, MD; Bradley Anglemeyer, MD; Jacob Eastman, MD

Department of Emergency Medicine,
Eastern Virginia Medical School, Norfolk,
Virginia USA

Correspondence:

Dr. Donald V. Byars
600 Gresham Drive
Raleigh Building, Suite 304
Norfolk, VA 23510 USA
Email: don.byars@gmail.com

Keywords: emergency medical service
personnel; intraosseous infusion; prehospital
care; resuscitation; sternum; vascular access

Abbreviations:

IO = intraosseous
IV = intravenous

Received: 24 February 2010

Accepted: 17 June 2010

Online publication: 3 May 2011

doi:10.1017/S1049023X11000057

Abstract

Introduction: Access to the vascular system of the critically ill or injured adult patient is essential for resuscitation. Whether due to trauma or disease, vascular collapse may delay or preclude even experienced medical providers from obtaining standard intravenous (IV) access. Access to the highly vascular intramedullary space of long bones provides a direct link to central circulation. The sternum is a thin bone easily identified by external landmarks that contains well-vascularized marrow. The intraosseous (IO) route rapidly and reliably delivers fluids, blood products, and medications. Resuscitation fluids administered by IV or IO achieve similar transit times to central circulation. The FAST-1 Intraosseous Infusion System is the first FDA-approved mechanical sternal IO device. The objectives of this study were to: (1) determine the success rate of FAST-1 sternal IO device deployment in the prehospital setting; (2) compare the time of successful sternal IO device placement to published data regarding time to IV access; and (3) describe immediate complications of sternal IO use.

Methods: All paramedics in the City of Portsmouth, Virginia were trained to correctly deploy the FAST-1 sternal IO device during a mandatory education session with the study investigators. The study subjects were critically ill or injured adult patients in cardiac arrest treated by paramedics during a one-year period. When a patient was identified as meeting study criteria, the paramedic initiated standard protocols; the FAST-1 sternal IO was substituted for the peripheral IV to establish vascular access. Time to deployment was measured and successful

placement was defined as insertion of the needle, with subsequent aspiration and fluid flow without infiltration.

Results: Over the one-year period, paramedics attempted 41 FAST-1 insertions in the pre-hospital setting. Thirty (73%) of these were placed successfully. The mean time to successful placement was 67 seconds for 28 attempts; three of the 31 insertions did not have times recorded by the paramedic. Paramedics listed the problems with FAST-1 insertion, including: (1) difficulty with adhesive after device placement (3 events); (2) failure of needles to retract and operator had to pull the device out of the skin (2 events); and (3) slow flow (1 event). Emergency department physicians noted two events of minor bleeding around the site of device placement.

Conclusion: This is the first study to prospectively evaluate the prehospital use of the FAST-1 sternal IO as a first-line device to obtain vascular access in the critically ill or injured patient. The FAST-1 sternal IO device can be a valuable tool in the paramedic arsenal for the treatment of the critically ill or injured patient. The device may be of particular interest to specialty disaster teams that deploy in austere environments.

EFFECT OF LIVE-FIRE TRAINING DRILLS ON FIREFIGHTERS' PLATELET NUMBER AND FUNCTION

Denise L. Smith, PhD, Steven J. Petruzzello, PhD, Eric Goldstein, MPP, Uzma Ahmad, MD, Krishnarao Tangella, MD, Gregory G. Freund, MD, Gavin P. Horn, PhD
ABSTRACT

Background. The leading cause of line-of-duty death among firefighters is sudden cardiac events. Platelets play a critical role in the formation of an occlusive thrombus during an ischemic event. **Objective.** The purpose of this study was to examine the acute effect of firefighting on platelet number and aggregability. **Methods.** Apparently healthy male **firefighters** ($N = 114$; age 29.4 ± 7.8 years) participated in 18 minutes of simulated firefighting activity in a training structure that contained live fires. Blood samples were obtained before and after simulated firefighting activity and analyzed for complete blood cell count (CBC), chemistry, and platelet number and function. Platelet function was measured using a PFA-100 analyzer to assess platelet aggregability. **Results.** As expected, performing firefighting activity resulted in significant increases in heart rate ($75 \text{ b} \cdot \text{min}^{-1}$) and core temperature (0.7°C), and significant changes in blood chemistry values. The most important finding in this study is that 18 minutes of simulated firefighting caused a 24% increase in platelet number and a significant increase in platelet aggregability. **Conclusions.** Firefighting resulted in a significant increase in platelet number and aggregability, indicating that even short bouts of firefighting can increase thrombotic potential in apparently healthy firefighters. **Key words:** thrombosis; platelet count; platelet function test; platelet aggregation; firefighter

PREHOSPITAL EMERGENCY CARE
2011;15:233-239

Received July 10, 2010, from the University of Illinois Fire Service Institute (DLS, SJP, EG, GGF, GPH), Champaign, Illinois; the Department of Health and Exercise Science (DLS), Skidmore College, Saratoga Springs, New York; the Department of Pathology (UA, KT, GGF), University of Illinois, Champaign, Illinois; and Christie Clinic (KT), Urbana, Illinois. Revision received September 4, 2010; accepted for publication September 10, 2010.

Supported by the Department of Homeland Security Assistance to Firefighters Grant [No. EMW-2006-FP-02459].

The authors report no conflicts of interest in this study.

