

Trooper-Trainee Active Countermeasures Training Evaluation

Prepared for
The Texas Department of Public Safety
Austin, Texas

Fabrice Czarnecki, M.D., M.A., M.P.H.
Richard Miller, M.D.

The Gables Group, Inc.
Miami, Florida
info@gablesgroup.com

March 2006

Table of Contents

Executive Summary	3
List of Recommendations	5
Introduction	9
TXDPS Candidate Medical Screening (Pre-placement)	10
TXDPS Academy Medical Screening	13
TXDPS Academy Injuries and Return to Training Medical Procedures	15
TXDPS Academy Training Program—Overview	18
TXDPS Academy Physical Training	19
TXDPS Academy Defensive Tactics Training	
Overview	21
Survival and Control Tactics Training	23
Protective Equipment	26
Review of Selected Police Defensive Tactics Training Organizations	28
Head Injury Rate Analysis	33
Recommendations for Reducing Serious Head Injuries during TXDPS Academy	
Survival and Control Tactics Training	35
Attachment 1. TXDPS Staff Interviewed during Site Visit	38
Attachment 2. TXDPS Documents and Videos Reviewed	39
Attachment 3. Head Injuries in Force-on-Force Survival and Control Tactics Training, 12/16/03—5/19/05	41
Attachment 4. Martial Arts for Cops, The Dark Side - Fists of Frenzy	42
Attachment 5. Possible providers of appropriate protective equipment	46
Attachment 6. Training Organizations	48
Attachment 7. IADLEST Survey	49
Attachment 8. Role of a Law Enforcement Agency Occupational Medicine Physician	
Attachment 9. Recommendations for Enhanced Candidate Cardiac Screening	52
Attachment 10. Recommendations for Blood Pressure Guidelines during Academy Training	56
Attachment 11. Recommendations for Reducing Serious Head Injuries during Survival and Control Tactics Training	57
Attachment 12. Sport Concussion Assessment Tool (SCAT)	63
Attachment 13. References	66

Executive Summary

This report is presented in response to the request from the Texas Department of Public Safety (TXDPS) to conduct a study of the current Active Countermeasures Training program utilized by the Department to train Trooper-Trainees in the Training Academy and advise the agency on new or alternative training programs, methodologies, techniques, equipment or other related factors that could improve and/or enhance the safety and overall effectiveness of the program.

As a part of this evaluation, we performed an extensive review of the current TXDPS Academy program and injuries, research on the use of boxing as a law enforcement training tool, research on evaluating and treating sports-related head injuries, and an analysis of other law enforcement training methods.

The following visits were made as a part of this evaluation:

TXDPS Academy, Austin, TX	January 10-12, 2006
U.S. Secret Service Academy, Beltsville, MD	January 31, 2006
Federal Law Enforcement Training Center, Brunswick, GA	February 7-8, 2006
New Jersey State Police Academy, Sea Girt, NJ	February 14, 2006
Florida Highway Patrol Academy, Tallahassee, FL	February 20, 2006

Key Recommendations

Key Recommendation: TXDPS should discontinue boxing-based exercises, and replace them with a scenario-based simulation training program.

TXDPS uses full force, toe-to-toe simulation, or boxing, in its Survival and Control Tactics training, the culmination of its Active Countermeasures training. Our review of the TXDPS Survival and Control Tactics training reveals a significant rate of serious head injuries over the past two years, significantly greater than other law enforcement agency training programs, even those currently using boxing.

This type of training has its strong supporters and detractors, but the clear trend in law enforcement training is to move away from toe-to-toe full force simulation training and towards scenario-based training that is likely to avoid head strikes. The Federal Law Enforcement Training Center and the Florida Highway Patrol have all discontinued boxing in their training programs. We recommend that TXDPS discontinue boxing in its Survival and Control Tactics training.

Enhancing medical screening procedures or modifying protective equipment, such as head gear, will not significantly reduce future serious head injuries due to boxing. If boxing is continued, which we do not recommend, reduction of future serious head injuries would require changing the way that boxing is conducted,

and allocating significant additional resources to the boxing program. Specifically, several trained instructors would have to monitor each pair of recruits continuously throughout each fight. Also, more stringent safety procedures would have to be strictly observed, and post-fight medical screening in case of injury would have to be mandatory.

This report provides defensive tactic simulation alternatives to the current TXDPS Survival and Control Tactics training, which should achieve the same training goals with significantly fewer training injuries.

Key Recommendation: TXDPS should change safety procedures for Survival and Control Tactics Training

This report includes our recommendations for improved safety procedures for Survival and Control Tactics training.

Key Recommendation: TXDPS should regularly collect and analyze data on recruit training injuries

This report includes our recommendations on how to collect and review data on recruit training injuries.

List of Recommendations

Current defensive tactics program

TXDPS should discontinue the current Survival and Control Tactics program, including the grappling (role playing) and the force-on-force (full force) exercises

- The Survival and Control Tactics program, in its current form, causes too many serious injuries, and does not involve realistic police tactics
- The rate of head injury and the rate of serious head injuries were significantly greater at TXDPS than at the other public and private training facilities that we surveyed

Simulation training

- TXDPS should implement a scenario-based simulation training program, as part of the current Arrest and Control Tactics program
- Only role-players who are trained instructors should engage in physical contact with, or fire projectiles from simulated firearms at, students during confrontational simulations
- Students should never engage in physical contact with other students during simulations, with the exception of defensive tactics training where recruits are not using strikes or hard physical contact against other recruits
- Some scenarios should include multiple assailants and groundfighting and use of the baton
- Instructor role-players should be trained in confrontational simulations
- Instructor role-players should use an appropriate protective suit
- The type of training should dictate the type of protective equipment that recruits wear; recruits may wear limited, light or no protective equipment in a role play only if it is safe to do so (for example, a role play in which no physical contact takes place) and should always wear appropriate protective equipment if the scenario may involve hard physical contact or projectiles fired from simulated firearms.
- When it is safe to do so, recruits should wear a street uniform, shoes and a duty belt, with a dummy handgun that does not fire projectiles; recruits should carry simulated handguns that fire projectiles only during force-on-force role plays, after they have been trained in the safe use of the simulated firearms, and when all participants in the role play are wearing proper protective gear, including eye and neck protection
- Instructors should review all safety rules with recruits before each scenario
- Instructors should check each recruit's safety equipment before each scenario
- In some scenarios, instructor role-players should try to disarm the recruits
- Instructor role-players should not use full-force strikes against recruits, and they should use padded surfaces (like gloves) to strike
- Instructor role-players should not use repeated strikes to the recruit's head
- Simulated fights should be videotaped

- Simulation training should not take place before the usual waking time of the recruits
- The goals of the training should be clearly established before each exercise

Safety precautions for simulated fights during scenario training

- One instructor, trained in managing simulations and recognizing injuries, should supervise the fight, and coach the recruit
- At least two additional trained instructors should be present as safety monitors
- The supervising instructor and the safety monitors should stay close to the recruit during the fight (to allow rapid recognition of any potential problem)
- A medical bag, including an AED, should be in the training room
- An EMT should be present in the training room
- Adequate padding should be placed on the floor and on the walls of the training room
- An ALS (advanced life support) ambulance should be able to respond within less than 15 minutes after an injury in the training environment
- Recruits should be evaluated for injuries after the simulations
- Any injured recruit should be evaluated by a physician on the same day
- Any recruit knocked down or disoriented after a strike to the recruit's head should be evaluated by a physician on the same day
- EMS should be called for any of the following reasons:
 - Loss of consciousness
 - Chest pain
 - Shortness of breath
 - Altered mental status
 - If the recruit requests it
 - If any instructor or the EMT requests it

Criteria for stopping simulated fights during exercises

- Instructors will strictly observe all criteria for stopping fights
- Anybody present in the room (including the recruit) is allowed to stop the fight, at any time (using a pre-arranged codeword)
- All participants will stop fighting immediately when the signal to stop is given
- The fight should not last more than one minute, and should always be stopped not more than one minute after it began
- The fight should be stopped immediately:
 - If the recruit has accomplished the goal of the exercise (usually, controlling the role-players), or
 - If the recruit has been knocked down by a strike to the recruit's head, or
 - If a recruit is disoriented after a strike to the recruit's head, or
 - If the recruit is not able to protect himself (and if so he/she should get medical evaluation/treatment and remedial training as needed)

Qualifications of defensive tactics instructors

- Formal certification as police instructor (from TCLEOSE)
- Formal certification as police defensive tactics instructor (from the public or the private sector)
- Formal training in confrontational simulations for selected instructors who will serve as coaches, role players or safety officers during scenario training
- First aid training – Instructors should be encouraged to obtain and maintain an EMT certification
- 80 hours of annual continuing education (possibly less for senior, experienced instructors)
- Annual continuing education should include:
 - One general use of force course (like a trainers' conference)
 - One or two specific use of force courses (like a course on groundfighting)

Other general recommendations to improve defensive tactics training at the TXDPS Academy

- TXDPS should implement a formal injury review process, including:
 - Regular, monthly, reviews of injury reports by the Academy Commander or captain
 - Identification of the most common causes of injuries
 - Proper documentation of injuries (using uniform definitions to describe the injuries, rather than having the instructor's opinion determine whether to call the injury "concussion," or "multiple head trauma," or "contusion to the head")
 - Training for instructors in how to recognize training injuries, and how to describe and document them in a clear, uniform way
- Serious injuries should be investigated by a team with members from the training staff and risk management, as well as a physician, and a high-level supervisor who is assigned outside the Academy
 - Serious injuries include death, permanent disability, hospitalization, and permanent medical separation from the training program
- Realistic, validated training should be implemented
 - Simulated firearms and training, marking rounds should be used
 - Use of force scenarios around cars and traffic stops should be conducted
 - Some scenarios should resolve without any use of force
 - Punching should not be part of the defensive tactics curriculum
- TXDPS should develop a formal way to validate defensive tactics training, and implement changes, using the following tools:
 - Evaluation of students' achievement during simulation training
 - Review of all or selected use of force reports by Academy staff
 - Feedback from Academy graduates
 - Surveys of officers in the field
 - Interviews of officers who have been involved in fights
 - Review of line of duty injury reports

- Networking with other instructors, through publications, conferences, training organizations, and listservers

Note: to help ensure that training is valid and current, the curriculum should be revised at least every two years

- TXDPS should increase the number of defensive tactics instructors by:
 - Hiring more instructors
 - Cross-training existing instructors to teach defensive tactics
 - Instructor-to-student ratio should be 1 to 10 or 1 to 12, during defensive tactics training (excluding simulation training)
- TXDPS should implement a conflict management program, in which students learn to use effective communication to help to prevent physical confrontations: that program should be an integral part of the arrest and control tactics training
- TXDPS should implement a “self defense conditioning” program to supplement the current physical training program

TXDPS Candidate Medical Screening (Pre-placement)

- Modify the HR-28 to expand questions concerning prior head injuries, pregnancy, thyroid condition, and exercise history
- Enhance candidate cardiac screening with the addition of lipids, glucose, and resting ECG
- Perform a cardiac risk assessment for all candidates

TXDPS Academy Recruit Medical Screening

- Develop guidelines for blood pressure levels that restrict physical and defensive tactics training for high blood pressure (160 mm Hg or greater systolic and/or 100 mm Hg or greater diastolic)
- Document screening of recruits prior to Survival and Control Tactics training

TXDPS Academy Injuries and Return to Training Medical Procedures

- The TXDPS should consistently use the HR-87 form for all Academy recruits seeking to return to training after an illness or injury
- Develop the position of TXDPS occupational medicine physician

Introduction

This evaluation was performed in response to the request from the Texas Department of Public Safety (TXDPS) to conduct a study of the Active Countermeasures Training program utilized by the Department to train Trooper-Trainees in the Training Academy tactics and advise the agency on new or alternative training programs, methodologies, techniques, equipment or other related factors that could improve and/or enhance the safety and overall effectiveness of the program.

On January 10-12, 2006, we (Dr. Fabrice Czarnecki and Dr. Richard Miller) made a site visit to TXDPS headquarters in Austin, Texas. The initial meeting with senior TXDPS management included the following:

Thomas A. Davis, Jr. Director
David McEathron, Assistant Director
Mary Ann Courter, General Counsel
Burton Christian, Chief, Administration Division

TXDPS senior management provided the following guidance for this evaluation:

- The evaluation was to be an in-depth analysis, frank and objective, and independent
- We were to look at the Active Countermeasures and full contact training, applicant screening, and Physical Training leading up to Defensive Tactics and full contact training
- We were to validate the effectiveness and necessity of the Active Countermeasures training
- We were to make recommendations for increasing the safety of the Active Countermeasures training.

During this site visit, we also interviewed a number of other TXDPS personnel (see Attachment 1), and obtained access number of documents and videos which we reviewed (see Attachment 2).

I. TXDPS Candidate Medical Screening (Pre-placement)

Candidates for the TXDPS are medically screening with a recently enhanced medical history questionnaire (HR-28). The HR-28 form is used by TXDPS Human Resources to determine the need for specialty referral prior to the candidate's general medical exam by St. David's Occupational Health Services. Based on the candidate's responses to the HR-28, the TXDPS Human Resources directs the candidate to specialty evaluation after a conditional offer of employment has been made. Specialty evaluation is generally for cardiology, neurology, and orthopedic consultations. For example, if a candidate responds "yes" to medical history questions 13-18 (neurology) or daily headaches, TXDPS Human Resources will refer the candidate to a neurologist.

The TXDPS currently pays for all orthopedic evaluations for candidates. The TXDPS Human Resources refers about 50% of all candidates for an orthopedic evaluation (in the last three schools it was 57%, 35%, and 18% respectively). About six or seven candidates per class of 125 recruits are referred for cardiology consultation, mostly due to murmurs picked up during the St. David's medical exam. The Director, TXDPS, makes the final hiring determination for all candidates.

