Abstract

Concurrent Session 1A: Combat Medicine and Traumatology

Philippe Sockeel

Colonel Dr Philippe Sockeel was born in 1966 at Soissons, France. He gained his medical degree from the Military Medical Academy of Lyon in 1994. Following graduation, Dr Sockeel had been deployed in several positions throughout the French Military and overseas including Deputy Surgeon of the 12th Artillery Regiment in Oberhoffen, Germany; Deputy Surgeon of the French Bat of FORPRONU in Sarajevo; Deputy Surgeon of the Éléments Français en Afrique de l’Ouest (EFAO) in Western Africa; Deputy Surgeon of the Groupement d’Intervention de la Gendarmerie Nationale (GIGN); Assistant in visceral surgery in Le Val de Grâce Military Hospital, Paris; Deputy Chief in the Department of General and Digestive Surgery at the Military Hospital LEGOUEST, Metz, France; Visceral Surgeon, Franco-German Medico-Surgical Group of Kabul in Afghanistan and as the Visceral Surgeon, Medico-Surgical Group of Plana, Kosovo. Currently, he is the Chief of the Department of General and Digestive Surgery, Military Hospital LEGOUEST, Metz.

Anjum Anwar Qadri

Lt. Col. Anjum Anwar is the Assistant Professor of Anesthesiology of CMH Lahore Medical College. He is also the Consultant and Head of Anesthesiology Department of Hand and Upper Limb Surgery Center of Lahore, Pakistan. His academic qualifications are MBBS, Dip. In Anesthesia, MCPS and FCPS. He has a few papers and publications published. He has presented two papers in a conference and symposium one in each respectively. Lt. Col. Anjum was awarded UN Force Commanders Commendation Certificate for rendering extraordinary medical services he provided between 2006 to 2007.

OP1

Main Gate Syndrome – A New Format in Mass-Casualty Victim ‘Surge’ Management

Philippe Sockeel 1, Marie Pauline Massoure 1, Thomas Schilling 1, Kevin Fixot 1, Charlotte de Saint Roman 1 & Thierry Steiner 1

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Introduction: Recent explosion of suicide bombers introduced new and unique profile of massive casualties for NATO Role 2 and 3 on modern operation theatres.

Methods: Data were collected at the French-German Role 2 in Afghanistan during the week of terror in February 2007.

Results: 14 casualties were included; all had the first surgical triage in US Role 2 before evacuation. A second surgical management was performed with systematic ultrasound examination. 4 cases required emergency surgical procedure.

Conclusion: The main gate syndrome by suicide bombing in crowded location near the evacuation hospital outstretched the medical resources. We introduced a novel concept of semi-evacuation hospital where a new triage is performed. Specific injuries require tailored approaches, an open mind, and close collaboration between trauma surgeons and anaesthetists. In the event of mass casualties mobility, reproducibility and quick results made emergency ultrasound exam a valuable and effective tool.

OP2

Profile of Injuries Arising from the 2005 Kashmir Earthquake: The First 72 Hour

Jamin Mulvey 1, Saif Awam 1, Anjum Anwar Qadri 1 & Muhammad Maqsood 1

1 Pakistan Army, PAKISTAN

Background: The Kashmir Earthquake of October 8, 2005 had widespread destructive effects within excess of 86,000 people killed and over 80,000 severely injured. Most hospitals were destroyed and limited facilities were available for medical service in the immediate aftermath. A small military hospital in Forward Kahuta, Pakistan, remained functional and was inundated with severely injured patients over the period of 72 hours.

Methods: A retrospective review of medical records to document the injury patterns, subsequent treatment, infections and logistical requirements that occurred following this earthquake.

Results: One thousand five hundred and two patients were triaged over 72 hour. Four hundred and sixty eight (31.1%) patients required admission. Three hundred and nineteen (68.2%) patients were managed non-operatively and 149 (31.8%) required a procedure under general anaesthesia. The most common type of injuries were: superficial lacerations (64.9%); fractures (22.2%); and soft tissue contusions/sprains (5.9%). There were 266 major injuries to the extremities (40.1% upper limb; 59.9% lower limb). Six patients had significant abdominal injuries, 66.6% of these required urgent laparotomy. 14.8% had clinically relevant infections at follow-up requiring surgical debridement or antibiotic therapy.