Address correspondence and reprint requests to: Gavin Horn, PhD, University of Illinois Fire Service Institute, 11 Carty Drive, Champaign, IL 61820. e-mail: ghorn@fsi.uiuc.edu

doi: 10.3109/10903127.2010.545477

INTRODUCTION

While operating at a structure fire, firefighters perform strenuous physical work while wearing heavy personal protective equipment (PPE), often in hot environments and under physiologically stressful conditions. Firefighting results in significant cardiovascular and thermal strain as a result of this combination of strenuous work, heavy and insulating PPE, psychological stress, and environmental extremes. Of particular concern is the high rate of line-of-duty deaths attributable to sudden cardiac events: approximately 45% of line-of-duty deaths in the fire service.¹ Furthermore, a 2007 study by Kales and coworkers clearly demonstrated that the relative risk of suffering from a fatal cardiac event was 10-100 times greater following fire-suppression activities than during nonfire duties?

This page intentionally left blank.

II. EVALUATING RESOURCES

COMMON METHODOLOGIES

- Quantitative.
- Qualitative.
- Mixed methods.
- Applied approaches.

Slide 3-8

- A. Common methodologies.
- B. No matter which methodologies you use, all revolve around an unending circle of analysis.
 - 1. You start with your question, problem or issue.
 - 2. You gather data; interpret the data; act on the evidence; evaluate your results; and define the next steps.
 - 3. This is repeated for each methodology used.
- C. As you read through your collected information, how do you determine what is good and what is to be discarded?
- D. Perhaps you need a guideline to help sort through your facts, data, evidence or experiences in your collection.

QUANTITATIVE

- Study of the number of items making up an object or the study of quantities which is an objective finding.

Slide 3-9

1. Quantitative is the study of the number of items making up an object or the study of quantities which is an objective finding.

QUANTITATIVE (cont'd)

- Usability testing.
- Experimental.
- Quasi-experimental.
- Nonexperimental.
- Correlation.
- Survey research.
- Causal comparative.
- Observational.

Slide 3-10

2. Quantitative: numerical/statistical.
 - a. Usability testing.
 - b. Experimental.
 - c. Quasi-experimental.
 - d. Nonexperimental.
 - e. Correlation.
 - f. Survey research.
 - g. Causal comparative.

h. Observational.

QUALITATIVE

- Researching technique used to gather information that seeks to answer the question of why things are as opposed to simply quantifying the data.
- Used to gain insight into peoples' attitudes, beliefs, values, motivations and aspirations.

Slide 3-11

3. Qualitative is a researching technique used to gather information that seeks to answer the question of why things are as opposed to simply quantifying the data. It is used to gain insight into peoples' attitudes, beliefs, values, motivations and aspirations.

QUALITATIVE (cont'd)

- Interviews.
- Focus groups.
- Observation.
- Case study.
- Content analysis.
- Phenomenology.
- Ethnography.

Slide 3-12

4. Qualitative: nonnumerical (i.e., words, images, text).
- a. Interviews.
 - b. Focus groups.
 - c. Observation.
 - d. Case study.
 - e. Content analysis.

6. Mixed methods: synthesis of both qualitative and quantitative data.
 - a. Triangulation.
 - b. Explanatory.
 - c. Embedded.
 - d. Exploratory.

APPLIED APPROACHES

- Used internally by an organization to solve specific problems or meet a specific need.
 - Plan, do, check, act.
 - Design, Measure, Analyze, Improve, Control (DMAIC).
 - Program evaluation.
 - Appreciative inquiry.
 - Action research.

Slide 3-15

7. Applied approaches.
 - a. Plan, do, check, act.
 - b. Design, Measure, Analyze, Improve, Control (DMAIC).
 - c. Program evaluation.
 - d. Appreciative inquiry.
 - e. Action research.

EVALUATION APPROACHES

- Author's purpose?
- Key question or approach author raises?
- Information, data and/or evidence author presents?
- Key concepts author uses?
- Key conclusion author comes to?
- Author's primary assumptions?
- Viewpoint author is writing from?
- Implications of author's reasoning?

Slide 3-16

E. You can approach your evaluation of each type of methodology in a similar fashion by consulting the basic structure of reasoning.

1. What is the author's purpose?
2. What key question or problem does the author raise?
3. What information, data and/or evidence does the author present?
4. What key concepts does the author use to organize this information, this evidence?
5. What key conclusion is the author coming to? Are those conclusions justified?
6. What are the author's primary assumptions?
7. From what viewpoint is the author writing?
8. What are the implications of the author's reasoning?

ACTIVITY 3.2

Evaluate Gathered Materials

Purpose

To apply critical thinking skills to evaluate and determine the validity of the research of others.

To critique selected information and data for validity.

Directions

1. Previously, you began the assessment of the collected statistical data. The assessment should have included a comparison of selected statistical data against your topical goal — what you are trying to prove — your intent.
2. You should begin the evaluation of your gathered materials as you start the composition of your final project (if you haven't already).
3. Working in your small group in the classroom or breakout rooms, each person will evaluate each other's research problem. The partner should respond with some "what if or did you think about this" concerning the data. Each person should place himself or herself in the position of the person approving this research project for funding or personnel allocations and give the other person an answer of "you need more information or your picture is clear."

This page intentionally left blank.

ACTIVITY 3.3

Literature Review

Purpose

To tie in all components of a literature review.

Directions

1. Using the article from Day One, you will conduct a literature review.
2. You will identify:
 - a. Purpose of the research. yes no
 - b. Problem statement. yes no
 - c. Use theory as a guide. yes no
 - d. Specific concept or construct being examined. yes no
 - e. Relevant to current practices or objectives. yes no
 - f. Applicable to current practices or objectives. yes no
 - g. Article fit all three components of the Venn diagram. yes no
 - h. Article is considered a primary or secondary source. yes no
 - i. Method or approach used to conduct research. yes no
 - j. Overall findings and results identified. yes no
 - k. Identified implications and conclusions. yes no
3. Be prepared to discuss your findings.