The TXDPS knows of no heart conditions developing in recruits during Academy training. No diabetes has been discovered in Academy students or officers that was not previously known during the candidate medical screening. The TXDPS Human Resources acknowledges that enhancement of cardiac risk assessment is desired as some candidates are greater than 50 years of age. There are seven or eight recruits per class over 40 years of age. Until 1991, there was an age limit of 36 for candidates.

Currently, TXDPS Human Resources reviews the specialty medical reports that they have requested, forwarding these to the occupational medicine physician at St. David's to include in the candidate's final medical qualification determination. Human Resources is planning to localize and centralize their medical specialists, educate them about the recruits' training and the officers' job requirements, and reduce the use of more remotely located specialists. TXDPS is also planning to pay for all specialty candidate medical evaluations.

St. David's Occupational Health Services

Brent Davis, MD

Joy Stewart-James, Director

Jolene Shriner, Clinical Operations Supervisor

Physicians at St. David's are performing the candidate medical clearance for the TXDPS. Medical staff at St. David's have spent time at the Academy to develop understanding of recruit training, especially Active Countermeasures. Medical standards for candidates were provided to the medical staff of St. David's.

As a part of the candidate's medical exam, additional cardiac risk screening (fasting blood sugar, blood cholesterol and triglycerides, and resting ECG) has been

recommended to the TXDPS by St. David's. St. David's has recommended these tests based on the need for vigorous exercise clearance, especially with older candidates. On occasion, St. David's may not be aware of parallel orthopedic or other specialist referrals requested by TXDPS Human Resources.

Strengths

- The TXDPS Human Resources does a thorough job in screening for candidate medical issues, using its newly revised HR-28 medical history questionnaire
- The TXDPS Human Resources facilitates cardiac, neurologic, and orthopedic evaluations of candidates to ensure comprehensive specialty evaluations for candidates
- Candidates with a history of any previous neurological condition get an evaluation by a neurologist

Areas for Improvement

- The HR-28, question #14, asks about "concussion," which may be a poorly understood term, and, therefore, may not get the desired responses (a prior head injury may not be considered a concussion)
- There is a limited cardiac risk assessment of candidates prior to starting vigorous training at the Academy. With some candidates over 50 years of age, a more thorough cardiac risk evaluation should be done
- The HR-28 does not ask for information concerning current pregnancy, headaches, thyroid condition, bleeding tendency, or physical exercise activity, all relevant to safe training and job performance as a commissioned officer
- The occupational medicine physician(s) at St. David's may not be fully utilized as the medical consultant for TXDPS Human Resources, such as in the selection and training of medical specialists, and education about the requirements of the Academy training, of the TXDPS commissioned officer's job
- TXDPS should ensure that all medical specialists understand the requirements of the Academy training, and of the TXDPS commissioned officer's job

Recommendations

The HR-28, question #14, asks about concussion, which may be a poorly understood term. This question should be expanded to include all prior head, face or neck injuries.

- Information concerning dates, type and location of injury, treatment, etc., should be sought.
- TXDPS should add questions to the HR-28 concerning "current pregnancy," headaches (frequency, duration, and severity), history of thyroid condition, and typical exercise/physical activity (type, frequency, duration, and how long performed).

- TXDPS should change question #12 in the HR-28 to “Other blood disorder or bleeding tendency.”
- TXDPS Human Resources should develop the position of TXDPS occupational medicine physician. See Attachment 8, “The Role of a Law Enforcement Agency Occupational Medicine Physician.”

In conjunction with the TXDPS, this physician should do the following:

- Be educated as to the Academy training and the TXDPS commissioned officer job requirements
- Provide TXDPS with the medical recommendations of candidates
- Assist TXDPS in the selection and education of cardiology, neurology, and orthopedic consultants
- Educate neurology consultants to better understand the type of Academy training used (Survival and Control Tactics) and develop uniform evaluation criteria for candidates to ensure that recruits are not at increased risk for serious head injury during training

TXDPS Human Resources should enhance the current cardiac screening of candidates. See Attachment 9 for a detailed explanation of these recommendations. These recommendations include:

- Modifying the HR-28 form to obtain a comprehensive cardiovascular history (see Attachment 9 for recommendations)
 - All candidates should receive a fasting total cholesterol, LDL cholesterol, HDL cholesterol, triglycerides, and fasting blood sugar
 - All candidates should receive a resting ECG
 - All candidates defined as “High Risk” (see Attachment 9) should be referred to a cardiologist for vigorous exercise clearance
 - Candidates defined as “Moderate Risk” (see Attachment 9) should be assessed by the occupational medicine physician for cardiac, pulmonary, and metabolic disease/risk factors and provide recommendations to the TXDPS concerning performing a chest x-ray or a cardiology, pulmonary, or endocrinology (diabetes and thyroid) referral

II. TXDPS Academy Recruit Medical Screening

There are about five weeks between the medical clearance for candidates (by St. David's) and their entering the TXDPS Academy. Recruits provide updated medical information at many times during Academy training, including the following:

Recruits are asked if any change has occurred since candidate medical clearance (Use of Force Training Information Sheet and Medical Evaluation for Defensive Tactics Training Sheet), which includes pregnancy

Recruits are asked to log their medications at the beginning and during training

Recruits have blood pressure assessments at Academy entry and every 6 weeks by Physical Training staff

Recruits provide an updated medical history review prior to OC spraying, using the "Medical Evaluation for Defensive Tactics Training" sheet. This evaluation by Defensive Tactics staff includes blood pressure and pulse.

There are no documented guidelines for blood pressure screening and the training impact of high blood pressure at the Academy. There is no documented physical assessment of recruits prior to Survival and Control Tactics training.

Strengths

- The TXDPS Academy, on many occasions, reviews and updates the medical history and blood pressure of recruits during their training

Areas for Improvement

- Forms used at the Academy to document past medical history do not specifically request information concerning head injuries or neurological conditions (headaches, dizziness, impaired vision, memory loss, numbness in body part, nose injury, shoulder injury, etc.), which may impact on the risk for serious head injury or their ability to perform in a bout
- There are no documented guidelines for blood pressure screening at the Academy
- There are no established blood pressure cutoffs for physical and defensive tactics training
- There is no physical assessment of recruits immediately prior to Survival and Control Tactics training

Recommendations

The TXDPS Academy should develop guidelines for blood pressure levels that restrict physical and defensive tactics training.

It is recommended that consistent (two or more measurements ten minutes apart) Stage 2 high blood pressure (160 mm Hg or greater systolic and/or 100 mm Hg or greater diastolic) should prohibit physical and defensive tactics training until a)

blood pressure has been treated and a physician's statement has been provided stating that neither the blood pressure or its treatment (medications) will limit vigorous exercise training and/or b) reduction of blood pressure below 160/100. See Attachment 10 for the basis of this recommendation.

Forms should be developed and used by the Academy immediately prior to Survival and Control Tactics training to document past medical history concerning head injuries or neurological conditions (headaches, dizziness, impaired vision, memory loss, numbness in body part, nose injury, shoulder injury, [etc.],) which may impact on the risk for head injury or their ability to perform in a bout.

This information should include date and type of head, face or neck injury. Any positive response, unknown at the time of the candidate medical exam, should require medical clearance for training.

III. TXDPS Academy Injuries and Return to Training Medical Procedures

There is a paramedic unit with the Austin EMS across the street from the Academy, 100 yards away, ready to respond to Academy injuries. Less serious Academy injuries are handled by the instructor staff, who are trained as EMT's or First Aid Instructors, also known as "safety officer." Safety officers assist the Academy instructors in supervising recruit training to increase the safety of the training and to provide assessment of training injuries.

There is a sick and injury call out before, during and after physical training sessions. Academy instructor staff review recruit injuries and illnesses and encourage recruits to fill out the Texas State Office of Risk Management "Employer's First Report of Injury or Illness" forms (TWCC-1S). Significant injuries and illness for recruits are medically evaluated by Pro Med or a self-selected physician through the Texas workers' compensation program.

Under the Texas Workers' Compensation System, Texas state employees have the right to their initial choice of physician. Although under Texas state law work-related illness and injuries must be reported to their employer within 30 days of illness/injury, due to the safety-sensitive nature of their work, employees of TXDPS must immediately report work-related injuries to their supervisor.

The TXDPS HR-87, "Evaluative Medical Status Report," is a request by TXDPS to the health care provider for a medical return to duty (training) determination. The HR-87 provides the physician with TXDPS job duties and asks the physician to determine if the employee can or cannot return to full duty with or without limitations. It appears from a review of TXDPS Academy head injury cases (see Attachment 3), that until about May 2004, this form was not consistently used, resulting in some inconsistent and incomplete return to training medical determinations.

The physical training (PT) program has worked to reduce Academy recruit injuries. For example, since instructors found that lunges can cause hamstring and gluteal soreness, lunges are done on Friday to allow weekend time for recovery. This type of training is important as it enhances the ability to get up from the ground. Injury patterns in PT have included hamstring and quadriceps muscle strain, shin splints, and plantar fasciitis. Injuries in PT have been markedly reduced with only one case of shin splints in the last training class.

Running injuries (code # 60) were said to be mostly defensive tactics-related. An example mentioned was a hamstring pull with kicking the front part of the foot to the bag. The PT program has reduced shin splints by allowing natural strides with running, i.e., by reducing formation running and by sprinting after warm-up and stretching. The Academy uses a modified Cooper Institute PT program; while the Cooper program is geared to the individual, modifications have been made to fit the Academy's large recruit class.

Additional methods have been used to prevent injuries, including:

- Use of the Wet Bulb—temperature/humidity assessment for safe outdoor training
- Prohibiting caffeine use prior to PT and prohibiting all caffeine consumption until after the 17th week of training
- Making ample fluids available to prevent heat injuries

Paul Carrozza with a private company, Run Tex, has been to the Academy and has evaluated all recruits for proper athletic shoes, further reducing running injuries.

Jay Sams has been the TXDPS Risk Manager, Human Resources for the past six years. He monitors illness and injury at the Academy and throughout TXDPS to reduce employee health and safety risks. He is associated with the ASSE (American Society of Safety Engineers). He tracks TXDPS illness and injuries and then reports this data to the Texas State Office of Risk Management, by entering the data into the State database. In turn, he receives monthly reports from the Texas State Office of Risk Management.

Mr. Sams provided us with multiple reports and documents concerning student injuries and illness, including the medical files of Academy head injuries occurring during the past two years. Based on these medical chart reviews, it was determined that five serious head injuries occurred during Survival and Control Tactics training from 12/16/03 until 5/19/05 (see Attachment 3). The report, “Cause of Injuries by Year,” 1996 to 2005, showed a total of 392 injuries from Active Countermeasures training (code # 74—Active Countermeasures). Prior to 2003, two students were hospitalized with concussions (nine days each) in 1999 and one student (three days) in 2001.

From FY 1996—2005, the following **compensable head injuries** (under workers’ compensation) occurred in Active Countermeasures, a total of 57 head injuries. This does not include eye, ear or other non-concussion facial injuries.

1996	5 injuries (1 concussion, 3 contusions, 1 laceration)
1997	3 injuries (3 contusions)
1998	4 injuries (2 concussions, 2 contusions)
1999	11 injuries (7 concussions, 4 contusions)
2000	5 injuries (3 concussions, 1 contusion, 1 sprain)
2001	4 injuries (4 concussions)
2002	1 injury (1 concussion)
2003	6 injuries (6 concussions)
2004	13 injuries (11 concussions , 2 contusions)
2005	5 injuries (1 concussion, 3 contusions, 1 laceration)

Pro Med Medical Care Center evaluates TXDPS Academy injuries. Dr. Casey Cochran is the Director of Occupational Medicine. He has observed Academy training and is comfortable with his understanding of the TXDPS training requirements. He stated that Academy injuries seen include running sprains and fractures from falls. He

will generally order CT scans with head injuries. He uses the Colorado Medical Society guidelines for return to contact sports (training) following a concussion (head injury).

Dr. Leocadio Valentin, internal medicine physician at Pro Med, has not observed training of TXDPS Academy recruits. He stated that recruits always want to return to training as soon as possible, and that translating his medical restrictions into training restriction recommendations to the TXDPS can sometimes be difficult.

Strengths

- The TXDPS Academy is proactive in encouraging recruits to report injuries and illness
- The PT program has worked to reduce training injuries
- The TXDPS uses the HR-87 form, a Texas State form providing a standardized return to training medical determination
- Dr. Cochran, Director of Occupational Medicine at Pro Med, has been educated as to the requirements of Academy training and is comfortable with making return to training determinations

Areas for Improvement

- A large number of compensable head injuries, many of them serious, occur during Survival and Control Tactics training
- Until about May 2004, the HR-87 form was not consistently used, resulting in some inconsistent and inadequate return to training medical determinations

Recommendations

The TXDPS should consistently use the HR-87 form for all Academy recruits seeking to return to training after an illness or injury

The TXDPS Human Resources should develop the position of TXDPS occupational medicine physician. (See Attachment 8, "The Role of a Law Enforcement Agency Occupational Medicine Physician.")

In conjunction with the TXDPS, this physician should:

- Assist TXDPS in Academy return to training medical determinations
- Assist in educating other physicians (specialists) providing return to training medical determinations as to the requirements of TXDPS Academy training
- Assist the TXDPS Risk Manager in reviewing health and safety issues concerning enhancement of training and employee safety

IV. TXDPS Academy Training Program—Overview

The TXDPS Academy leadership includes the Academy Commander, captain, and three lieutenants. The Academy Commander and the lieutenants are all graduates of the FBI National Academy. The captain is a graduate of the Northwestern University Traffic Institute School of Police Command and Staff. Other full-time instructors are sergeants. Including the Academy leadership, the training staff is made up of 15 full-time instructors, all commissioned officers. Full-time instructors are all certified as law enforcement instructors by TCLEOSE (Texas Commission on Law Enforcement Officer Standards and Education). Full-time instructors are supplemented by part-time instructors and counselors. Counselors are regular troopers who help with basic training. The TXDPS has a Training Committee with one member of each TXDPS Division, which continually reviews the training curriculum.

Full-time instructors are all Red Cross-certified first aid instructors. Three instructors are EMT's, and two are former EMT's.