Conclusions: Disaster response in the early phase of earthquake relief is complex, with local facilities often overwhelmed and damaged. Limb injuries are most likely; however facilities should have clear plans to deal with severe trauma including head injuries and penetrating abdominal trauma. Coordinated effort is required for success, with lessons learnt to improve future disaster management.
OP4
EARLY INFECTIOUS COMPLICATIONS OF CRANIOCEREBRAL GUNSHOT WOUNDS

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1 Clinic of Neurosurgery, Military Medical Academy, Saint Petersburg, RUSSIA

There were 761 casualties, killed during local military conflicts on the territory of the Northern Caucasus in 1995-2001. We carried out statistical processing of protocols of their postmortem examination. The structure of early intracranial pyo-infectious complications in combat skull wounds was as follows: meningitis – up to 27%, meningoencephalitis – up to 43%, abscesses – up to 27%, ventriculitis – up to 11%, marginal osteomyelitis of the skull bones – up to 8%. It should be mentioned, that leukocytic infiltration in a gunshot wound, seen in all cases, confirms development of local “gunshot” encephalitis, as a response to injury. Local “gunshot” encephalitis, diagnosed on CT-examination, pleocytosis up to 500 cells in 1 ml against a background of massive subarachnoid hemorrhage, presence of crush foc in a stable state of a patient and absence of signs of general infectious intoxication are common phenomena in a course of a wound disease and cannot be regarded as a pyo-infectious complication. We analyzed two types of infectious intracranial complications, which determined a clinical picture of a gunshot wound: those, developing extremely rapidly (within 48 hours) and early complications, which developed within 3-14 days. Gunshot penetrating wounds with development of a leading syndrome, manifesting itself in extremely rapid forms of meningitis and meningoencephalitis, were rather rare (5%). However, their rapid development, a course severity and high mortality were of particular importance. Factors, increasing a risk of development of purulent complications in gunshot wounds of the skull and brain included multiple intracranial wounds, a greater volume of non-viable tissues due to a damaging effect of new types of weapons and frontalbase wounds with injured accessory sinuses. A penetrating wound in the skull base area with injured pumatic cavities was the main condition for development of this type of complication. As a rule, it was represented by anterior parabasal craniofacial wounds with injured accessory sinuses (cells of the ethmoidal labyrinth, frontal, sphenoidal and maxillary sinuses). Such wounds were associated with penetration of small bone fragments into the skull cavity. These fragments together with cerebral detritus and presence of communication with the environment created favorable conditions for development of pyo-infectious complications. In the majority of cases development of infectious intracranial complications was conditioned by unqualified debridement of a craniocerebral wound (up to non-removal of accessible bone or missile fragments), long-term evacuation, its multi-stage character, absence of full-value antibacterial therapy. Our analysis of developing infectious complications has confirmed a thesis, according to which a rate of wound infection is determined not only by a character of craniocerebral injuries, but also by a quality of surgical debridement and efficacy of postoperative treatment. Operation time and its part in preventing infectious complications is much less important than a volume and quality of surgical care, purposefulness and duration of postoperative treatment just on the spot.
Lotfi Nouisri

Colonel (Dr) Lotfi is a Professor with a Medical Doctorate in Orthopaedic Surgery from Tunisia. He attended the Medical School of Tunis in 1986, then proceeded to train in General Surgery and finally in Orthopaedic Surgery in Tunis, Paris (France) and Fribourg (Switzerland). In 1998, he was appointed Associate Professor, then as Professor in 2006. Since 2003, he is the Head of the Department of Orthopaedic Surgery at the Military Hospital of Tunis. He has special interest in arthroscopy; replacement surgery of hip and knee; shoulder surgery and sports injuries. He serves as the Associate Editor for la revue Tunisienne de la Sante Militaire (RTSM) and is a member of International Editorial Board of the Revue of the Association of the Military Surgeon of the United States (AMSUS).