This page intentionally left blank.

This page intentionally left blank.

UNIT 4: DOCUMENTING RESEARCH

TERMINAL OBJECTIVE

The students will be able to:

- 4.1 *Apply the appropriate mode of writing when documenting a research project.*

ENABLING OBJECTIVES

The students will be able to:

- 4.1 *Identify commonly used modes of writing and types of research writing.*
 - 4.2 *Differentiate the commonly used modes of writing and types of research writing.*
 - 4.3 *Explain when each mode of writing and type of research writing should be utilized.*
 - 4.4 *Explain the benefits and challenges of collaborative writing.*
-

This page intentionally left blank.



**UNIT 4:
DOCUMENTING RESEARCH**

Slide 4-1

ENABLING OBJECTIVES

- Identify commonly used modes of writing and types of research writing.
- Differentiate the commonly used modes of writing and types of research writing.
- Explain when each mode of writing and type of research writing should be utilized.
- Explain the benefits and challenges of collaborative writing.

Slide 4-2

I. MODES OF WRITING

SELECTING A MODE

- Four basic modes of writing:
 - Descriptive.
 - Narrative.
 - Expository.
 - Persuasive.
- Influences on selecting the proper mode.
- Eight questions to ask yourself about the audience.

Slide 4-3

- A. Modes of writing, forms of writing, types of writing, domains of writing — whatever you want to call them, there are different categories for writing. Each mode has a specific purpose. There are four basic modes: descriptive, narrative, expository and persuasive. These basic modes can be broken down into subcategories as well. Many of the subcategories are listed; however, there are many more depending on the mode of writing.
- B. There will be many influences when selecting the mode of writing to use. Topic, audience, genre, style, opportunity, research, the writer and purpose are just a few elements that make up the rhetorical situation. Topic and audience are often very intertwined and work to inform each other. Start with a broad view of your topic such as the Incident Command System (ICS), apparatus purchasing, advanced life support (ALS) response, quality assurance program, or ambulance system funding and then try to focus or refine your topic into a concise thesis statement by thinking about your audience. Here are some questions you can ask yourself about the audience:
1. Who is the audience for your writing?
 2. Do you think your audience is interested in the topic? Why or why not?
 3. Why should your audience be interested in this topic?
 4. What does your audience already know about this topic?
 5. What does your audience need to know about this topic?
 6. What experiences has your audience had that would influence them on this topic?
 7. What do you hope the audience will gain from your text?
 8. What characteristics do you and your audience have in common: national, culture, gender, location, family, neighborhood, volunteerism? For example, imagine that your broad topic is ambulance system funding. Who is your audience? You could be writing to city councilors, board members, or voting citizens or financial experts? Each of these groups would have different experiences with and interests in the topic of ambulance system funding. While elected officials might be more concerned with increasing taxes, voting citizens might be more concerned with losing their neighborhood ambulance.

SELECTING A MODE (cont'd)

- Can you tie in related topics?
 - Topic — Ambulance system funding.
 - Related — Medicare reimbursement, fuel, apparatus age/replacement, employee costs, lack of alternate patient destinations.
 - Do you need to write two texts because of different audiences?
 - Cultivate common ground.

Slide 4-4

C. You can also think about opportunity as a way to refine or focus your topic by asking yourself what current events make your topic relevant at this moment. For example, you could connect the decreases in Medicare reimbursement, lack of alternate patient destination, and medication shortages to the rising costs to provide service overall. Ultimately, cultivate common ground.

DESCRIPTIVE WRITING

- Describes a person, place or event in great detail.
- Uses the five senses.
 - Taste.
 - Smell.
 - Touch.
 - Sight.
 - Hearing.

Slide 4-5

D. The primary purpose of descriptive writing is to describe a person, place or event so that the topic can be clearly seen in the reader's mind. The writer must use vivid details that paint a picture for the reader. The writer attempts to make the readers see, feel and hear what he or she has seen, felt and heard. The writing style is expressive and may include descriptions, opinions, comparisons, personal perceptions and sensory perceptions. The main objective of a descriptive essay is to relate the unique qualities of the person, object, etc. vividly and comprehensively. General characteristics of descriptive writing are:

DESCRIPTIVE WRITING (cont'd)

- General characteristics:
 - Capture the reader's interest.
 - Visualization.
 - Sensory experience.
 - Objective versus subjective.

Slide 4-6

1. Capture the reader's interest: A descriptive essay should make for interesting reading. The writer has to make the greater emphasis on aspects that are more likely to concern or interest customers, such as gas mileage, safety features, speed control, performance collection devices, maintenance reliability, or add-on features which add service capability such as bariatric units.
2. Visualization: Descriptive essays are based more on "show" than "tell" giving readers a visual idea of the subject. An example of a "tell" sentence would be, "The sun disappeared into the water." The same sentence in "show" mode might read, "The setting sun disappeared in a blaze of red and gold glory, swallowed up, it would seem, by the vast expanse of the Pacific Ocean." Through vivid depictions, the writer conveys to readers individual impressions based on emotions or perceptions.
3. Sensory experience: Descriptive essays make use of the five senses. The writer effectively conveys personal perceptions on the subject through the use of sensory details and figurative details. Sensory details are those that appeal to the five senses while figurative details involve the use of similes and metaphors to describe the subject. The use of sensory details makes the essay more vibrant and appealing to the readers' imagination. For example, graphic descriptions of odors, pleasant or unpleasant, allows readers to "experience" smells.
4. Objective versus subjective viewpoint: A descriptive essay can be either objective (concrete, factual) or subjective (personal). The type of essay that a writer creates will be determined by the kind of emotion that the writer wants to elicit from readers. Presenting a purely objective viewpoint can be difficult. Conversely, a writer can reduce subjectivity in an essay by including more objective factors, like size, color, shape and distance, exhausting them before injecting personal opinions or feelings.