The TXDPS Academy provides a 27-week basic training program for recruits. The Academy also hosts in-service training for TXDPS commissioned officers (40 hours every two years), and specialized training sessions for local law enforcement agencies. In 2005, there were 49 such sessions at the Academy.

TCLEOSE requires a total of 618 hours of mandated courses in recruit training. The TXDPS Academy basic training program exceeds 1,200 hours.

The Academy has hosted one to four classes every year in each of the past seven years. Each class had an enrollment ranging from 93 to 158 recruits. Between September 1999 (beginning of A-99 Recruit School) and August 2005 (end of A-05 Recruit School), a total of 1,608 students entered the Academy, and 1,315 graduated. 293 students “dropped out” (average of 22.5 students/class or 18.22%). The main reasons for “dropping out”, according to Academy staff, were reduced mental attitude and preparedness (homesick, don't like the structured environment, etc.) or not being prepared for the Academy's intense physical training.

V. TXDPS Academy Physical Training

The physical training (PT) program begins in the first week of training. PT builds leg and arm strength, grip strength with finger pushups and resistance bands. The initial fitness evaluation is based on the 1.5 mile run. Three groupings of recruits are made based on speed and reassessed every six weeks. Recruits are assessed based on blood pressure, weight, body fat percentage, pushups, sit-ups, and a 1.5 mile run every six weeks.

The PT progresses with a warm-up, flexibility, stretching, and then a 1.5 mile run at 5:45-6:30 AM. The PT program includes chin-ups, dips, pull-ups, running, 40 push-ups, and 25 sit-ups. Recruits use resistance bands for upper body strength. Static and ballistic stretching is used.

Tactical PT is a scenario-based training that involves defensive tactics skills, endurance and use of force decision-making.

The goals of the PT program are:

- Building strength for firearms and defensive tactics
- Enabling recruits to meet or exceed job-related fitness standards
- Enabling recruits to run 1.5 miles in 12 minutes
- Improving recruit performance on fitness measurements held every 6 weeks
- Reducing injuries during the defensive tactics program
- Motivating individuals to maintain fitness after graduation

Strengths

- Firearms and defensive tactics provide feedback to PT instructors.
- A fitness assessment is performed every six weeks. It monitors the progression of the recruits, and also measures the outcome of the PT program.
- TXDPS improves the physical fitness of the recruits, which could lead to fewer injuries during defensive tactics. An unpublished study from the Federal Law Enforcement Training Center (R. Tobias, FLETC physical fitness coordinator, personal communication, February 2006) showed a correlation between level of physical fitness and injuries during defensive tactics training.
- Tactical PT centers on practical applications, with no distinction between defensive tactics and cardiovascular training.

Areas for Improvement

The PT program focuses on calisthenics and cardiovascular training. Calisthenics are good endurance training, but resistance training, such as weight training and plyometrics, which are more useful for self defense, should also be used.

Recommendations

TXDPS should implement a “self defense conditioning” program to supplement the current physical training program.

Running and calisthenics should be used to bring recruits to an appropriate baseline level of fitness, and then resistance training (weight training and plyometrics) should be added.

PT instructors should be cross-trained in defensive tactics.

A self defense conditioning program should include the following elements:

Plyometrics (development of an explosive force), using jumps and medicine balls.

Plyometrics is the PT element closest to actual self defense.

Workout using multiple heavy bags. A recruit could hit three bags arranged in a triangle.

Grip strength, which helps with defensive tactics and with firearms accuracy, using Iron Palm bags and spring-loaded grippers. (An Iron Palm bag is an octagonal bag, made of canvas, and filled with steel shot.)

Vision training, to increase attention and usable field of vision, using medicine balls, Iron Palm bags, and light objects thrown at recruits.

Balance and proprioception training, using air pillows, wobble boards, and medicine balls.

Flexibility training.

VI. TXDPS Academy Defensive Tactics Training

VI. A. Overview

The TXDPS defensive tactics training program, called Arrest and Control Tactics, is made of the following elements:

- Verbal communications
- Empty-hand control
- Stunning techniques
- Handcuffing
- OC spray
- Baton
- Survival and Control Tactics

The Survival and Control Tactics is the simulation part of the defensive tactics training. It is made of two elements:

- Grappling (role playing)
- Force-on-Force (full force exercise)

While TCLOSE mandates a minimum of 40 hours, the TXDPS Training Academy standards provide 100 hours of defensive tactics training.

TXDPS currently employs two defensive tactics instructors for the Academy. They are extremely qualified martial artists with practical law enforcement experience, and are certified as law enforcement instructors by TCLEOSE.

While some Academy instructors have attended outside training (including training from Blauer Tactical Systems, Controlled Force, Krav Maga, and PPCT Management Systems), there are no requirements or certifications to teach defensive tactics beyond the TCLEOSE instructor development program. The TCLEOSE program is a classroom-only generalist training program, and is not specifically a defensive tactics instructor's course. TXDPS brings in outside speakers and trainers during an annual, week-long, seminar for defensive tactics instructors

Some of the principles stated in the Arrest and Control Tactics program are:

- Commonality of movement: There is a similar motion to draw a handgun, a baton or a can of OC spray
- Focus on disengagement
- Awareness of weapons
- Awareness of multiple assailants
- Awareness that many fights end up on the ground
- Simple movements that are easy to retain in the long-term
- Importance of safety in training

Areas for Improvement

In a typical defensive tactics class, a class of 100 to 140 recruits would be in a gym with one to three instructors and three to four counselors. Instructors are not required to complete a defensive tactics instructor's course. There is no systematic continuing education policy for TXDPS defensive tactics instructors.

Recommendations: Number of defensive tactics instructors

Police academies that we surveyed had an instructor-to-student ratio of 1 to 10 or 1 to 12 (excluding simulation training, which requires more instructors per student). Defensive tactics schools in the private sector, in our survey, had an instructor-to-student ratio of 1 to 4 or 1 to 6 (excluding simulation training). TXDPS should increase the number of defensive tactics instructors by:

- Hiring more instructors
- Cross-training existing instructors to teach defensive tactics
- Instructor-to-student ratio should be 1 to 10 or 1 to 12, during defensive tactics training (excluding simulation training, which requires more instructors per student)

Recommendations: Qualifications of defensive tactics instructors

- Formal certification as a police instructor (from TCLEOSE)
- Formal certification as a police defensive tactics instructor (from a the public sector or private sector academy or school)
- Formal training in confrontational simulations for selected instructors who will serve as coaches, role players or safety officers during scenario training
- First aid training – Instructors should be encouraged to obtain and maintain an EMT certification
- 80 hours of annual continuing education (possibly less for senior, experienced instructors)
- Annual continuing education should include:
 - One general use of force course (like a trainers' conference)
 - One or two specific use of force courses (like a course on groundfighting)

VI. B. Survival and Control Tactics Training

Prior to 1988, TXDPS had a boxing program. The protective equipment was limited to head protection, hand wraps, groin cup, mouthpiece and boxing gloves. In 1988, it was decided to discontinue the boxing program, “due to boxing not being realistic control tactic and injuries sustained in matches” (according to the Arrest and Control Tactics Program Time Line document, page1).

In 1988, two TXDPS instructors trained with Gary Klugiewicz, and adopted his Active Countermeasures system. Boxing gloves were re-introduced in 1994. In 1998, the original Active Countermeasures program was suspended, and the Academy went back to a boxing-based simulation program. Grappling was added in 2002.

Two Survival and Control Tactics sessions are offered, at the tenth and twelfth weeks. Some recruits may have to go through a third session if they did not complete the previous sessions.

A Survival and Control Tactics program starts at 4:30 AM, which is earlier than the usual waking time of the recruits, and usually ends before 7:00 AM. Recruits start with stretching and warm-up, and are then paired by size and weight for the next two drills (grappling and force-on-force). The Survival and Control Tactics is performed on a mat, surrounded by recruits holding striking pads, to contain the fighters.

The **grappling** exercise is a weapon-retention wrestling match. It lasts for two minutes, and is repeated four times. It is a groundfighting exercise, and recruits are not supposed to stand up. Recruits are not allowed to use any strike, as the protective equipment is limited to mouthguards and athletic cups. Recruits can use wrestling, pressure points, weapon retention techniques, neck restraint and arm bar takedown. To reduce injuries, training weapons are taped and their sights are filed down. According to the Arrest and Control Tactics Program Time Line document (page 3), “Grappling was done before the stand up matches based on the fatigue factor which reduces the punching and kicking power.”

The **force-on-force** exercise is a stand-up, “toe-to-toe” fight where recruits strike each other. It lasts for 30 seconds, and is repeated six times. The protective equipment includes headgear, belt/cup protectors, forearm protectors, shin protectors, chest protectors, boxing gloves (18 oz.), knee pads, mouthguards and athletic cups. The techniques used by the recruits are mostly punches, with occasional kicks. Recruits are not allowed to strike unprotected areas. Groundfighting is not allowed.

The TXDPS DT Manual (Survival and Control Tactics Role-play) states (pages 20-22):

- “Self-control: The participant must not execute tactics in a wild manner; he/she shall not lose emotional control or use offensive language. The student must evaluate the tactics executed and defensive tactics must be controlled. The

student will cease to fight when commanded by the referee or decrease the power of the strikes when commanded.”

- “Strikes to the head should be done with control and at moderate force (Emphasis on control of execution)”
- “No strikes to the side or back of the head. Impact should be on the protected area only”
- “No strikes to the throat area”
- “Strikes should be controlled/referee is responsible for controlling the SCTR [Survival and Control Tactics Role-play]”

Further, TXDPS supervisors stated:

- If a participant is not able to defend against head strikes, the other recruit is ordered to strike the participant only in the abdominal area
- If a participant is warned and repeats a violation, corrective action is taken against the violator, for instance, the violator may be instructed to perform 20 push-ups as a penalty

There are usually two fights going on at same time, with only one safety officer monitoring both fights. Each fight is supervised by an instructor, who is present on the mat. The safety officer is located outside of the circle made by the recruits around the mat.

After each 30 second round, the recruits are sent back to their respective corners where they are evaluated for injuries, and have their protective equipment adjusted as necessary. An instructor checks for pupil dilation after each “significant” injury. Every recruit is verbally assessed after the bouts.

The criteria stated for stopping a fight were:

- Subjective assessment (based on first aid training) as to alertness
- Level of consciousness
- Pupil reactivity,
- Awareness of surroundings
- Blurred vision,
- Ringing in ears
- Headache.

If there is decreased alertness after a knockdown, the fight is stopped and EMS is called. If a hit results in a loss of consciousness and the recruit is unresponsive, the fight will be stopped and EMS called. The recruit will go to the doctor for further evaluation.

Areas for Improvement

- The safety officer does not have a clear view of each fight.
- A lone instructor on the mat may not be aware of all the strikes or potential injuries.
- There is no checklist or procedure for what type of injuries to assess, or what to look for in assessing them
- There is no documentation of any injury assessments performed
- The assessments of the instructor are subjective and not standardized
- There is no protocol for stopping fights with head strikes or knockdowns.
- In reviewed videos, recruits were rarely following the rules of not hitting unprotected areas (especially the head)
- Full-force strikes to the unprotected areas (sides, back, top) of the head were common, and rarely or never stopped by the instructors

The main reasons stated by TXDPS for the Survival and Control Tactics program were to allow recruits to experience being hit, and to have recruits learn to fight beyond their point of exhaustion. TXDPS felt that these skills were important given the job requirements TXDPS, where troopers may patrol a rural county in a one-officer car, with the nearest back-up possibly two hours away. TXDPS felt that recruits' training should be realistic to help ensure officers' survival. TXDPS also felt that law enforcement officers who do not receive confrontational training will tend to over-react or not defend themselves when confronted.

Areas for Improvement

- While the Survival and Control Tactics program might improve recruits' defensive mindset, and provide some physical skills useful in succeeding in a confrontation, these benefits are outweighed by the risks of head trauma, concussion, loss of job and death. Other training methods which are more realistic, more effective, and safer should be used instead.

Recommendations

- Punching should not be part of the defensive tactics curriculum (see Attachment 4)

VI. C. Protective Equipment

Equipment currently used by TXDPS

During the force-on-force exercise of the Survival and Control Tactics program, recruits wear the following protective equipment:

- Headgear: “Cobra-StarFace”, made by Kim Pacific Corporation
- Belt/cup protector: made by Ringside
- Forearm protector: made by Red Man
- Shin protector: made by Ringside
- Boxing gloves (18 oz): made by Ringside
- Chest protector: made by Ringside
- Knee pads
- Athletic cup
- Mouthguard

According to Kim Pacific Corporation “Any head gear will provide some added protection but cannot guarantee protection against impact. Obviously this head gear [Cobra-StarFace] is designed to protect the nose area but the force will be transferred to other parts of the head area.” There is no instructions manual for the StarFace.

Limitations

While no training suit could provide complete and reliable protection during full-force training, we recommend that instructors wear a full protective suit (see below). Especially concerning are blows to the head, throat, neck, and forced motions of the neck (like hyperextension).

Another issue is the protection of the students. Instructors (role players) wear full protective suits during simulations, but the protection of students depends on the Academy. At the Florida Highway Patrol Academy, recruits wear Fist helmets and body armor. At the Federal Law Enforcement Training Center, recruits wear headgear, chest protectors, grappling gloves and groin protectors. At Modern Warrior Police Defensive Tactics, students do not wear any protective equipment, since Modern Warrior believes that it could give them a false sense of confidence, and that they might allow themselves to get hit more easily. On balance however, it is safer for students to wear some protective gear during simulations, and our specific recommendations are below.

Recommendations

- TXDPS’ instructor role-players should use RedMan or Fist protective suits during simulation training, since these suits are already on hand, and available.
- TXDPS’ recruits should wear protective headgear (from RedMan or Fist suits), body armor or chest protectors, grappling gloves and groin protection, during simulation training.