OP5

ASPECTS OF CURRENT MANAGEMENT : INTERDISCIPLINARY SURGICAL PRIORITIES IN DAMAGE CONTROL FOR POLYTRAUMA PATIENT

Lotfi Nouisri, 1 Sonia Benzarti 2 & Mohammed Karrel Chebbi 3
1 Department’s Chief of Orthopaedic Surgery – Military Hospital – 1008 TUNISIA
2 E.N.T Department – Military Hospital – 1008 TUNISIA
3 General Director of Health Services – TUNISIA

DCO is a spin-off term from Damage Control Surgery which is popular in Abdominal Surgery. It is based on the prediction that certain patients with multiple injury are “too sick” to have their long bone fractures stabilized with intramedullary nails or plate. Instead, it is recommended that they have their fractures, particularly those of the femur, stabilized with an external fixation device and than have a secondary intramedullary nail. The authors use the MOF to indicate Multiple Organ Failure, ETC to indicate Early Total Care, 1st IMN to indicate IntraMedullary Nailing of the femur on first intention and 1st EF for external fixation (or sometimes 1st EF, 2nd IMN) to indicate those patients treated with “damage control”.

A similar distribution occurred regarding the incidence of MOF and ARDS (Acute Respiratory Distress Syndrome)

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<td>N 69</td>
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<tr>
<td>1st IMN</td>
<td>41</td>
<td>17</td>
<td>89</td>
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<tr>
<td>1st EF</td>
<td>2</td>
<td>10</td>
<td>7</td>
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<tr>
<td>EF then IMN</td>
<td>0.03%</td>
<td>43.1%</td>
<td>7.1%</td>
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<tr>
<td>Plate</td>
<td>23</td>
<td>9</td>
<td>2</td>
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<tr>
<td>Coagulopathy</td>
<td>34.8%</td>
<td>5.18%</td>
<td>0.02%</td>
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The period 1999–2008 was characterized by using Nailing in first intention to stabilize fractures specially long bones even in case of Multiple Organ Failure using undreamed nail to decrease the risk of fat embolism fat accident. We discuss the current literature on using first intramedullary nailing in polytrauma patients referring to some clinical cases. We concluded that as soon as the patient has been stabilized and any coagulopathy reversed, early intramedullary nailing specially without reaming should be performed.

MIGUEL A. CUBANO

Capt. Miguel Cubano is a surgeon who earned his Doctor of Medicine degree from the Ponce School of Medicine in Puerto Rico in 1988. He has Fellowship in Surgical Nutrition and Critical Care from John Hopkins Hospital. He founded and directed the first US Navy Bariatric Surgery Program to treat morbid obesity. Capt. Cubano was the first Naval Officer to ever fill the position as Admiral Stavridis to serve as the US SOUTHCOM Command Surgeon. He has received numerous prestigious awards and he is the youngest physician to ever receive the Puerto Rican Physician of the Year Award by the American Medical Association (AMA). Lastly but not least, he has both his fixed wing and rotary wing license and is an avid part-time aviator.

OP6

FORWARD RESUSCITATIVE SURGICAL SYSTEM IN REAL COMBAT

Miguel A. Cubano
United States Navy, Medical Corps, UNITED STATES OF AMERICA.

Background: Medical care in the battlefield has experienced significant transformation to a more rapidly deployed unit capable of providing timely surgical intervention to severely injured combat casualties. The nonlinear nature of modern conflicts with the unpredictable terrain and weather patterns dictated the need for surgical units close to the front line in order to reduce the time from wounding to surgical care. The US Marine Corps (USMC) developed the Forward Resuscitative Surgical System (FRSS) to include 8-man team. The FRSS is capable to be functional within one hour, and performed 16 major operative procedures within 48 hours. This report showcases the experience of the FRSS teams used to support USMC combat units during Operation Iraqi Freedom (OIF).