NARRATIVE WRITING

- Tells a story about a person, place or event.
- Uses characters, dialogue.
- Has a plot with a climax and resolution.
 - Beginning.
 - Middle.
 - End.

Slide 4-7

- E. The primary purpose of narrative writing is to describe an experience, event or sequence of events in the form of a story. This mode of writing involves the production of stories or personal essays. Writers are encouraged to use their creativity and powers of observation to develop stories that can capture a reader’s imagination — the art of telling a great story. The following are general characteristics of narrative writing.

NARRATIVE WRITING (cont'd)

- General characteristics:
 - Plot.
 - Conflict.
 - Characterization.
 - Setting.
 - Theme.
 - Point of view.
 - Sequencing.
 - Transition.

Slide 4-8

1. Plot: This is a literary term for the events a story comprises, particularly as they relate to one another in some type of pattern, a progression or a sequence, through cause and effect, or by coincidence.
2. Conflict: This is an opposition of people, forces or other entities. When thinking about conflicts, it’s important to be clear about how the character deals with conflicts, by focusing on the contradictory emotions within a person that make him or her behave the way he or she does.

3. Characterization: This is the process of passing on information about characters in narrative or dramatic works of art. Characters may be presented by means of description through their actions, speech or thoughts.
 4. Setting: This is where the story takes place and is an important part of telling a story. The setting gives the story distinctiveness and is as important as the characters.
 5. Theme: This is the unifying subject or idea of a story. It is the main idea, moral or message, whether it be about one's life or society in general.
 6. Point of view: This focuses on who is telling the story. There are the views of the first person, second person and third person as well as the alternating person view. For example, while the general rule for novels is to adopt a single approach to point of view throughout the story, there are exceptions. Many stories, especially in literature, alternate between the first and third person. In this case, an author will move back and forth between a more "all-knowing" third-person narrator to a more personal first-person narrator.
 7. Sequencing: This is a symbolic linear depiction known as a sequence or timeline on how things and events unfold in a story. On occasion, novels will have flashbacks or flash forwards that disrupt the normal sequencing of a storyline.
 8. Transition: This is a process or period in which the story undergoes a change and passes from one stage, action or activity to another.
- F. Personal narrative writing has a primary purpose of sharing an experience or event from the author's own life.

There are some differences between narrative and descriptive writing. Narrative writing usually refers to recounting events, focusing more on the events themselves rather than on details, while descriptive writing adds in those details using imagery and invoking one or more of the five senses. Narratives "tell" while descriptive writing "shows" what's going on.

EXPOSITORY WRITING

- To inform or explain something.
- May include directions or “how to” information, why or how something was done.
- Writer’s job is to explain his or her special knowledge of the subject.
- History, science, math books contain expository writing.

Slide 4-9

G. The primary purpose of expository writing is to provide information such as an explanation or directions. Expository communicates information to the reader to share knowledge or to convey messages, instructions and ideas. Expository writing is usually focused on specified subjects in a variety of formats such as reports, reviews and letters. The following are general characteristics of expository writing.

EXPOSITORY WRITING (cont'd)

- General characteristics:
 - State the main idea (must be narrow).
 - Support ideas using quotes, statistics, examples and/or facts.
 - Information is logically organized.
 - Show commitment to the topic.
 - Conclude the writing.

Slide 4-10

1. State the main idea: This must be narrow enough to be supported in the writing.
2. Support ideas using quotes, statistics, examples and/or facts: Use any available resource to instruct the reader including published books, television, Internet, etc.
3. Information is logically organized: Depending on the type of expository that is being written, the information could be organized chronologically, from least important to most important or from most important to least important.

4. Show commitment to the topic: Supporting details do not deviate from the topic.
5. Conclude the writing: Restate the topic and main supporting ideas.

TYPES OF EXPOSITORY WRITING

- Types of expository writing:
 - Business.
 - Compare and contrast.
 - Informative.
 - Literary response.
 - Process.
 - Reaction.
 - Cause and effect.
 - Definition.
 - Problem and solution.

Slide 4-11

- H. There are nine different types of expository writing.
1. Business writing: The primary purpose is to communicate with others in the workplace.
 2. Compare and contrast writing: The primary purpose is to show the similarities and differences between two subjects.
 3. Informative writing: The primary purpose is to provide information in a clear, concise manner.
 4. Literary response: The primary purpose is to provide a personal reaction to a piece of literature.
 5. Process writing: The primary purpose is to explain the steps or procedure of something.
 6. Reaction writing: The primary purpose is to provide a personal response to something.
 7. Cause and effect: The primary purpose is to analyze the reasons for, and/or the consequences of, an action, event, or decision. You have to consider two strategic points.
 - a. Are you exploring causes or effects or both?
 - b. What is the order of the causes or effects you're going to pursue, from least to the most important or vice versa?

- 8. Definition: The primary purpose is to explain a term or concept by listing and examining its qualities and characteristics. A description paper often takes a person or object and describes that person or thing in great illustrative detail.
- 9. Problem and solution: The primary purpose is to examine aspects of a complex problem and explore or propose possible solutions.