- The protective equipment should be certified by the manufacturer for the use that TXDPS is employing it, and used in accordance with manufacturer's guidelines.
- Only role-players who are trained instructors should engage in physical contact with students, or fire projectiles from simulated firearms at students, during confrontational simulations.
- Students should never engage in physical contact with other students during simulations.
- Instructor role-players should be trained in confrontational simulations.
- Instructor role-players should use an appropriate protective suit.
- Role-players should be trained in the use of the issued protective equipment, and show proficiency in its use. Typically, they should complete an obstacle course, while wearing the full protective suit.
- Instructor role-players should not use full-force strikes, and they should use padded surfaces (like gloves) to strike.
- Instructor role-players should not use repeated strikes to the head.
- Instructor role-players should use an appropriate protective suit.
- The type of training should dictate the type of protective equipment that recruits wear; recruits may wear limited, light or no protective equipment in a role play only if it is safe to do so (for example, a role play in which no physical contact takes place) and should always wear appropriate protective equipment if the scenario may involve hard physical contact or projectiles fired from simulated firearms.

VII. Review of Selected Police Defensive Tactics Training Organizations

Federal Law Enforcement Training Center (FLETC)

FLETC is currently training 51,000 students annually in basic programs, for 85 federal agencies. FLETC is currently employing 68 defensive tactics instructors. During defensive tactics training, the instructor to student ratio is 1 to 12. There are at least two defensive tactics instructors in each training room.

Principles of defensive tactics training:

- Do not stand-up toe-to-toe
- Disengage and create distance, after the initial two or three strikes
- Escalate the use of force by transitioning to a weapon
- Stress inoculation; start simulation early in the training program
- “Bad guys don’t box.”
- Self defense against violent suspects is not a boxing match, since suspects do not observe the rules of boxing
- Do not base training on failure

Validation of the defensive tactics program:

- Annual continuous validation survey, sent to the agencies trained by FLETC
- Curriculum review conference, every two years
- Feedback from the field
- Feedback from temporary instructors
- Known criminals’ tactics
- Fights captured on videotape
- Identification of common problems:
 - Officers get toe-to-toe, instead of using an weapon
 - Officers are distracted and attacked by several suspects and thrown to the ground
- Multiple and frequent sources of outside training from the private sector
- New techniques are tested by instructors in confrontational simulations
- Is the average person able to do each technique?

Defensive tactics instructor’s training:

- Instructor’s development course: two weeks
- First aid training
- Defensive tactics instructor’s course (including sports medicine): three weeks
- “Field training” as assistant instructor: eight to twelve months

Simulation exercises (Tactical Simulation Training):

- Students should learn to strike objects (bags or pads), before hitting the instructors in the protective suit
- Students confront instructors (not other students)
- Simulation exercises can last up to three minutes
- Some scenarios can involve the use of the baton or OC spray
- Some scenarios can involve two assailants
- Several safety officers are present

- Students' protective gear include headgear, chest protector, grappling gloves, groin protector
- Instructor role-players use RedMan or Fist suits for scenarios involving a baton, and High Gear for groundfighting
- Recruits are instructed to use 70% of maximum physical force
- Anybody present in the room (including the recruits) is allowed to stop the fight, at any time
- A typical Tactical Simulation Training exercise would involve the following elements:
 - Calisthenics (between each simulation)
 - A baton scenario
 - One or two groundfighting scenarios
 - Hitting multiple bags
 - Handcuffing (at the end)

Medical support:

Every instructor is trained in first aid
On-site health unit, with physician

Boxing-based training:

Two cases of subdural hematoma (bleeding around the brain) happened in 1995 and 2002, both during boxing training at the U.S. Border Patrol Academy at FLETC.

A FLETC Training Accident Investigation Team (TAIT) presented a report concerning the 2002 U.S. Border Patrol (USBP) boxing head injury: A USBP recruit received repeated blows to the head, which resulted in a subdural hematoma with permanent neurological injury. Recommendation #5 of this report stated:

“The TAIT recommends that the USBP Academy adopt a ‘one knockdown’ rule in all the boxing sparring sessions. The ‘one knockdown’ rule would end a boxing sparring session following a trainee being knocked down or becoming disoriented following a blow or blows to the head. Following the knockdown, the USBP training staff should immediately refer the trainee to the FLETC Medical Unit for evaluation.”

This report supported the above recommendation based on the following:

“When a trainee is knocked down due to a blow to the head, some type of trauma has occurred to the brain. Although this trauma may be insignificant, it could manifest itself into something more serious through further contact in the boxing sparring session. The TAIT believes that when trauma of any kind occurs to the brain, the USBP should take every precaution to ensure the well being of the trainee. A ‘one knockdown’ rule would eliminate any guessing on the part of the USBP staff on how much longer to continue a boxing sparring session.”

The U.S. Border Patrol discontinued their boxing program after that TAIT. Boxing is not part of any current training programs at FLETC.

Florida Highway Patrol Academy

The Florida Highway Patrol (FHP) Academy trains 130 to 140 recruits annually. The duration of basic training is 30 weeks, including 80 hours of defensive tactics. Eleven full-time instructors work at the FHP Academy. Six instructors are certified in defensive tactics (one of them is a civilian). During defensive tactics training, the instructor to student ratio is 1 to 10.

Validation of the defensive tactics program:

- Review of all the FHP use of force reports by Academy instructors
- Joint training with defensive tactics instructors of local law enforcement agencies
- State certification every 4 years
- The Florida Department of Public Safety and the Attorney General's Office conduct unscheduled inspections of the Academy

Simulation exercises (beyond the 80 hours of defensive tactics):

- "Back-to-back": 2 minutes of wrestling on the ground, interrupted every 10-15 seconds; four instructors supervise the exercise
- Force-on-force scenarios where the instructor wears a Fist suit, and the recruit wears a Fist helmet and body armor; no strikes at allowed to the head, neck, throat and groin; four instructors supervise the exercise
- Traffic stop scenarios, without any protective equipment (except body armor)
- Scenarios are performed with opponents of different sizes (who switch frequently)
- No "full-force" training is allowed
- Immediate critique after each scenario

Boxing-based training:

- Boxing was stopped in 1983, because of injuries (concussions and fractures), and lawsuits. We were told that the current simulation exercises provided the same benefits as boxing (handling stress and experiencing the fight).

New Jersey State Police Academy

The New Jersey State Police Academy (NJSP) trains 220 to 250 recruits annually. The duration of basic training is 25 weeks, including 49 hours of defensive tactics (not including baton, OC spray and Verbal Judo). Twenty-eight full-time instructors work at the NJSP Academy. Four instructors are certified in defensive tactics.

Validation of the defensive tactics program:

- Feedback from officers in the field
- Analysis of use of force reports
- Determination of common criminal assaults on officers

Boxing-based training:

- A boxing ring is used
- One instructor inside the ring
- Two or three instructors are watching the fight from outside the ring
- A registered nurse is usually present, and assesses anybody who is “knocked down”
- Any instructor can stop the fight
- Boxing exercise lasts for up to 2 minutes
- Instructors attend formal training on boxing injury prevention
- Recruits wear headgear and boxing gloves
- Hits to the back of the head, kicks and elbow strikes are forbidden
- The emphasis is on techniques and emotional control, not physical force
- Criteria to stop a fight temporarily (recruits are assessed, and fight can be resumed):
 - Hands are down
 - A recruit is not moving or not responding well
 - Knockdown
- Criteria to end a fight:
 - Injury
 - Two knock downs
 - Poor technique displayed by a recruit (who is then sent to remedial training)
- Injuries from boxing, in the past 2 years, out of 400 recruits:
 - One subdural hematoma, leading to permanent medical separation
 - Three to four concussions, not requiring hospitalization
 - One broken nose

U.S. Secret Service Academy

The U.S. Secret Service Academy trains approximately 500 recruits annually, special agents and Uniformed Division officers, over a period of 12 weeks (after initial training at FLETC).

Validation of the defensive tactics program:

- Each technique is evaluated based on these criteria:
 - Is the technique perishable?
 - Is the technique too difficult to achieve?
 - What is the risk of injury in training?
- Regular meeting with agents in the field and local law enforcement
- Joint training with local law enforcement
- Outside training, from the private sector, for senior instructors
- In-house certification for defensive tactics instructors

Simulation exercises:

- Students confront instructors (not other students)
- Simulation exercises can last for up to one minute
- RedMan suits are used
- One or two safety officers are present

Anybody present in the room (including the recruits) is allowed to stop the fight, at any time (using a pre-arranged codeword)

Training was modified after a case of severe head trauma in the early 90's

Safety precautions for simulated fights during scenario training:

Fight is stopped with first knockdown

Immediate medical evaluation if knockdown

Most common injuries:

Finger injuries

Heat stress

Knees sprains

Toe fractures

There has been no serious head trauma in the past 5 years. Approximately five recruits annually are sent to an emergency department for head or neck trauma.

Medical support:

Every instructor is a Certified First Responder

Most instructors are EMT's

A paramedic is located at the Academy, and attends all "high-intensity exercises"

Boxing-based training:

- Goal is to "introduce trauma" to the recruits
- Starting with a three second confrontation, progressing to fixed combinations of movements, for up to 30 seconds
- Emphasis is on skills, not force
- Full-force impacts to the head are not authorized

Head Injury Rate Analysis

The rate of head injury and the rate of serious head injury were significantly greater at TXDPS than at the other public and private training facilities that we surveyed.

TX DPS defensive tactics program

We looked at the head injuries during the Survival and Control Tactics program between December 2003 and May 2005 (See Attachment 3). We found nineteen cases of head injuries, including five severe head injuries. Severe head injuries were defined as causing death or permanent medical separation from the training program. We did not count another case of severe head injury, for which the cause is not known with certainty.

During the period of December 2003 and May 2005, four recruit schools were held (C-03, A-04, B-04 and A-05). A total of 528 recruits entered the Academy during these four recruit schools, but only 451 recruits were enrolled at the beginning of the third month (before the Survival and Control Tactics program).

The rate of head injury during the Survival and Control Tactics program was 3.6%, using the number of recruits entering the Academy, and 4.2% using the number of recruits present at the time of the Survival and Control Tactics program.

The rate of severe head injury during the Survival and Control Tactics program was 0.95%, using the number of recruits entering the Academy, and 1.1% using the number of recruits present at the time of the Survival and Control Tactics program.

Defensive tactics programs—Public sector (basic training)

Federal Law Enforcement Training Center (FLETC)

FLETC is currently training 51,000 students annually in basic programs. The incidence of serious head trauma is less than one case a year.

Two cases of subdural hematoma (bleeding around the brain) happened in 1995 and 2002, both during boxing training at the U.S. Border Patrol Academy at FLETC. After a November 2002 Training Accident Investigation Team report, the U.S. Border Patrol discontinued their boxing program. Boxing is not part of any current training programs at FLETC.

Florida Highway Patrol

The Florida Highway Patrol Academy trains 130 to 140 recruits annually. The duration of basic training is 30 weeks. There has been no serious head trauma in the past eight years. Florida Highway Patrol stopped its boxing program more than 20 years ago.

Significant injuries include fractures of wrist, ankle and long bones. These injuries typically do not lead to permanent medical separation from the training program.

New Jersey State Police

The New Jersey State Police Academy trains 220 to 250 recruits annually. The duration of basic training is 25 weeks. There has been one case of serious head trauma (subdural hematoma) in the past three years, during a boxing exercise, leading to a permanent medical separation from the training program. There was no other case of hospitalization from head trauma in the past three years, from defensive tactics training.

Significant injuries include stress fractures, shoulder and hip injuries, leading to 10 to 20 permanent medical separations annually.

U.S. Secret Service

The U.S. Secret Service Academy trains approximately 500 recruits annually. There has been no serious head trauma in the past 5 years. Approximately five recruits annually are sent to an emergency department for head or neck trauma. The U.S. Secret Service Academy uses short, limited boxing exercises, and full-force impacts to the head are banned.

Defensive tactics programs—Private sector (advanced training)

Close Quarters Defense

Close Quarters Defense has been conducting full-force simulations for the past 19 years, and has trained several thousand Department of Defense employees and federal agents. There has never been any serious head trauma. There has never been any head trauma that required medical attention. There has never been any injury that took a student out of training for more than 24 hours.

Modern Warrior, Inc.

Modern Warrior has trained over a thousand law enforcement officers in full-force simulations, since 1985. There has never been any serious head trauma. There has never been any head trauma that required medical attention. Two injuries required transport to an emergency department (for bone fractures).

John Holschen

John Holschen, currently with Triple Canopy (a company that provides security services and use of force training), is a former Special Forces combatives instructor, who taught for several private and public training organizations. He has been personally involved in over a thousand confrontational simulations, during which no students or instructors received any serious head trauma or any head trauma that required medical attention.

VIII. Recommendations for Reducing Serious Head Injuries during TXDPS Academy Survival and Control Tactics Training

Overview

- The key to reducing serious head injuries is establishing safety procedures in training that are consistently adhered to by all instructor staff and recruits
- Screening for prior head or neurological injuries will generate a negligible reduction of serious head injuries in training
- Headgear will not necessarily protect recruits from serious head injuries due to full-force or repeated strikes to the head in boxing
- Creation of a safe training environment, quick identification and evaluation of head injuries by instructors, and immediate removal from training with medical evaluation of head injuries will create the greatest reduction in serious head injuries

Domenic Coletta, MD, Chief Ringside Physician, New Jersey State Athletic Control Board, stated that head gear could protect against cuts, but that “head gear has been shown to not protect against brain injury, as the mechanism of trauma is the contre-coup phenomenon of the cerebral tissue rocking back and forth in the skull.”