Methods: Initially six FRSS where collected with Shock Trauma Platoons (STPs) during the formal combat phase of OIF. The casualties were initially triaged by the STPs; those requiring surgical intervention were transferred immediately to the FRSS. Postoperatively, patients were transported as soon as possible to the next level care. Data was collected in a prospective fashion.

Results: We will report data related to the initial involvement of the FRSS as well as the subsequent impact of this approach in the overall morbidity and mortality. Of the 90 casualties seen from March to April of 2003, 21 patients were considered critical by GCS<8, airway or respiratory compromise, or class III or greater hemorrhagic shock. The average ISS was 21 (range 9-41) and the median time between wounding and reaching the FRSS was 30 minutes (range 15-120)

Conclusion: The proximity of the FRSS to the point of injury clearly showed a decrease in the amount of time from injury to surgical intervention, not only improving survival but also overall patient outcomes.
E. Hornez Emmanuel

Major Hornez is a Surgeon by occupation with a Medical Doctorate from University of Lyon. He is the Assistant of Military Hospitals, Department of Visceral Surgery, Armed Forces Hospital of Toulon, France. He has numerous scientific publications, has one poster done in 2008 and has two oral presentations. Major Hornez received the Bronze Medal Award of National Defence for Armed Forces Medical Service in 2001.

OP7
MANAGEMENT OF THE ACUTE APPENDECTOMY ONBOARD FRENCH NUCLEAR SUBMARINES: IS THE EMERGENCY APPENDECTOMY STILL JUSTIFIED IN 2009

Hornez Emmanuel 1; Gellie Gabriel 2; Monchal Tristan 1; Meusnier François 1; Platel Jean-Philippe 1; De Carbonnieres Hubert 2 & Thouard Hervé 1
1 Health Service of the Armies, Department of Surgery, Sainte Anne Military Hospital, BP 20545, 83041 Toulon Cedex, France.
2 Health Service of the Armies, Nuclear Submarine Medical Center, BP100, 83800 Toulon Cedex 09, FRANCE.

Acute appendicitis is a common disease during nuclear submarines patrol. The management on board is specific and must meet 2 requirements: not to endanger the life of the seaman and not to compromise the mission of nuclear deterrence by a medical evacuation. Considering these parameters, the usual treatment for all cases of appendiceal masses on board French nuclear submarines, including both appendicitis and appendiceal abscess, is an emergency appendectomy. This appendectomy is performed onboard by the medical officer without interrupting the patrol. In the past 15 years many studies show that nonoperative treatment is an alternative approach to treat acute appendicitis. Based on an intravenous bi-antibiotic therapy, its efficacy is estimated at 83%. However this non-operative management remains non to be recommended in civilian practice. On board French nuclear submarines, the management of complications of the non-operative treatment failure (sepsis, peritonitis) would be difficult and the surgical treatment is still recommended. These recommendations are different for acute appendicitis complicated with an appendiceal abscess. The morbidity of the surgical treatment is increased while the nonsurgical treatment, based on intravenous administration of antibiotics, is successful in about 93% of the patients. Failure of nonsurgical treatment is a reliable indication of percutaneous drainage in 27% of the patient. This drainage is performed onboard by the medical officer with an ultrasonographic guidance. Considering that the on-board surgical facility is limited, nonsurgical treatment appears to be the best approach for treating a sailor with an appendiceal abscess.

Wang En Pu

Professor Dr Wang En Pu is currently the Chief Physician and Director, Department of Ophthalmology in the Armed Forces General Hospital. He graduated with a medical degree from The 4th Military Medical University. He is also a visiting scholar to the Zhongshan Eye Center in Guangzhou, China and North American Gimbel Eye Center in Canada. He is a member of the award review board on medical matters in the PLA and Standing Committee of the Ophthalmologic Council. He is also the Head of the Ophthalmology council committee and Continuing Medical Education of the CHINA Air Force. He is also the editor of the Chinese Journal of Aerospace Medicine. His main research interests are mostly related to eye conditions in the field of Aeromedicine and refractive corneal surgery. Professor Wang has published more than 30 research papers in international and local journals. He also has written 3 books and has been bestowed several awards by the PLA for his work in Ophthalmology.