PERSUASIVE WRITING

- Persuades the reader to do something or believe a certain way.
- Commercials are persuasive writing.
- Politicians' speeches are persuasive writing.
- Letters to government officials or businesses may be persuasive writing.

Slide 4-12

- I. The primary purpose of persuasive writing is to give an opinion and try to influence the reader's way of thinking with supporting evidence. Persuasive writing seeks to influence the reader to take some action or bring about change. It may contain factual information, such as reasons, examples or comparisons; however, its main purpose is not to inform but to persuade. The following are general characteristics of persuasive writing.

PERSUASIVE WRITING (cont'd)

- General characteristics:
 - Not too long nor too short.
 - Written from a reader's perspective.
 - Support ideas with facts and quotes.
 - State a clear conclusion.

Slide 4-13

- 1. Not too long nor too short: You don't have to write a lengthy thesis statement to deliver your messages. A comprehensive piece of writing works best to convince the readers.

2. Written from a reader’s perspective: Make sure you don’t write from your own (writer’s) perspective in writing a persuasive essay. Unlike other essay types, persuasive essay fails to catch the reader’s attention if it is written from a writer’s perspective. Instead, if it is written from the reader’s perspective, the persuasive essay looks interesting and persuading.
3. Support ideas with facts and quotes: Readers always believe the facts included in your essay. Try to include some medical reports, public surveys, newspaper headlines, etc. to make your essay more persuasive. Keep in mind that none will be convinced if your essay is dull and without any fact. Quotations from well-known people work equally well too.
4. State a clear conclusion: End your essay with your clear judgment or conclusion. Never end your essay without a clear conclusion or you will fail to deliver your messages. A clear conclusion of your persuasive essay will stay in the reader’s mind for a long time.

PERSUASIVE WRITING (cont'd)

- Challenge is to overcome resistance:
 - Compliance.
 - Identification.
 - Internalization.

Slide 4-14

- J. Persuasion is central to much of the writing and presenting that you do in the fire service. Whenever your goals include convincing others of the effectiveness of your ideas, you must employ persuasive communication. There are established steps that ensure success. Realize that, in most situations, you will encounter a degree of resistance from your audience. People need good reasons to change. Your challenge is to overcome that resistance. Research has shown that people yield to persuasion in three different ways:
1. Compliance: This is the least productive response. Those who comply do not actually change. They comply in order to avoid repercussions or to ensure award.

2. Identification: This is better than compliance. Those who identify with you will want to yield to your line of reasoning because they respect you and want you to like them.
3. Internalization: This is the best response. Those who internalize your ideas will actually change the way they think about an issue based on what you have written or said. They realize that your ideas are sound and beneficial to them.

PERSUASIVE WRITING (cont'd)

- Constraints.
- Ethical issues.
- Loyalty versus blind loyalty.
- Tone.
 - Emotional appeal.
 - Nonemotional appeal.

Slide 4-15

- K. Effective communicators recognize constraints that govern what they can communicate in a given situation and how they can present the material.
 1. What exactly can I communicate in this situation?
 2. What personalities must I deal with?
 3. How should I transmit the material, in person, by phone or email, or some other method?
 4. Are there legal issues at stake?
 5. What may be the resistance to the material?
 6. Is this the best time to present the material?
- L. Other constraints come in the form of deadlines, ethical issues, and chain of distribution. With constraint, it is good to ask yourself pertinent questions.
 1. Do you have time to complete the project with the resources available?
 2. Do you have the capability to collect the data needed to effectively support your argument?

3. Beyond legal questions, are you entirely honest in your communication? Do you exaggerate your data or research? Are your sources reliable?
- M. Ethical issues also extend to certain public issues, including women's and minority's rights as well as employee standards and environmental concerns. How you communicate these issues depends in large degree upon the stated and, sometimes, unstated policies of your department. Be aware, however, that some actions, including poorly worded documents, can bring serious consequences, such as legal action by individuals or groups who feel that their rights have been ignored or violated.
1. Does your department have a stated policy on minorities, women and protected classes? Just because the issue or topic is addressed by federal law doesn't preclude your department from addressing the issue up front. Could this situation become a problem without some sort of written policy?
 2. If appropriate, does your department have a specific policy regarding environmental impact, sexual harassment, workplace violence, etc.? Does the policy address how these issues will be managed?
- N. These situations and others like them require not only your ethical consideration but your persuasive techniques as well. Unfortunately, ethical considerations are often overlooked in certain business settings, especially when the profit margin is at stake or when strong personalities push a worker to falsify or misrepresent information. As the author of an applied research project could you be influenced in your interpretation of data or a situation? Loyalty to an organization is commendable, but blind loyalty can bring trouble. As a technical writer, you should be prepared to make difficult decisions about how and what you communicate. There are no easy answers.
1. Have you chosen the correct tone for your project? Do not patronize or write down to subordinates or shield superiors from issues.
 2. Have you chosen the correct model of communication? While emotion can work in your favor, beware of using too much emotion in your appeal.
 - a. Emotional appeal: "If you love your family, you'll make sure to vote for the fire levy. You can sleep well knowing we are on duty." This statement uses emotion negatively. If you do not vote for the levy, you must not love your family. Emotion can be used effectively, however, only in certain situations. An editorial designed to raise readers' consciousness about an issue might use emotions very effectively; however, make sure the facts are straight.

- b. Nonemotional appeal: An objective point of view without judgment or an appeal to readers' sympathies works best for technical writing. Remember the acronym "SAY IT."