The TXDPS DT Manual (Survival and Control Tactics Role-Play) states (pages 20-22):

- “Self-control: The participant must not execute tactics in a wild manner; he/she shall not lose emotional control or use offensive language. The student must evaluate the tactics executed and defensive tactics must be controlled. The student will cease to fight when commanded by the referee or decrease the power of the strikes when commanded.”
- “Strikes to the head should be done with control and at moderate force (Emphasis on control of execution)”
- “No strikes to the side or back of the head. Impact should be on the protected area only”
- “No strikes to the throat area”
- “Strikes should be controlled/referee is responsible for controlling the SCTR [Survival and Control Tactics Role-Play]”

Further, TXDPS supervisors stated:

- If a participant is not able to defend against head strikes, the other recruit is ordered to strike the participant only in the abdominal area
- If a participant is warned and repeats a violation, corrective action is taken against the violator, for instance, the violator may be instructed to perform 20 push-ups as a penalty

In videos reviewed of full force fighting, the above DT rules were not consistently followed nor enforced. Fighters were not always responsive to referee commands and/or

the whistle. The fight continued despite repeated warnings from referee. Strikes to the head, including to unprotected areas (sides, top and back of the skull), were often observed without control and at full force. These strikes, which violated the rules, did not lead the instructors to stop the fight.

Usually two rings are operating at same time, but with only one “safety officer” monitoring both rings. The safety officer is located outside of the “ring,” made by recruits holding strike pads, and is not in a good position to observe the fights. There usually are other instructors monitoring the bouts, but this is inconsistent. The referee for the fights may not be close enough to the fighters to quickly breakup fights when rules are not being followed. The Florida Highway Patrol Academy has four instructors in close proximity to each fighting pair.

The criteria stated for stopping a fight—subjective assessment (based on first aid training) as to alertness, level of consciousness, pupil reactivity, aware of surroundings, blurred vision, ringing in ears, and headache—is inconsistent and not documented. There is no protocol for stopping fights with head strikes or knockdowns.

Strengths

- The TXDPS Academy has established safety rules for Survival and Control Tactics training
- TXDPS videotapes all of the Survival and Control Tactics training bouts

Areas for Improvement

- There is inadequate Academy staff monitoring bouts during Survival and Control Tactics training
- The Academy rules for Survival and Control Tactics are inconsistent with observed practice
- The criteria for evaluating recruit wellness during and after bouts are subjective, inconsistent, and not documented
- The criteria for stopping a bout and/or calling EMS are subjective and may be biased towards pushing the recruit to complete the required number of rounds, which increases the likelihood of repeated head trauma

Recommendations

- Develop and use a detailed concussion history for candidates and recruits prior to Survival and Control Tactics training

The following guidelines should be strictly observed in all simulations involving force (including boxing, though we do not recommend that such exercise be continued):

- There should be at least one referee and two safety monitors inside each “ring,” in close proximity to the participants during bouts. They should focus their

complete attention on the bout. Safety officers should be trained Academy instructors, knowledgeable about the students, Academy training goals, and Survival and Control Tactics rules.

The referee and safety monitors should be close enough the participants to immediately stop fights when rules are not being followed, warnings are not adhered to, or when fighters display signs suggestive of poor technique or head injury

- The Academy rules for Survival and Control Tactics training should be followed in a consistent manner
- One of the purposes for boxing in the Academy is to learn emotional control. The recruit who demonstrates the inability to follow commands and learn control requires additional training and should not be allowed to continue uncontrolled behavior. Allowing such a recruit to continue fighting a bout not only reduces the effectiveness of the training, but also increases the likelihood of injuries. After being warned once concerning infractions of rules for engagement, with a repeated infraction, the fight should be immediately stopped, and the offending recruit provided remedial training and rescheduling of training for another day, and, if called for, the recruit should be subject to disciplinary action.
- Likewise, a recruit who demonstrates the inability to defend him/herself, especially against head strikes, should be removed from training that day, provided remedial training, and rescheduling of training for another day. To do otherwise is to invite serious head injuries.
- A checklist for wellness assessments, especially after head strikes, should be developed and used by all Academy staff participating in Survival and Control Tactics training
- Documentation of the results of these wellness assessments should be maintained for periodic review and audit
- Documented and consistently followed criteria for stopping bouts during Survival and Control Tactics training should be developed. The determination to stop a bout after a head strike should not be based upon the recruit's determination to continue but on objective criteria. We recommend using the "one-knockdown rule." If a recruit receives a head strike and falls down or is disoriented, the fight is over for the day, and that recruit is immediately sent for medical evaluation.
- Formalized and periodic (yearly) training for all Academy instructor staff participating in Survival and Control Tactics training should be provided. This training should include, but not be limited to: review of previous training injuries, rules of fighting, suggestions for improvement, and a medical session on the signs and symptoms of head injuries. The medical session should include the detection of concussion, its clinical features, assessment techniques, and principles of safe return to training. An outside instructor with experience in sports-related head injuries should be sought to co-sponsor this training.
- A physician trained in sports medicine, with extensive experience of sports-related head injuries, should evaluate all Academy head injuries and provide a return to training medical determination.

See Attachment 11 for a more detailed discussion.

Attachment 1

TXDPS Staff Interviewed during Site Visit

A. Administration Division

Lester Mills, Asst. Chief, Administration, Staff Support Service

Curly Colquitt, Asst. Commander, Human Resources

Jay Sams, Risk Manager, Program Administrator, Health and Safety Section, Human Resources

B. Training Academy

Albert Rodriguez, Commander, Training Academy

Scot Houghton, Captain, Training Academy, Operations Supervisor

Micki Scheffler, Lieutenant, Training Academy, Recruit School (in charge of recruit school) and Physical Training

Erwin Ballarta, Lieutenant, Training Academy, Defensive Tactics

Kelvin Dews, Sergeant, Defensive Tactics

Michael Smith, Sergeant, Training Academy, Physical Training

Sam Culpepper, Sergeant, Training Academy

Attachment 2

TXDPS Documents and Videos Reviewed

TXDPS Documents Reviewed

Texas Department of Public Safety and Training Academy Organization Charts
Job Descriptions; Commander, Captain, Lieutenant, and Sergeant, TXDPS Training Academy

Medical Physical Standards for Trooper-Trainee (Texas DPS)
HR-28, TXDPS Personal History Statement Medical-Related Inquiries (HR-utilized candidate medical history form)

Texas Department of Public Safety Notice to Physician (certificate of applicant medical examination and medical qualification statement by physician)

Medical Evaluation for Defensive Tactics Training (used prior to OC spraying)

A-2005 All Field Service Recruit Training School Notebook, 1/24/05—8/5/05 (training academy requirements, workers' compensation, and personnel policies/forms manual for recruits)

Academy instructors curriculum vitas

Use of Force Training Information Sheet and Medical Evaluation for Defensive Tactics Training (used by DT instructor staff)

Academy monthly student count, A-99 through A-05

Academy Physical Fitness Program orientation

Academy Arrest and Control Tactics orientation

Academy Defensive Tactics Training Program overview (Powerpoint presentation)

TXDPS Defensive Tactics Manual: Overview, Use of Force, Liability, Techniques, Stances, Movement Orientation/Body Position, Personal Weapons, Straight Baton/Impact Weapon Tactics, Confrontation Checklist, Survival Control Tactics Role-play (OC, edged weapon, grappling, etc.), Handcuffing, Sam Browne Configuration, Aerosol Projector Certification Course, Custody Death, and PPCT Defensive Tactics Student Manual

Defensive Tactics Practical Test

Academy Defensive Tactics schedule

A-05 Recruit School Health/Physical Fitness Assessments (every 6 weeks)

Physical Fitness Worksheet (Class A-05) listing PT program elements

Development and Validation of Trooper Physical Ability and Cognitive Ability Tests, PR Jeanneret, et. al., May 1991

Listing of DPS Trooper Schools, 1994A—2005A

TXDPS Trooper-Trainee Rosters, classes 2000A—2005A (showing individual student drop outs, by name)

TXDPS 130th A-2005 All Field Service Recruit Training, 1/24/05—8/5/05 (recruit training course listings and schedules)

A-2005 Recruit Schedule Hours Justification, 12/13/04 (schedule adjustments from B-2004 to A-2005)

Workers' Compensation Insurance Organization Injury Description Code (Nature of injury, Cause of injury, and Body Part table)
Selected TXDPS Academy Workers' Compensation Claims Loss for FY 2004 and 2005 (name, class, Nature/Cause of injury, and Body part)
TXDPS Cause of Injuries by Year, FY 1996—2005
TXDPS Recruit School Injuries, Number of Recruits Hospitalized, 1996—2005
TXDPS Recruit School Injuries, 74—Active Countermeasures, FY 1996—2005
TXDPS Recruit School Injuries, 60—Physical Training, FY 1996—2005
TXDPS Workers' Compensation claims 10/4/99—7/6/05
Medical Report, Jorge E. Loyez, MD, board-certified neurologist, dated 9/1/04, concerning Victoriano Perez
Medical Report, Juan H. Gonzalez, board-certified family physician, dated 2/22/05, concerning Victoriano Perez
Texas DPS Accident Investigation by Jay Sams, Recruit Jimmy Carty Jr., 7/1/05
Attorney General/Workers Compensation Case Notes, Christopher Nelon
Training Academy Civilian Advisory Board Minutes, 12/11/01, 12/11/02, 12/15/03, 12/15/04, and 12/21/05
Arrest and Control Tactics Program Time Line

TXDPS Videos Reviewed (Survival and Control Tactics)

We watched videos of selected grappling and force-on-force exercises that took place on the following days:

3/28/05
3/30/05
4/12/05
5/19/05

Attachment 3

Head Injuries in Survival and Control Tactics Training 12/16/03—5/19/05

<u>DOI</u>	<u>Type of Injury/Cause of Injury</u>	<u>RTT/MMI*</u>
12/16/03	Concussion with boxing	12/30/03
12/16/03**	Concussion with boxing	No
	Sought personal physician evaluation in Houston. On 12/23/03, cleared to return to training, but “avoid activity that leads to further head injury.” On 12/31/03, 2 nd Houston physician restricted him from training. Terminated on 4/13/04.	
12/17/03	Head injury with boxing	1/5/04
	SW Orthopedics clearance of Right ankle, no clearance for head injury.	
12/17/03	Contusion with boxing	12/30/03
	Dizzy per supervisor after head hit. Probable Grade II concussion.	
12/17/03	Contusion with boxing	1/19/04
4/7/04	Concussion with boxing	4/10/04
	Hit in head, fell to floor. RTT not signed by physician.	
4/7/04	Concussion with boxing	4/8/04
	Post-traumatic tinnitus (ringing in ears).	
4/8/04**	Concussion with boxing	4/16/04
4/8/04	Concussion with boxing	4/9/04
5/4/04**	Concussion with boxing	No
	Not medically cleared. Did not return to training.	
5/4/04	Concussion with boxing	5/17/04
5/4/04	Concussion with boxing	5/17/04
	Ruptured Left eardrum. No assessment of eardrum; no hearing evaluation.	
5/5/04	Concussion with boxing	5/17/04
6/15/04	Possible concussion with boxing	No
12/9/04	Left jaw injury with boxing	12/18/04
12/9/04	Concussion with boxing	12/23/04
3/28/05	Concussion with boxing	4/14/05
3/28/05	Neck strain with choking	3/29/05
3/30/05	Left jaw injury with boxing	4/25/05
4/6/05**	Concussion with boxing	No
	Intracranial hemorrhage. Resigned 4/25/05.	
5/19/05**	Contusion with boxing	No
	Several head hits, at least 3 knockdowns. Subdural hemorrhage. Death on 5/26/05.	

* RTT/MMI Date of Return to training/Maximum medical improvement
 ** Significant head injury due to boxing

Attachment 4

Article originally published in The Police Marksman, January/February 2002

Martial Arts for Cops, The Dark Side - Fists of Frenzy

By: Phil Messina and Fabrice Czarnecki M.D.

Scenario #1: The officer approaches the suspicious male after informing him that he fits the description of someone wanted for a recent felony assault. Suddenly the suspect stiffens up and spins on the officer. The officer jumps back, clinches his hands into a fist and as the suspect throws a punch, the officer blocks and counters with a right cross to the jaw and then brings the suspect down into a handcuffing position.

Scenario #2: The officer approaches the suspicious male after informing him that he fits the description of someone wanted for a recent felony assault. Suddenly the suspect stiffens up and spins on the officer. The officer jumps back, clinches his hands into a fist, and as the suspect throws a punch, the officer blocks and counters with a right cross intended for the jaw, but the suspect quickly turns causing the officer's fist to crash into the suspect's teeth. The suspect is eventually subdued and all is well until the officer dies from a fluid transferable disease several years later. Unfortunately his family doesn't receive line of duty benefits because there's no proof that the decease came from the line of duty incident.

Scenario #3: The officer approaches the suspicious male after informing him that he fits the description of someone wanted for a recent felony assault. Suddenly the suspect stiffens up and spins on the officer. The officer jumps back, clinches his hands into a fist and as the suspect throws a punch, the officer blocks and counters with a right cross intended for the jaw, but the suspect quickly ducks his head causing the punch to land on the suspects skull, shattering the officer's hand. The suspect now reaches into his pocket and pulls a handgun as the officer tries in vain to remove his own firearm from his holster.

Scenario #4: The officer approaches the suspicious male after informing him that he fits the description a someone wanted for a recent felony assault. Suddenly the suspect stiffens up and spins on the officer. The officer jumps back, clinches his hands into a fist and as the suspect throws a punch, the officer blocks and counters with a right cross intended for the jaw, but the suspect quickly ducks his head causing the punch to land on the suspects skull, shattering the officer's hand. The suspect now grabs for the officer's holstered firearm and easily removes it as the officer tries in vain to retain it with his severely injured hand. The suspect then shoots the officer and several bystanders.

Scenario #5: The officer approaches the suspicious male after informing him that he fits the description a someone wanted for a recent felony assault. Suddenly the suspect stiffens up and spins on the officer. The officer jumps back, clinches his hands into a fist and as the suspect throws a punch, the officer blocks and counters with a right cross

intended for the jaw, but the suspect quickly ducks his head causing the punch to land on the suspect's skull, shattering the officer's hand. The suspect then pulls a knife from his waistband and somehow, despite his injury, the officer manages to draw his gun. Unfortunately because of the instability of the officer's injured hand, it takes several rounds before the officer hits the suspect and one of the missed rounds kills an innocent bystander.