OP8
RETROSPECTIVE ANALYSIS OF OCULAR INJURY IN AVIATORS

Wang En Pu 1 & Zhao Rong 1
1 Department of Ophthalmology, General Hospital of Air Force, Beijing, CHINA

Objective: To investigate the characteristic of primary or suspected glaucoma among hospitalized military pilots.

Methods: Medical files of 95 pilots hospitalized due to glaucoma/suspected glaucoma were reviewed.

Results: Fifty-six cases were diagnosed as primary open-angle glaucoma (POAG), the number of flying disqualification was fifteen, three cases were suspected, thirty-eight cases were qualified with permitted to fly during 126 (6.36±1.43) years; Pilots with suspected glaucoma were examined with standard glaucomatous procedure. Thirty-three cases were normal, three were suspected cases of glaucoma, the fly conclusion was indistinct. Three cases with ocular hypertension were qualified.

Conclusion: The most common glaucoma type was POAG in Chinese pilots. Most POAG cases with stabilized vision function were qualified in careful observation. The key to control disease was to diagnose early and treat appropriately.
**ABSTRACT**

**CONCURRENT SESSION 1B : FORCE HEALTH PROTECTION**

**Kamen Kanev**

Colonel (Rtd) Associate Professor Kamen Petrov Kanev, MD, PhD, DSc is currently the Head and Chair in Disaster Medicine and Toxicology, Military Medical Academy (MMA) of BULGARIA. He has multiple specialties including Toxicology, Internal Diseases and Emergency Medicine. Professor Kanev has over 150 scientific articles published in Bulgarian and foreign journals, 10 books and 3 handbooks. He has also presented and attended numerous international congresses and meetings. He is also a member of several professional bodies including Secretary of the Specialized Scientific Council of Military Medicine, Bulgaria; Secretary of the Scientific Journal “Military Medicine” and Vice President of the National Bulgarian Association for Reserved Officers. During his career, Professor Kanev has held various positions including Deputy-Head of Department of Medical Control at the Ministry of Defense; Head of Department of Medical Control at Ministry of Defense; Associate Professor In Toxicology; Head of Department of Internal Diseases; Deputy-Director of Governmental Hospital “Lozenec”; Head of Department of Public Health at District Health Center-Sofia and as an Associate Professor in the Faculty of Emergency and Intensive Medicine, Military Medical Academy, Sofia.

**Young Sammy Choi**

Dr. Sammy Y. Choi MD, FAAP, FACP is a graduate of the University of Oklahoma School of Medicine. He completed a combined Internal Medicine/Pediatrics residency at William Beaumont Army Medical Center, Fort Bliss, Texas. For the last 20 years, he has been at Womack Army Medical Center, Fort Bragg, North Carolina where he currently serves as the Director, Department of Research. He additionally serves as a consultant to the Departments of Family Medicine, Medicine, Pediatrics and Perinatology. His clinical areas of interest are metabolic diseases, resuscitation medicine, and educational paradigms. He serves as the Regional Faculty for the American Heart Association for all advanced life support courses and additionally directs the Womack Grand Rounds series.

Dr. Choi is an avid educator and homeschooling father. He has faculty appointments at several universities to include Duke University School of Medicine and the Uniformed Services University of the Health Sciences at Bethesda. He also holds several professional board memberships, received numerous awards nationally and has published numerous research papers. He has been involved in clinical practice guideline projects for the Department of Defense, the Veterans Health Affairs and the American Heart Association. Dr. Choi is active in his community serving on several boards. He has been married for 28 years and has 8 children and one grandchild.