S - State your subject
A - Know your audience
Y - Identify yourself
I - Intention, why you are writing
T - Tone

II. RESEARCH WRITING

RESEARCH WRITING

- There are two types of research writing: academic and technical.
- Academic research writing is reporting new information that has been learned by studying available resources.
- There are two academic research styles.
 - Argumentative.
 - Analytical.

Slide 4-16

- A. There are two types of research writing: academic and technical. The primary purpose of academic research writing is reporting new information that has been learned by studying available resources. An academic research paper is a genre of writing that emphasizes the combination of personal insights and secondary material gathered through focused research and investigation of a particular topic. As stated in Purdue University's online writing resource center, the Owl Writing Lab, a research paper "is the culmination and final product of an involved process of research, critical thinking, source evaluation, organization, and composition." By definition, the essence of a research paper is to combine primary and secondary information, guided by a provable thesis or claim, to arrive at a new or enlightened conclusion about the topic. A research paper differs from other genres of academic writing in that it attempts to offer interpretations stemming from investigations into the subject from other sources rather than mere summaries of the topics.

RESEARCH WRITING (cont'd)

- Argumentative research.
 - The goal is to persuade.
 - Communicate your stance on the chosen topic in the form of a thesis statement.
 - Typically stems from a debatable issue that contains potential refutation that the writer's research will need to address.

Slide 4-17

1. Argumentative research: The goal of an argumentative research paper is to persuade. Therefore, the writer must clearly decide and communicate his or her stance on the chosen topic in the form of a thesis statement. The thesis of an argumentative research paper typically stems from an issue, one that can be debated and contains potential refutation that the writer's research will need to address. According to the Owl, ideally, "the student would support this thesis throughout her paper by means of both primary and secondary sources, with the intent to persuade her audience that her particular interpretation of the situation is viable."

RESEARCH WRITING (cont'd)

- Analytical research.
 - Poses a question that requires further investigation.
 - The writer takes no stance, remains objective.
 - Overcome predetermined ideas or notions.

Slide 4-18

2. Analytical research: Unlike the argumentative paper, which forces the writer to take a definitive stance on a topic, the analytical paper poses a question by the writer that requires further investigation. This question is referred to as the "research question" and is the driving force behind the analytical paper; it requires that the writer take no stance and remain objective throughout his or her investigation of the topic. In an analytical paper, as defined by the Owl, "it is not the student's intent to persuade the audience that his ideas are right while those of others are wrong. Instead,

his goal is to offer a critical interpretation of primary and secondary sources throughout the paper — sources that should, ultimately, buttress his particular analysis of the topic.”

Why is this type of writing so difficult? Because when most writers sit down, they have a predetermined plan, outline, flow or notion about their subject or question. The research writing process is recursive, meaning writers cannot expect to take a linear approach to their research. They must, to a certain extent, give up a predetermined idea or notion and allow the research process to lead them to a new conclusion, maybe even one they might not have considered.

3. Argumentative versus analytical research papers. The argumentative research paper consists of an introduction in which the writer clearly introduces the topic and informs his or her audience exactly which stance he or she intends to take; this stance is often identified as the thesis statement. An important goal of the argumentative research paper is persuasion, which means the topic chosen should be debatable. The analytical research paper often begins with the student asking a question (aka a research question) on which he or she has taken no stance. Such a paper is often an exercise in exploration and evaluation.

RESEARCH WRITING (cont'd)

- Technical research writing.
 - Conveys technical information in a simple, no-nonsense manner.
 - Uses specialized vocabularies (technology, health).
 - Subject matter is more important than the writer’s voice; technical writing style uses an objective, not a subjective tone.
 - Direct, utilitarian, emphasizing exactness and clarity.

Slide 4-19

- B. The primary purpose of technical writing is conveying technical information in a simple, no-nonsense manner. Technical writing is predominantly used in fields with specialized vocabularies, such as science, engineering, technology and the health sciences. In the “Handbook of Technical Writing” (2006), it states:

“The goal of technical writing is to enable readers to use a technology or understand a process or concept. Because the subject matter is more important than the writer’s voice, technical writing style uses an objective, not a subjective, tone. The writing style is direct and utilitarian, emphasizing exactness and clarity rather than elegance or allusiveness. A technical writer

uses figurative language only when a figure of speech would facilitate understanding.”

These are some general characteristics of technical writing.

1. Purpose: getting something done within an organization (completing a project, persuading a customer, pleasing your boss, etc.).
 2. Your knowledge of topic: usually greater than that of the reader.
 3. Audience: often several people, with differing technical backgrounds.
 4. Criteria for evaluation: clear and simple organization of ideas, in a format that meets the needs of busy readers.
 5. Statistical and graphic support: frequently used to explain existing conditions and to present alternative courses of action.
- C. Collaborative writing can be an exercise in productive teamwork that results in a successful project, or it can be the most frustrating writing experience imaginable. Here are some approaches that work:
1. Determine a role for each person in the group and set an agenda with challenging goals that lead to completion of the project.
 2. Establish a communication loop through emails, memos and group meetings.
 3. Clarify ground rules for working together.
 4. Encourage participation from everyone in the group by carefully describing each person’s responsibilities.
 5. Do not be afraid of conflict within the group. Often such conflict, when intelligently debated, can move the group beyond “group think.”

ACTIVITY 4.1

Modes of Writing

Purpose

To identify the difference between the modes of writing, provide examples of when the selected mode could be used, and predict how the author might be influenced by the selected mode. Provide techniques to narrow the focus of a topic and predict successes and pitfalls when using a collaborative approach to writing.