Scenario #6: The officer approaches the suspicious male after informing him that he fits the description of someone wanted for a recent felony assault. Suddenly the suspect stiffens up and spins on the officer. The officer jumps back, clinches his hands into a fist.

Tragically this time the officer had approached with his firearm in his hand, and although he had his finger outside the trigger guard the "fist reflex" he developed during his training, now kicks in, causing an involuntary discharge of his weapon. The suspect turns out to be innocent and the officer and his family suffer many years of torment in the hope that a good cop doesn't wind up in jail.

Unfortunately this "Groundhog's Day" approach is necessary to make an important point. When officers are trained to rely on fisted strikes to control suspects many things can happen. And most of them are bad!

In 1991, after noticing many involuntary discharges during high stress simulation training, Modern Warrior Defensive Tactics Institute in conjunction with the International Defensive Tactics and Research Foundation conducted a two year experiment involving 168 officers to help determine the root causes of involuntary discharges under stressful conditions. Prior to the experiment, it was assumed that officers that kept their finger out of the trigger guard would have much lower instances of involuntary discharge. Although this proved true in many cases, it had little or no effect in cases involving the "startle response" with 12 of the 25 officers who had involuntary discharges having their fingers off the trigger just prior to the startle stimulus being introduced.

This research strongly indicated that a phenomenon now referred to as the "fist reflex" played a larger role in involuntary discharges due to "startle response" than finger placement did. It also indicated that the "fist reflex" is enhanced by training which puts heavy emphasis on fisted strikes and can be greatly reduced by training which de-emphasizes fisted strikes and replaces them with non fisted strikes (palm strikes, wrist strikes, elbow strikes, etc.) Since this experiment Modern Warrior has completely removed all fisted strikes from its law enforcement programs with dramatic results. No officer certified by Modern Warrior after 1993 has had an involuntary discharge in either high stress simulations or in the line of duty.

Despite this and other research, which identifies an injured dominant hand as the leading arrest related injury, many trainers still refuse to modify their training. This is largely due to the fact that they themselves come from martial arts systems which place heavy emphasis on fisted strikes (boxing, karate, etc.). Their unwillingness to retrain themselves

or leave their personal comfort zones is perhaps one of the biggest hindrances to effective law enforcement training today.

In preparation for this article, Dr. Fabrice Czarnecki was asked to give a medical evaluation of fisted strikes (for law enforcement) as opposed to non fisted alternatives. Dr. Czarnecki is an Emergency Physician who specializes in law enforcement injuries and training. His comments are as follows:

"For the officer, using a punching technique might be both dangerous and ineffective. Breaking bones of your own hand can be fairly common when punching a hard surface, like the head. Try to punch a coconut! The fracture of the fifth metacarpal bone became so well associated with punching that it is called the "boxer's fracture". And complications can be serious. An open-hand technique would be safer for the officer, while also being more effective."

When asked to comment on the relationship between training with fisted strikes and involuntary discharges, Dr. Czarnecki had this to say:

"One hand tends to follow the movement of the other one, under stress. There are cases of officers having an accidental [involuntary – ed.] discharge with their firearm, while activating a pepper spray with the other hand. If prior training habits conditioned the officer to make a fist when threatened, the risk of an accidental discharge under stress is increased."

In an article published by the ASLET Journal (March/April, 1994) Defensive Tactics Trainer George Demetriou quotes Dr. Stuart Kandel, a highly respected Orthopedic Surgeon with the following statements: "When you open your hand from a fist, the tendons pull back. If the knuckles are cut when a taut fist strikes the teeth, the act of opening the hand pulls bacteria in. Serious infection can set in 24-48 hours later. Germs do not fester in the fleshy part of the hand as they do in the knuckles. There have been cases where cuts caused by human teeth on knuckles resulted in the hand being surgically removed to stop the spread of gangrene."

It is understandable that many trainers have been reluctant to modify their law enforcement training to exclude fisted punches. Our culture, tradition, and even entertainment industry have always associated punching with physical combat. Many of our television and movie role models are depicted as "two fisted heroes".

However in the real world, the true heroes are the men and women who risk their lives to protect our society. And those heroes are often second-guessed, criticized and sometimes prosecuted for doing exactly what they were trained to do.

It is not only the responsibility, but also the duty of those of us that train those heroes to be willing to re-evaluate our traditions and tip our "sacred cows" whenever necessary.

Phil Messina is a retired N.Y.P.D. Sgt., President of Modern Warrior® and one of the developers of the Tactical Groundfighting System. He has almost 40 years Martial Arts experience.

Article reprinted with permission of The Police Marksman magazine
www.policemarksman.com

Attachment 5

List of possible providers of appropriate protective equipment

Off-the-shelf protective suits for police training

Fist, Inc.

www.fist-inc.com

800-443-3478

Fist, Inc. offers several protective suits, of different weights. The heavy Fist suit (#333) is used by Florida Highway Patrol Academy and the Federal Law Enforcement Training Center. Fist indicates that the #333 Fist suit allows baton strikes. Some trainers find that the heavy #333 Fist suit can be too restrictive on the mobility of the role player. A lighter Fist suit (#99TS) offers more mobility, but does not allow full-force contact.

HIGH GEAR

www.tonyblauer.com

BLAUER Tactical Systems

877-773-2748

HIGH GEAR is a protective suit that provides good mobility. It is used by the Federal Law Enforcement Training Center for groundfighting and for light contact defensive tactics scenarios that do not involve baton strikes.

RedMan

www.redmangear.com

800-865-7840

Macho Products, Inc.

10045 102nd Terrace, Sebastian, FL 32958 USA

RedMan offers two types of protective suits for training. The RedMan WDS suit is designed for defensive tactics and training projectiles. The RedMan XP suit is designed for defensive tactics and baton training. RedMan suits are used by the Federal Law Enforcement Training Center, the U.S. Secret Service Academy and the New Jersey State Police (for baton training only). Some trainers find that the facial cage of the XP suit can cause finger injuries, and should be covered with a Plexiglas shield. The RedMan XP & WDS Product Guide only allows up to "light blunt force to the covered head, throat, and neck".

Custom-made protective suits for police training

Close Quarters Defense

www.cqd.net

877-822-7161

6184 Ocean Gateway, Trappe, MD 21673

Close Quarters Defense is using protective suits manufactured by Fist, Inc. to special specifications, which Close Quarters Defense indicates will allow full-force training without any restriction.

Modern Warrior, Inc.

www.modernwarrior.com

631-226-8383

711 N. Wellwood Avenue, Lindenhurst, NY 11757

Modern Warrior is using RedMan suits with additional protections developed by the training staff, which Modern Warrior indicates allow full-force training. A Modern Warrior suit is typically made of the following elements: A RedMan suit, motocross chest and shoulder protector, ice packs on the chest, back and neck (to protect against blunt trauma and against head injury), a RedMan helmet modified to prevent cervical spine injuries, and a hockey Plexiglas facial shield, at an angle to deflect blows.

While the authors have mentioned a number of products and schools for consideration by TXDPS, they are not endorsing these products or schools. Members of the Gables Group have participated as instructors in classes at the Federal Law Enforcement Training Center (FLETC) and Modern Warrior, Inc.

Attachment 6

Training Organizations

Trainers' association

International Law Enforcement Educators and Trainers Association

www.ileeta.org

262-279-7879

P.O. Box 1003, Twin Lakes, WI 53181-1003

Executive Director: Ed Nowicki

Defensive tactics school – Public sector

Federal Law Enforcement Training Center

Physical Techniques Division

www.fletc.gov

912-267-2405

Defensive tactics schools – Private sector

ACMi Systems LLC

www.acmisystems.net

414-688-5572

Lead instructor: Gary Klugiewicz

Close Quarters Defense

www.cqd.net

877-822-0451

6184 Ocean Gateway, Trappe, MD 21673

Lead instructor: Duane Dieter

Modern Warrior, Inc.

www.modernwarrior.com

631-226-8383

711 N. Wellwood Avenue, Lindenhurst, NY 11757

Lead instructor: Philip Messina

Triple Canopy

www.triplecanopy.com

703-673-5774

2250 Corporate Park Drive

Herndon, VA 20171

Contact: John Holschen

While this list is not comprehensive, we believe that these schools provide excellent instruction in defensive tactics and simulations training, at an instructor's level.

While the authors have mentioned a number of products and schools for consideration by TXDPS, they are not endorsing these products or schools. Members of the Gables Group have participated as instructors in classes at the Federal Law Enforcement Training Center (FLETC) and Modern Warrior, Inc.

Attachment 7

IADLEST Survey

We surveyed State POST (Police Officers Standards and Training) directors with the help of the International Association of Directors of Law Enforcement Standards and Training (IADLEST).

We received responses from the following 21 states:

- Arkansas
- Colorado
- Connecticut
- Florida
- Hawaii
- Idaho
- Indiana
- Iowa
- Missouri
- Maine
- Maryland
- Massachusetts
- Nevada
- New Hampshire
- North Dakota
- Oklahoma
- Oregon
- South Dakota
- Utah
- Virginia
- Washington

Thirteen states do not conduct any boxing as part as the police defensive tactics training:

- Arkansas
- Colorado
- Connecticut
- Florida
- Hawaii
- Idaho
- Indiana
- Massachusetts
- New Hampshire
- North Dakota
- Oregon

- South Dakota
- Utah

In six states, some training academies were using boxing, but stopped doing it. The reasons for stopping boxing were provided in three responses: Liability and injuries (in two responses), and availability of more effective techniques (in one response).

Seven states conduct boxing as part as the police defensive tactics training:

- Missouri (in 3 out of 20 licensed basic training centers)
- Iowa
- Maine
- Maryland (only by the Maryland State Police)
- Nevada
- Oklahoma (only by the Oklahoma Highway Patrol)
- Washington (if time allows)

For one state (Virginia), we were told that boxing might be still be used.

Attachment 8

Role of a Law Enforcement Agency Occupational Medicine Physician

1. Develop knowledge about TXDPS commissioned officer job functions and training requirements, including those of specialty units, by observing training and performance of job functions;
2. Develop understanding of potential hazardous job exposures for officers and civilians working in the TXDPS and other potentially hazardous assignments to recommend and review medical surveillance procedures and protective equipment needs;
3. Develop/recommend and enhance medical guidelines for TXDPS positions, especially the methodology for return to work decisions;
4. Provide medical recommendations to TXDPS concerning candidate medical clearance and recruit return to training;
5. Assist the TXDPS in the selection and education of medical specialty consultants
6. Develop/recommend procedures for emergencies involving the TXDPS;
7. Develop/recommend Academy safety procedures and in-service medical training of Academy instructors (e.g., identification and prevention of serious head injuries);
8. Develop involvement with other occupational medicine physicians working with law enforcement agencies, through organizations such as the American College of Occupational and Environmental Medicine (Public Safety Section) and the International Association of Chiefs of Police (Police Physicians Section); and
9. Develop/recommend proactive collaboration with area medical centers and providers to promote wellness, health and fitness within the TXDPS.

Attachment 9

Recommendations for Enhanced Candidate Cardiac Screening

The American College of Sports Medicine (ACSM) in the ACSM's Guidelines for Exercise Testing and Prescription recommends a thorough cardiac evaluation for individuals at Moderate and High risk prior to participation in vigorous exercise. The TXDPS Academy training and the job of TXDPS commissioned officer qualify as vigorous exercise.

The ACSM defines Moderate Risk as, "Men \geq 45 years of age and women \geq 55 years of age *or* those who meet the threshold for two or more risk factors from **Table 2-2**."

The ACSM defines High Risk as, "Individuals with one or more signs and symptoms listed in **Table 2-3** *or* known cardiovascular (cardiac, peripheral vascular, or cerebrovascular disease), pulmonary (chronic obstructive pulmonary disease, asthma, interstitial lung disease, or cystic fibrosis), or metabolic disease (diabetes, thyroid disorders, renal or liver disease)." High Risk would include definite or suspected heart attack or stroke, coronary bypass surgery, angioplasty/stent, and diabetes under treatment.

The ACSM recommends that the following screening tests be performed for Low Risk and Moderate Risk individuals prior to beginning an exercise program:

- Comprehensive medical history
- Height, weight and blood pressure
- Physical exam
- Fasting total cholesterol, LDL cholesterol, HDL cholesterol, and triglycerides
- Fasting blood glucose
- Thyroid function

The ACSM recommends that the following additional tests be performed for High Risk individuals prior to beginning an exercise program:

- Cardiac studies, such as resting electrocardiogram (ECG), Holter monitoring, exercise test with/without imaging, and echocardiogram
- Chest x-ray
- Pulmonary function testing

Table 2-2. Coronary Artery Disease Risk Factor Thresholds for Use With ACSM Risk Stratification

Family history	Myocardial infarction, coronary revascularization (bypass, stent, etc.), or sudden death before 55 years of age in father or other male first-degree relative (i.e., brother or son), or before 65 years of age in mother or other female first-degree relative (i.e., sister or daughter).
Cigarette smoking	Current cigarette smoker or those who quit within the past 6 months.
Hypertension	Systolic blood pressure of ≥ 140 mm Hg or diastolic ≥ 90 mm Hg, confirmed by measurements on at least 2 separate occasions, or on antihypertensive medication.
Hypercholesterolemia	LDL cholesterol of > 130 mg/dl or HDL cholesterol < 40 mg/dl, or on lipid-lowering medication.
Impaired fasting glucose	Fasting blood glucose of ≥ 100 mg/dl confirmed by measurements on at least 2 separate occasions.
Obesity	Body Mass Index (BMI) of ≥ 30 kg/m ² , or waist girth of > 40 inches (102 cm) for men and > 35 inches for women (88 cm).
Sedentary lifestyle	Persons not participating in a regular exercise program or meeting the minimal physical activity recommendations from the U.S. Surgeon General's report.