**OP1**

**MEDICAL ASPECTS OF MILITARY MISSION IN AFGHANISTAN**

Kamen Kanev 1, Stoyan Tonev 1 & Krum Katzarov 1  
1 Military Medical Academy, Sofia, BULGARIA

Since the end of the Cold War and the onset of the Global War on Terrorism, there has been significant changes in the way military conduct operations. The main focus for these operations is to provide conflict reduction efforts, improve the security environment, defeat terrorist activity, and provide support in crisis response. According to the Bulgarian military doctrine the types of peace-keeping operations are as follows: peace-preserving, conflict prevention, peace-making, peace-enforcement; peace-building, humanitarian operations. The aim of the article is to present the required analyses concerning host nation healthcare system in the military medical assessment of deployed Bulgarian contingent area of responsibility in Afghanistan. The missions include non-traditional military operations, such as humanitarian assistance and disaster relief, training of local militaries and to conduct training, and medical conduct. The medical aspects of military mission are important element of proper planning and organization of military operation. The main risk factors and recommendations for preserving the health of the troops and local residents are discussed. In conclusion host nation healthcare assessment is crucial for a proper military mission abroad medical support. Health care system in Afghanistan does not meet the European and American standards for medical services which is strongly dependent on foreign assistance.

**OP2**

**SAFE DEPLOYMENT OF TYPE 1 DIABETICS MILITARY PERSONNEL**

Young Sammy Choi  
Womack Army Medical Center, UNITED STATES OF AMERICA.

Type 1 diabetes was previously considered incompatible with military deployment. Such reservations were justified because it was rare to find a physician in the deployment zone who felt comfortable with its management. Furthermore, the dangers of hypoglycemia were felt too hazardous to overcome. For these reasons, most type 1 diabetic soldiers though highly qualified were typically found unfit for military deployment. With the advent of new technology, most soldiers can now be successfully deployed to various theaters of operation. Continuous glucose monitoring systems (CGMS) provide real time glucose assessment every 5 minutes and give audible and/or silent alarms for values exceeding the acceptable range. Alarms for rates of change that exceed a set threshold are also available. Thus, soldiers can now be armed with an early detection system that prevents hypoglycemia. Modern insulin pumps provide multiple basal rates in increments of 0.025-0.050 units per hour. For correction boluses, glucose values from a handheld monitor can be transmitted by radiofrequency to the pump and a bolus is automatically given based on personalized settings. A safety feature prevents inadvertent “insulin stacking” by use of an algorithm that adjusts the amount of insulin given according to the amount of active insulin left from the previous correction bolus. For meal boluses, the grams of carbohydrate to be consumed are entered into the pump which automatically delivers the correct amount of insulin, again based on personalized settings. Perhaps the greatest advance in deployment health is the ability to electronically transfer complete databases to a remote site specialist who can adjust treatment as needed. Such transfer can occur via an attached file or connection to a web-based program. All data from a CGMS, insulin pump, or glucose meter can be easily transmitted and includes glucose values, insulin dosages, timing of insulin administration and the amount of carbohydrate ingested. In summary, technological advances allow the military to safely deploy highly skilled diabetic soldiers to theaters of operation.
Atba Be Atba Soraya

**OP3**

**THROMBOLYSIS IN ACUTE MYOCARDIAL INFARCTION: EXPERIENCE OF INTENSIVE CARE UNIT IN THE CENTRAL HOSPITAL OF ARMY**

Atba Be Atba Soraya 1 & Bendjelloul Abdelkade 1

1 Hospital Central De L’Armee, ALGERIA

Introduction: Thrombolytic therapy has been established as a safe and effective therapy strategy in acute myocardial infarction. The aim of this study was to appreciate the efficacy of thrombolytic therapy in acute myocardial infarction among Algerian military personnel and compare thrombolytic regimens with standard treatment.

Subjects and Methods: The prospective study had included 174 subjects who were admitted for acute myocardial infarction, between January 2001 and December 2003. The subjects were divided into two groups. The first group had included the subjects who did not benefit from thrombolytic therapy, the delay of treatment was upper six hours (48 subjects) and the second group included the subjects who benefitted from thrombolytic therapy. The youngest subject was 18 years old and the oldest was 76. The efficacy of thrombolytic therapy was evaluated in per thrombolysis, at 24 hours, 3 days and 30 days in post thrombolysis. Risk factors, secondary effects of the thrombolytic therapy (hemorrhage ++++) and hospital mortality were analysed.