Directions

1. Each table will be assigned one of the following modes:
 - a. Descriptive.
 - b. Expository.
 - c. Persuasive.
 - d. Research.
 - e. Narrative (if needed).
2. Each table will answer the following questions for the assigned mode:
 - a. What is the purpose of the assigned mode?
 - b. Illustrate some examples of when the assigned mode would be used in fire and Emergency Medical Services (EMS) communication.
 - c. Predict how the author might be influenced or use the assigned mode to his or her advantage.
 - d. How would the author ensure the accuracy and credibility of the resources used?
 - e. Provide some techniques that could be used to narrow the focus of a topic when using a collaborative approach.
 - f. Discuss some potential successes and pitfalls if using a collaborative approach.
3. Each table has 30 minutes to complete the questions.
4. Groups will select a speaker and report their responses and why.

This page intentionally left blank.

This page intentionally left blank.

APPENDIX

PROJECT STATUS BRIEFING

This page intentionally left blank.

Project Status Briefing

Name: _____

Organization's Name: _____

1. **Problem/Opportunity Statement:**
2. **Consequences of Status Quo:**
3. **Stakeholders:**
4. **Projected Proposal (SMART):**
5. **Fishbone and/or Venn diagram and/or Failure Modes and Effects Analysis**
6. **Sources:**
 - How many:
 - Examples:
 - Elaborate on one source (citation, authority, reliability, currency, completeness, relevancy):

 - If no sources found:
 - Five examples of search engines and five examples of search parameters used:
7. **Description of the next steps to implement the project upon return to home agency.**

(Optional) Email Address: _____

This page intentionally left blank.

APPENDIX

EMERGENCY MEDICAL SERVICES CONCEPTS

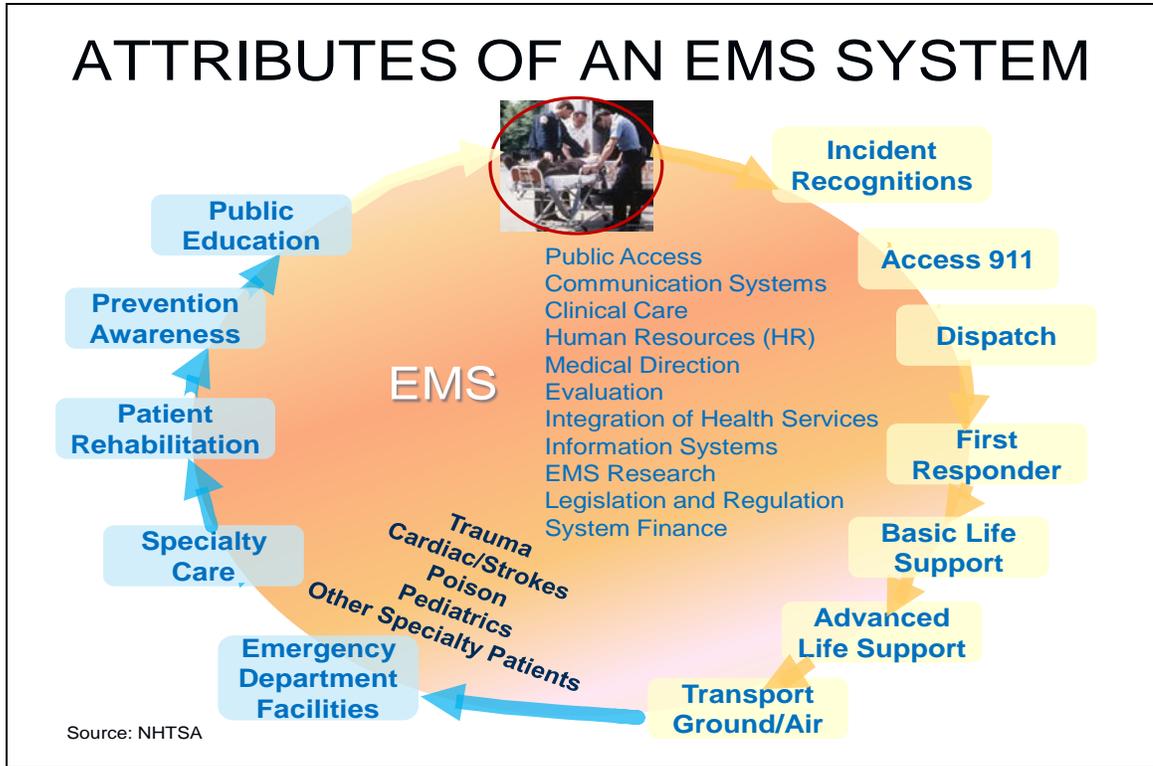
This page intentionally left blank.

EMERGENCY MEDICAL SERVICES CONCEPTS

**EMS AGENDA VISION
STATEMENT**

Emergency Medical Services (EMS) of the future will be community-based health management that is fully integrated with the overall health care system. It will have the ability to identify and modify illness and injury risks, provide acute illness and injury care and follow-up, and contribute to the treatment of chronic conditions and community health monitoring. This new entity will be developed from redistribution of existing health care resources and will be integrated with other health care providers and public health and public safety agencies. It will improve community health and result in more appropriate use of acute health care resources. EMS will remain the public's emergency medical safety net.