Negative Risk Factor (If present, negates one of above risk factors)

High HDL cholesterol > 60 mg/dl

Table 2-3. Major Signs or Symptoms Suggestive of Cardiovascular, Pulmonary, or Metabolic Disease (Modified by R. Miller)

Pain, discomfort in the chest, neck, jaw, arms, or other areas that occurs at rest or during physical activity
Shortness of breath or wheezing at rest or with mild exertion
Dizziness, fainting or blackouts
Difficulty breathing except in an upright position or episodes of respiratory distress that awaken person from sleep
Ankle edema (swelling of feet, ankles or lower legs unrelated to injury)
Heart palpitations (irregular or racing heartbeat on more than one occasion)
Intermittent claudication (leg pain that causes you to stop walking)
Known heart murmur
Unusual fatigue or shortness of breath with usual activities

Resting Electrocardiogram

The resting electrocardiogram (ECG) has become the most extensively used noninvasive diagnostic and prognostic tool in cardiology. The ECG has significant utility for rhythm analysis (premature or irregular heart rhythm), detection of ischemia and hypertrophic heart disease. With its low cost and widespread availability, the ECG has strong support for cardiac risk evaluation in both men and women.

“The standard 12-lead ECG is of limited diagnostic value for detecting coronary artery disease in an asymptomatic masters (athletes >35 years of age) population, particularly given the variability of ECG patterns associated with athletic training. Nevertheless, the ECG, when used as part of a pre-participation screening evaluation, may occasionally identify unexpected evidence of a healed myocardial infarction and can also be particularly helpful in detecting certain diseases less common in the masters population, such as hypertrophic cardiomyopathy; long-QT, Brugada, and Wolff-Parkinson-White syndromes; and arrhythmogenic right ventricular cardiomyopathy. For these reasons, a standard 12-lead ECG is recommended as part of a routine evaluation for all masters athletes (male and female) >40 years old.”

Recommendations

1. That the HR-28 form be modified with the following:
 - a. Family history, as stated in ACSM table 2-1.
 - b. Major signs or symptoms suggestive of cardiovascular and pulmonary disease, as stated in ACSM Box 2-1.
 - c. Added the question, “Have you ever been told by a health professional that you have had an abnormal resting or exercise (treadmill) electrocardiogram (ECG)?”
 - d. Bundle HR-28 questions dealing with cardiovascular risk assessment to allow easier identification of high-risk candidates. A sample preparticipation screening questionnaire from ACSM is found on page 25 of the ACSM Guidelines.
2. That all candidates be screened with fasting total cholesterol, LDL cholesterol, HDL cholesterol, triglycerides, and blood glucose (these can usually be bundled for cost savings). We do not believe that thyroid function testing on initial screening is required.
3. That all candidates receive a resting ECG.
4. That all candidates defined as “High Risk” be referred to a cardiologist for vigorous exercise clearance.
5. That all candidates defined as “Moderate Risk” be assessed by the occupational medicine physician for cardiac, pulmonary, and metabolic disease/risk factors and provide recommendations to the TXDPS concerning performing a Chest x-ray or a cardiology, pulmonary, or endocrinology (diabetes and thyroid) referral.

Attachment 10

Recommendations for Blood Pressure Guidelines During Academy Training

Hypertension is probably the most common cardiovascular condition in the general population and with competitive athletes. A blood pressure above 140 systolic and/or 90 diastolic is considered hypertension. Since hypertension is a risk factor for heart disease and stroke, individuals with consistent (serial measurements over time) hypertension should be medically evaluated for treatment.

Hypertension is currently classified as follows:

	Systolic BP	Diastolic BP
Normal	<120	And <80
Prehypertension	120-139	Or 80-89
Stage 1 Hypertension	140-159	Or 90-99
Stage 2 Hypertension	≥ 160	Or ≥ 100

The presence of Stage 1 hypertension, without evidence of other cardiovascular disease, should not limit the eligibility for any competitive sport. Evidence of cardiovascular disease should be determined during the candidate medical screening process. Individuals with Stage 2 hypertension, even without evidence of target organ (heart, brain) damage should be restricted in their exercise program, particularly from high static sports (weight training, wrestling, cycling, rowing, etc.), until their hypertension is controlled by either lifestyle modification or drug therapy. Hypertensive athletes (Stages 1 and 2) should be periodically re-measured to monitor the impact of the exercise program on their blood pressure.

Because of the documented benefits of exercise in lowering blood pressure and improving other coronary risk factors, the engagement of regular forms of exercise may be of benefit to hypertensive individuals. Athletes with Stage 2 hypertension should be restricted, particularly from highly static competitive sports until their blood pressure is controlled.

Recommendation

Consistent (2 or more measurements 10 minutes apart) Stage 2 high blood pressure should prohibit physical and defensive tactics training until a) blood pressure has been treated and a physician's statement has been provided stating that there are no limitations for vigorous exercise and/or b) reduction of blood pressure below 160/100.

Attachment 11

Recommendations for Reducing Serious Head Injuries During Survival and Control Tactics Training

Background

The key to reducing head injuries and its serious complications is by ensuring that training consistently adheres with established safety procedures. The primary cause of serious head injuries is head trauma, especially repeated head trauma. Screening for prior head or neurological injuries in order to reduce serious head injuries will generate a negligible reduction of serious head injuries in training. There is no clinical evidence that currently available protective equipment will prevent concussions. Creation of a safe training environment, quick identification and evaluation of head injuries, and immediate removal from training and medical evaluation of head injuries will generate the greatest reduction in serious head injuries. Referees and instructors enforcing rules during training is critical to reduction of head injuries.

Head injuries or concussions are very common with over 1 million new cases of traumatic brain injury in the United States each year, with more than 50,000 deaths and 90,000 persons developing long-term disability yearly. Boxing has a very high rate of serious head injuries among organized athletic activities.

A subdural hematoma is one of the serious complications of a head injury, caused by torn blood vessels in the space between the two outer membranes covering the brain. Blood escaping from the blood vessels put pressure on the brain causing headache, confusion, or death as the brain is squeezed against the unyielding walls of the skull.

The following guidelines have been provided to reduce head injuries from becoming serious head injuries:

Any athlete/recruit with a concussion should be removed from competition.

A physician, familiar with sports-related head injuries, should assess every athlete/recruit with a concussion.

No athlete/recruit should be allowed to return to play/train until he/she is completely asymptomatic at rest and with exertion.

Regular ongoing and repeated examination of the athlete/recruit should be conducted following injury.

Physical activities, that may cause head injuries, occurring without physician supervision, must be closely supervised to detect those head injuries that require activity cessation and medical evaluation. Education of instructor staff as to what to look for and how to respond after head injuries is critical. The goal of the training program should be to avoid having any head injury (head strike during training) become a serious head injury.

Definition and Identification of Head Injury/Concussion

A head injury for the purposes of this report is anytime a head strike occurs during Survival and Control Tactics training. A serious head injury is a head strike with consequences; consequences which are most variable, from a concussion with brief confusion to a subdural hemorrhage and death. A serious head injury occurring during sports or training has many names with no consistent definition. A concussion or traumatic brain injury are the most common terms used to define a serious head injury. Concussion is the term that will be used for a serious head injury for this Attachment.

Definitions of concussion include, “a traumatically induced alteration in mental status with or without associated loss of consciousness.”

The “Summary and Agreement Statement of the 2nd International Conference in Sport, Prague 2004,” states the following consensus definition of a **sports concussion**.

“Sports concussion is defined as a complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces. Several common features that incorporate clinical, pathologic and biomechanical injury constructs that may be utilized in defining the nature of a concussive head injury include:

Concussion may be caused either by a direct blow to the head, face, neck or elsewhere on the body with an ‘impulsive’ force transmitted to the head.

Concussion typically results in the rapid onset of short-lived impairment of neurologic function that resolves spontaneously.

Concussion may result in neuropathological changes but the acute clinical symptoms largely reflect a functional disturbance rather than a structural injury.

Concussion results in a graded set of clinical syndromes that may or may not involve loss of consciousness. Resolution of the clinical and cognitive symptoms typically follows a sequential course.

Concussion is typically associated with grossly normal structural neuroimaging studies.”

The Prague Conference categorized concussions as “Simple Concussion” or Complex Concussion.” All concussions mandate evaluation by a physician.

A **Simple Concussion** describes a head injury that progressively resolves without complication over 7-10 days. No intervention is needed other than limiting sports or training. Management involves rest until all symptoms resolve with a graded program of exertion before return to sports or training. This is the most common type of concussion.

A **Complex Concussion** describes a head injury with persistent symptoms, specific complications (seizures, loss of consciousness over 1 minute, or prolonged cognitive impairment). This may include those who suffer multiple concussions over time. Specialized medical evaluation (sports neurologist, neurosurgeon) is required.

“Recognizing the importance of concussion history, and appreciating the fact that many athletes will not recognize all the concussions they may have suffered in the past, a detailed concussion history is of value.”

Signs and Symptoms of Acute Concussion include the following:

Cognitive Features (unawareness of surroundings, confusion, amnesia, loss of consciousness);

Typical Symptoms (headache, dizziness or balance problems, nausea, visual problems or seeing stars, hearing problems or ringing in the ears, irritability, fatigue)

Physical Signs (impaired or loss of consciousness, poor coordination or balance, seizure, slow responses, poor concentration, inappropriate emotions, vomiting, vacant stare, slurred speech, personality changes, inappropriate playing ability)

The **Sport Concussion Assessment Tool (SCAT)** is a tool that can be used for patient education or for physician assessment of sports concussion. The SCAT can be used by asking the athlete to score themselves based on how they currently feel. In using any tool, such as the SCAT, it is important to remember that anyone with any cognitive, symptom or sign of concussion should be a suspect and immediately referred for further medical evaluation. The medical evaluation should be performed by a physician who has significant experience in evaluating and managing sports-related head injuries. This tool is provided in Attachment 12.

It is important to note that brief (< 1 minute) loss of consciousness, as an isolated marker, has not been shown to reflect either severity or neurophysiological performance, nor association with neuroimaging or electrophysiologic abnormalities. Despite the many symptoms being attributable to concussion, few athletes are aware of their injuries and/or their significance. Of all the symptoms confusion is the most common. This is one reason why it is important to manage the athlete on the basis of objective evaluation and not on whether the athlete thinks that he/she can continue the sport.

Second Impact Syndrome

Serious complications and risks are associated with the premature return to sports or training of an individual with a concussion. **Second Impact Syndrome**, resulting from a second concussive injury closely following the first, should be prevented. This syndrome involving repeated head trauma may involve concussions that separately might be considered mild, but in additive effect become serious or fatal. After an initial concussion the brain cells are in a very vulnerable state, and if subjected to another shock (concussion) prior to complete recovery, further injury will lead to serious injury and/or death.

Due to the vulnerable state of the brain and head, sustaining a concussion makes concussions more likely and more serious with further head injuries. In one study, 17 deaths were likely linked to second impact syndrome, with all victims returning to play before symptoms related to an initial concussion were resolved. Repeated concussions

should be avoided as this can lead to chronic brain injury and permanent cognitive changes. A study showed that following sports-related concussions, athletes required several days for recovery of symptoms, cognitive dysfunction and postural instability.

Return to Training Determinations

Many medical protocols have been developed concerning return to training/play after a head injury. These protocols differ in many ways: the definition of brief versus prolonged loss of consciousness, concussion grading systems (Grades I, II, and III) with differing measurements of loss of consciousness or posttraumatic amnesia, and recommendations for return to play. The protocols base their return to training/play based on the type and time concussion symptoms are present, whether and how long posttraumatic amnesia has presented, and whether and how long loss of consciousness has presented.

Some of the protocols and recommendations for return to play with the mildest concussion (concussion symptoms lasting less than 15 minutes, no posttraumatic amnesia, no loss of consciousness, and based on a physician's examination) are:

Colorado Medical Society	Return to play when asymptomatic for 20 minutes
American Academy of Neurology	Return to play when asymptomatic for 15 minutes
Cantu	Return to play when asymptomatic

Rather than trying to understand the difference between the protocols and choose one for use, it is important to develop a relationship with a physician who has significant experience in evaluating and managing sports-related head injuries, and refer all head injuries to this physician for evaluation.

The basics of concussion management, based on the 2004 International Conference on Concussion in Sport are summarized as follows.

When any player shows ANY symptoms or signs of a concussion:

The player should not be allowed to return to play in the current game or practice.

The player should not be left alone; and regular monitoring for deterioration is essential over the initial few hours following injury.

The player should be medically evaluated following the injury.

Return to play must follow a **medically supervised** stepwise process.

The return to play following a concussion follows a step-wise process:

No activity, complete rest. Once asymptomatic, proceed through the following levels.

Light aerobic exercise such as walking or stationary cycling, no resistance training.

Sport-specific exercise (e.g., skating in hockey, running in soccer), progressive addition of resistance training.

Non-contact training drills.

Full contact training after medical clearance.

Game play.

With this stepwise progression, the athlete should continue to proceed to the next level if asymptomatic at the current level. If any post concussion symptoms occur, the athlete should drop back to the previous asymptomatic level and try to progress again after 24 hours. In addition to being symptom-free, the athlete should not be taking any medication that may effect or modify the symptoms of concussion.

Recommendations

Develop and utilize a detailed concussion history for candidates and recruits prior to Survival and Control Tactics training.

Training bouts should only be performed where there is adequate and close instructor supervision. There should be at least one referee and two safety monitors inside each ring, in close proximity to fighters during bouts. They should focus their complete attention on the bout. Safety monitors should be trained Academy instructors, knowledgeable about the students, Academy training goals, and Survival and Control Tactics rules. The referee and the safety monitors should be close enough to fighters to immediately stop fights when rules are not being followed, warnings are not adhered to, or when fighters display signs suggestive of poor technique or head injury.

Unless under medical advice, avoid having recruits taking aspirin or medications containing aspirin and other medications, such as Advil, Motrin, Naprosyn, Aleve, Tylenol for headaches, as this may mask headaches.

Develop and utilize a formalized tool for assessing recruits with after any head strike knockdowns during and after Survival and Control Tactics training and documenting assessment results and follow-up.

Due to the concerns for Second Impact Syndrome, recruits who receive head strikes during Survival and Control Tactics training should be immediately removed and evaluated. Using the SCAT, any recruit that demonstrates any listed symptom should be removed from training and immediately evaluated by a physician.