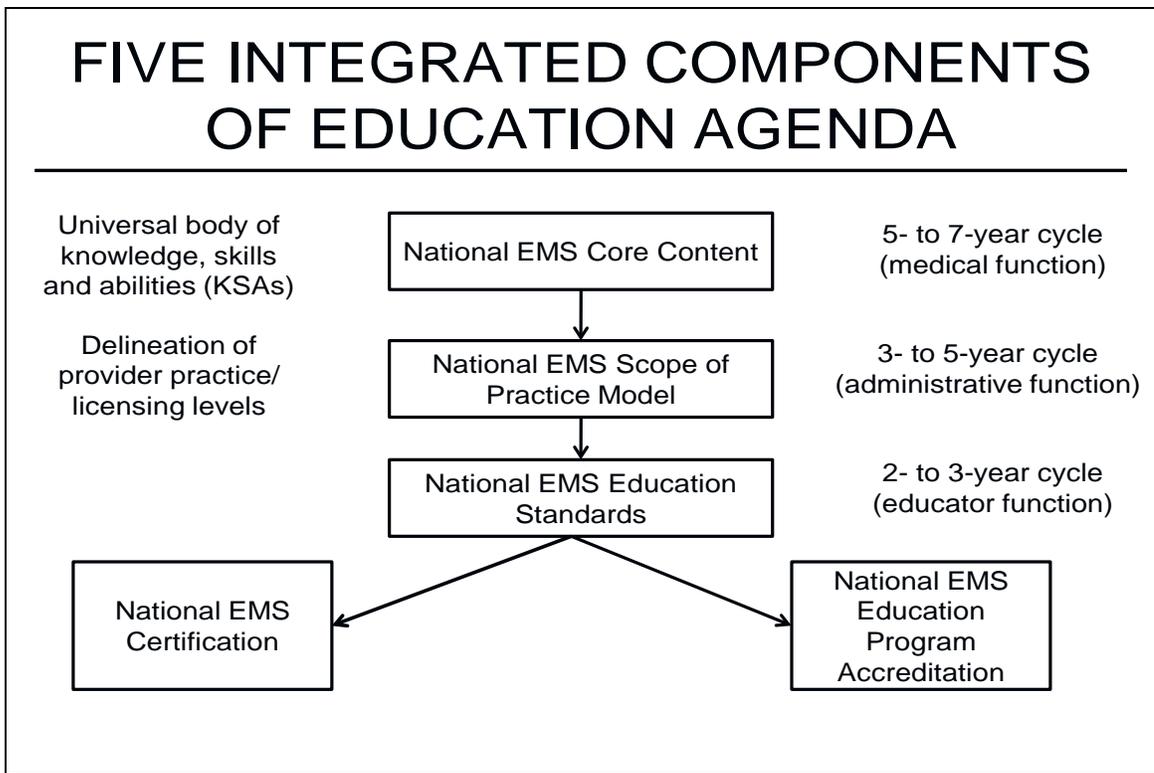
-
-
-
-
-
-
- A. Up to this point, the audience and the context of actions have been suggested as influences on EMS.



B. To support this vision, these attributes have been identified as defining an EMS system.

1. Public access.
2. Communication systems.
3. Clinical care.
4. Human resources (HR).
5. Medical direction.
6. Evaluation.

7. Integration of health services.
 8. Information systems.
 9. EMS research.
 10. Legislation and regulation.
 11. System finance.
- C. The National Highway Traffic Safety Administration (NHTSA) has developed a new education agenda to supplement the EMS Agenda for the Future.



- D. The previous 11 attributes are supported by the five integrated components of the education agenda.
 - 1. The first three system components are sequential. The core content is the foundation of the scope of the practice. From the scope, standards are developed.
 - 2. The core content contains the universal EMS body of knowledge, skills and abilities (KSAs).
 - a. It will specify **what** knowledge and skills are necessary in the out-of-hospital setting and determine **how** these tasks will be performed.
 - b. The focus is on the medical function and will be re-examined every five to seven years.
 - 3. The scope of the practice model will provide a delineation of provider practice and licensing levels.
 - a. This component will specify **who** (the level of practice) will perform specific skills and how much knowledge providers should possess at each level.
 - b. The focus is on the administrative function and will be re-examined on a three- to five-year cycle.
- E. The education standard will replace the NHTSA national standard curricula and prescribe how to teach the knowledge and skills at each provider level. The focus is on the educator function and will be re-examined on a two- to three-year cycle.
- F. Certification will be conducted by a single independent national agency under the leadership of a board of directors with multidisciplinary representation.
- G. An accreditation program will provide standards and guidelines for each level of EMS education and provide consistency across state lines.
- H. With this concept in mind, consider the components of the EMS Agenda for the Future.
- I. From the EMS agenda, predictions have been made about the nature of the future and the environment in which EMS will exist.

EMS AGENDA PREDICTIONS

- EMS = the intersection of public safety, public health and health care systems.
- Diverse local forms.
- Continual evolvment as health care system component.
- Increasing need for information regarding EMS systems and outcomes.

-
-
-
-
-
- J. These predictions are influential concepts. Some of the predictions made are as follows:
1. EMS will represent the intersection of public safety, public health and health care systems.
 2. EMS will continue in some form; and the public expects it to continue. EMS will continue to be diverse at the local level.
 3. As a component of health care systems, EMS will be influenced significantly by the health care systems' continuing evolution.
 4. There will be an increasing need for information regarding EMS systems and outcomes.

EMS AGENDA PREDICTIONS (cont'd)

- EMS system-related decisions based on limited information.
- Media influential in public perception of EMS.
- Decrease in federal funding/financial resources.
- Public policymakers need to be well-informed regarding EMS issues.

-
-
-
-
-
5. It will be necessary to continue to make some EMS system-related decisions on the basis of limited information.
 6. The media will continue to influence the public's perception of EMS.
 7. Federal funding/financial resources will be decreasing.
 8. To make good decisions, public policymakers will need to be well-informed about EMS issues.