The determination to stop a bout after a head strike should not be based upon the recruit's determination to continue but on objective criteria.

We recommend using the "one-knockdown rule." If a recruit receives a head strike and falls down or is disoriented, the fight is over for the day, and that recruit is immediately sent for medical evaluation.

Document and consistently follow criteria for stopping bouts during Survival and Control Tactics training. The Academy should enforce the rules in a consistent manner. The instructor should ensure that recruits completely understand the meaning and penalties of "Out of Role," "Stop," and/or the use of a whistle. Any student or instructor should be comfortable in issuing this order, and when issued all activity must stop. One of the purposes for boxing in the Academy is to learn emotional control. The recruit who demonstrates the inability to follow commands and learn control requires additional training and should not be allowed to continue uncontrolled behavior. Allowing such a recruit to continue fighting a bout is not only reducing the effectiveness of the training but also increases the likelihood of injuries. After being warned once concerning infractions of rules for engagement, with a

repeated infraction, the fight will be immediately stopped, and the offending recruit provided remedial training and rescheduling of training. Likewise, a recruit who demonstrates the inability to defend him/herself, especially to head strikes, should be removed from training that day, provided remedial training, and rescheduling of training for another day. To do otherwise is to invite serious head injuries.

Require recruits to immediately report any vomiting, behavior changes, trouble with balance, new or worsening headaches, neck stiffness, bloody or clear drainage from ears or nose occurring after bouts.

Formalized and periodic (yearly) training for all Academy instructor staff participating in Survival and Control Tactics training should be provided. This training should include, but not be limited to: reviews of previous training injuries, rules of fighting, suggestions for improvement, and a medical session on the signs and symptoms of head injuries. The medical session should include the detection of concussion, its clinical features, assessment techniques, and principles of safe return to training. An outside vendor with experience in sports-related head injuries should be sought to co-sponsor this training.

A physician trained in sports medicine, with extensive experience of sports-related head injuries, should evaluate all Academy head injuries and provide a return to training medical determination.

Attachment 12

Sport Concussion Assessment Tool (SCAT)

A

This tool represents a standardized method of evaluating people after concussion in sport. This Tool has been produced as part of the Summary and Agreement Statement of the Second International Symposium on Concussion in Sport, Prague 2004

Sports concussion is defined as a complex pathophysiological process affecting the brain, induced by traumatic biomechanical forces. Several common features that incorporate clinical, pathological and biomechanical injury constructs that may be utilized in defining the nature of a concussive head injury include:

1. Concussion may be caused either by a direct blow to the head, face, neck or elsewhere on the body with an 'impulsive' force transmitted to the head.
2. Concussion typically results in the rapid onset of short-lived impairment of neurological function that resolves spontaneously.
3. Concussion may result in neuropathological changes but the acute clinical symptoms largely reflect a functional disturbance rather than structural injury.
4. Concussion results in a graded set of clinical syndromes that may or may not involve loss of consciousness. Resolution of the clinical and cognitive symptoms typically follows a sequential course.
5. Concussion is typically associated with grossly normal structural neuroimaging studies.

Post Concussion Symptoms

Ask the athlete to score themselves based on how they feel now. It is recognized that a low score may be normal for some athletes, but clinical judgment should be exercised to determine if a change in symptoms has occurred following the suspected concussion event.

It should be recognized that the reporting of symptoms may not be entirely reliable. This may be due to the effects of a concussion or because the athlete's passionate desire to return to competition outweighs their natural inclination to give an honest response.

If possible, ask someone who knows the athlete well about changes in affect, personality, behavior, etc.

Remember, concussion should be suspected in the presence of ANY ONE or more of the following:

- Symptoms (such as headache), or
- Signs (such as loss of consciousness), or
- Memory problems

Any athlete with a suspected concussion should be monitored for deterioration (i.e., should not be left alone) and should not drive a motor vehicle.

For more information see the "Summary and Agreement Statement of the Second International Symposium on Concussion in Sport" in the: Clinical Journal of Sport Medicine 2005; xx(xx): xxx-x British Journal of Sports Medicine 2005; xx(xx): xxx-x Neurosurgery 2005; ; xx(xx): xxx-x Physician and Sportsmedicine 2005; xx(xx): xxx-x This tool may be copied for distribution to teams, groups and organizations.



The SCAT Card (Sport Concussion Assessment Tool) Athlete Information

What is a concussion? A concussion is a disturbance in the function of the brain caused by a direct or indirect force to the head. It results in a variety of symptoms (like those listed below) and may, or may not, involve memory problems or loss of consciousness.

How do you feel? You should score yourself on the following symptoms, based on how you feel now.

Post Concussion Symptom Scale

	None	Moderate	Severe				
Headache	0	1	2	3	4	5	6
"Pressure in head"	0	1	2	3	4	5	6
Neck Pain	0	1	2	3	4	5	6
Balance problems or dizzy	0	1	2	3	4	5	6
Nausea or vomiting	0	1	2	3	4	5	6
Vision problems	0	1	2	3	4	5	6
Hearing problems / ringing	0	1	2	3	4	5	6
"Don't feel right"	0	1	2	3	4	5	6
Feeling "dinged" or "dazed"	0	1	2	3	4	5	6
Confusion	0	1	2	3	4	5	6
Feeling slowed down	0	1	2	3	4	5	6
Feeling like "in a fog"	0	1	2	3	4	5	6
Drowsiness	0	1	2	3	4	5	6
Fatigue or low energy	0	1	2	3	4	5	6
More emotional than usual	0	1	2	3	4	5	6
Irritability	0	1	2	3	4	5	6
Difficulty concentrating	0	1	2	3	4	5	6
Difficulty remembering	0	1	2	3	4	5	6

(follow up symptoms only)

Sadness	0	1	2	3	4	5	6
Nervous or Anxious	0	1	2	3	4	5	6
Trouble falling asleep	0	1	2	3	4	5	6
Sleeping more than usual	0	1	2	3	4	5	6
Sensitivity to light	0	1	2	3	4	5	6
Sensitivity to noise	0	1	2	3	4	5	6
Other: _____	0	1	2	3	4	5	6

What should I do?

Any athlete suspected of having a concussion should be removed from play, and then seek medical evaluation.

Signs to watch for:

Problems could arise over the first 24-48 hours. You should not be left alone and must go to a hospital at once if you:




- Have a headache that gets worse
- Are very drowsy or can't be awakened (woken up)
- Can't recognize people or places
- Have repeated vomiting
- Behave unusually or seem confused; are very irritable
- Have seizures (arms and legs jerk uncontrollably)
- Have weak or numb arms or legs
- Are unsteady on your feet; have slurred speech

Remember, it is better to be safe. Consult your doctor after a suspected concussion.

What can I expect?

Concussion typically results in the rapid onset of short-lived impairment that resolves spontaneously over time. You can expect that you will be told to rest until you are fully recovered (that means resting your body and your mind). Then, your doctor will likely advise that you go through a gradual increase in exercise over several days (or longer) before returning to sport.

B

The SCAT Card

(Sport Concussion Assessment Tool)
Medical Evaluation

Name: _____ Date _____

Sport/Team: _____ Mouth guard? Y N

1) SIGNS

Was there loss of consciousness or unresponsiveness? Y N
 Was there seizure or convulsive activity? Y N
 Was there a balance problem / unsteadiness? Y N

2) MEMORY
Modified Maddocks questions (check correct)

At what venue are we? ___; Which half is it? ___; Who scored last? ___

What team did we play last? ___; Did we win last game? ___?

3) SYMPTOM SCORE
 Total number of positive symptoms (from reverse side of the card) = _____

4) COGNITIVE ASSESSMENT

5 word recall

	(Examples)	Immediate	Delayed
		(after concentration tasks)	
Word 1 _____	cat	---	---
Word 2 _____	pen	---	---
Word 3 _____	shoe	---	---
Word 4 _____	book	---	---
Word 5 _____	car	---	---

Months in reverse order:
 Jun-May-Apr-Mar-Feb-Jan-Dec-Nov-Oct-Sep-Aug-Jul (circle incorrect)
or

Digits backwards (check correct)

5-2-8	3-9-1	-----
6-2-9-4	4-3-7-1	-----
8-3-2-7-9	1-4-9-3-6	-----
7-3-9-1-4-2	5-1-8-4-6-8	-----

Ask delayed 5-word recall now

5) NEUROLOGIC SCREENING

	Pass	Fail
Speech	---	---
Eye Motion and Pupils	---	---
Pronator Drift	---	---
Gait Assessment	---	---

Any neurologic screening abnormality necessitates formal neurologic or hospital assessment

6) RETURN TO PLAY

Athletes should not be returned to play the same day of injury. When returning athletes to play, they should follow a stepwise symptom-limited program, with stages of progression. For example:

1. rest until asymptomatic (physical and mental rest)
2. light aerobic exercise (e.g. stationary cycle)
3. sport-specific training
4. non-contact training drills (start light resistance training)
5. full contact training after medical clearance
6. return to competition (game play)

There should be approximately 24 hours (or longer) for each stage and the athlete should return to stage 1 if symptoms recur. Resistance training should only be added in the later stages. Medical clearance should be given before return to play.

Instructions:
 This side of the card is for the use of medical doctors, physiotherapists or athletic therapists. In order to maximize the information gathered from the card, it is strongly suggested that all athletes participating in contact sports complete a baseline evaluation prior to the beginning of their competitive season. This card is a suggested guide only for sports concussion and is not meant to assess more severe forms of brain injury. **Please give a COPY of this card to the athlete for their information and to guide follow-up assessment.**

Signs:
 Assess for each of these items and circle Y (yes) or N (no).

Memory:
 Select any 5 words (an example is given). Avoid choosing related words such as "dark" and "moon" which can be recalled by means of word association. Read each word at a rate of one word per second. The athlete should not be informed of the delayed testing of memory (to be done after the reverse months and/or digits). Choose a different set of words each time you perform a follow-up exam with the same candidate.

Concentration / Attention:
 Ask the athlete to recite the months of the year in reverse order, starting with a random month. Do not start with December or January. Circle any months not recited in the correct sequence.

For digits backwards, if correct, go to the next string length. If incorrect, read trial 2. Stop after incorrect on both trials.

Neurologic Screening:
 Trained medical personnel must administer this examination. These individuals might include medical doctors, physiotherapists or athletic therapists. Speech should be assessed for fluency and lack of slurring. Eye motion should reveal no diplopia in any of the 4 planes of movement (vertical, horizontal and both diagonal planes). The pronator drift is performed by asking the patient to hold both arms in front of them, palms up, with eyes closed. A positive test is pronating the forearm, dropping the arm, or drift away from midline. For gait assessment, ask the patient to walk away from you, turn and walk back.

Return to Play:
 A structured, graded exertion protocol should be developed; individualized on the basis of sport, age and the concussion history of the athlete. Exercise or training should be commenced only after the athlete is clearly asymptomatic with physical and cognitive rest. Final decision for clearance to return to competition should ideally be made by a medical doctor.

For more information see the "Summary and Agreement Statement of the Second International Symposium on Concussion in Sport" in the: *Clinical Journal of Sport Medicine* 2005; in press *British Journal of Sports Medicine* 2005; **39**:196-204 *Neurosurgery* 2005; in press *Physician and Sportsmedicine* 2005; in press

Attachment 13

References

American College of Sports Medicine. ACSM's Guidelines for Exercise Testing and Prescription. 7th Edition. Lippincott Williams & Wilkins;2006.

Bernhardt DT. Concussion. <http://www.emedicine.com/sports/topic27.htm>. 7/22/04, accessed 2/16/06.

Collins MW, Lovell MR, Mckeag DB. Current Issues in Managing Sports-Related Concussion. JAMA 1999;282(24):2283.

Hessl SM, Miller RJ. Law Enforcement Worker Health. Clinics in Occupational and Environmental Medicine 2003;3(3).

Kelly JP. Traumatic Brain Injury and Concussion in Sports. JAMA 1999;282(10):989.

Maron BJ, et. al. 36th Bethesda Conference: Eligibility Recommendations for Competitive Athletes with Cardiovascular Abnormalities. Journal of the American College of Cardiology 2005;45(8).

Maron BJ, et. al. Recommendations for Preparticipation Screening and the Assessment of Cardiovascular Disease in Masters Athletes: An Advisory for Healthcare Professionals from the Working Groups of the World Heart Federation, the International Federation of Sports Medicine, and the American Heart Association Committee on Exercise, Cardiac Rehabilitation, and Prevention. Circulation 2001;103:327-34.

McCrary PR, KM Johnston KM. Acute Clinical Symptoms of Concussion. The Physician and Sportsmedicine 2002;30(8).

McCrary P, et. al. Summary and Agreement Statement of the 2nd International Conference on Concussion in Sport, Prague 2004. Clinical Journal of Sport Medicine 2005;15(2).

McKeag DB. Understanding Sports-Related Concussion: Coming Into Focus but Still Fuzzy. JAMA 2003;290(19):2604-5.

Messina P. Confrontational Simulation Training – Part 1. The Police Marksman, November/December 2004.

Messina P. Confrontational Simulation Training – Part 2. The Police Marksman, January/February 2005.

Messina P. Confrontational Simulation Training – Part 3. The Police Marksman, March/April 2005.

Messina P. Confrontational Simulation Training – Part 4. The Police Marksman, May/June 2005.

Messina P, Czarnecki F. Martial Arts for Cops, The Dark Side: Fist of Frenzy. The Police Marksman, January/February 2002.

Moore C. Is You Training Enough? Law Enforcement Technology, August 2004.

Moore C. Safe Training Is No Accident. Law Enforcement Technology, November 2004.

National High Blood Pressure Education Program. Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC 7). National Institutes of Health; 2003.

Training Accident Investigation Team: United States Border Patrol Boxing Head Injury. Federal Law Enforcement Training Center, Department of the Treasury; 2002.

Okin PM. Electrocardiography in Women: Taking the Initiative. Circulation 2006;113:464-6.

Winkle J. Boxing as Combatives Training: The Good, The Bad, & The Ugly (unknown date).