Results: The clinic and electrocardiographic analysis watched less immediate and distant complications among thrombolysis patients with a benefit for actilyse associated with heparin and aspirin. Two patients were dead, one by a diffuse hemorrhagic syndrome and the second by hemorrhagic stroke.

Conclusions: Thrombolytic therapy in acute myocardial infarction appears to be an effective therapy when used with appropriate indications.

Flottenarzt Stefan Lenz

Flottenarzt Dr. Lenz is the Head of Department, Department of General, Abdominal, Thoracic, Vascular, Hand and Aesthetic Surgery German Army Hospital Berlin.

**OP4**

**CHANGES IN MILITARY SPECIFIC PARAMETERS OF SEVERELY OBESE SOLDIERS WITH DIABETES TYPE II AFTER LAPAROSCOPIC BARIATRIC SURGERY**

Flottenarzt Stefan Lenz

Deutsche Bundeswehr, GERMANY

Overweight and obesity is growing worldwide, causing endocrine and cardiovascular complications and adding financial burden to the health care systems, reducing quality of life and life expectancy. The growing number of obese individuals is associated with high prevalence of diabetes Type II. Severely obese soldiers with Diabetes Type II are an increasing challenge for the Bundeswehr Medical Service. The Bundeswehr Hospital of Berlin introduced metabolic surgery for treatment of obese soldiers using interdisciplinary collaboration. In recently diagnosed Diabetes Type II in obese patients, surgery can improve or even cure the metabolic disease.
Andreja Naumovski

OP5
FORCE HEALTH PROTECTION ON MISSIONS ABROAD

Andreja Naumovski 1 & Sasho Stojove 1
1 Republic of Macedonia

Force health protection of the troops on missions abroad is of ultimate importance for success of the missions. Medical support for a unit battle group, or brigade size, has to be provided by Role-2 field hospital. Size, medical equipment, provisions, medical personnel and specialties within the field hospital are mission-tailored. It depends from the operational situation on the ground, task of the military unit, availability and reliability of neighbouring field hospitals, need of medical care for the civilians, and particularly children. Maintaining of the 60 personnel field hospital requires pool with minimum of 240 personnel on stand by. This means, a use of reserve forces and additional training and education, which prolongs pre-deployment period. During the planning process another challenge is to decide what is more efficient solution for a field hospital: tents, containers, combination of both or a concrete building? For small countries preparation of the field hospital is a big challenge. Limited financial resources, limited pool of military medical personnel, lack of surgical teams particularly, followed with the difficulties with timely replacement of the broken equipment imposes multinational solutions.

Muhamad Muslim Tasdik

En. Muhamad Muslim Tasdik is a Research Officer in Instrumentation & Electronics Technology Division of Science & Technology Research Institute for Defence (STRIDE). He obtained his degree in Physics in 1990 and Masters in Social Science (Defence Studies) in 2006. He has involved in research and development in military electronics application for the past 15 years. His research focus is in the field of electro-optics technology including night vision devices and thermal imager. He also obtained a certification from ITC FLIR Sweden as IR Thermographer Level II in 2008.

OP6
MASS BLIND SCREENING FOR FEVER USING THERMAL IMAGER: STRIDE’S EXPERTISE AND EXPERIENCES.

Abdul Ghaffar Ramli 1, Wan Salwa Wan Hassan 1, Muhamad Muslim Tasdik 1, Mohammad Shahrin Shahrain 1 & Dinesh Sathyamoorthy 1
1 Science and Technology Research Institute for Defence (STRIDE), Ministry of Defence, MALAYSIA

Influenza A(H1N1) was recently declared by World Health Organization (WHO) as global pandemic outbreak category 6. In the early days of concern when WHO declared a category 3, the Malaysian Government, through the Ministry of Health, conducted temperature screening of passengers from selected countries using ear thermometry. The ministry had called for the use of thermal camera to speed up the process, but none was readily available. STRIDE proposed to initiate the thermal scanning using FLIR SC3000 camera, a research instrument with a cooled QWIP detector. Infrared thermal imaging is a non-contact real-time system giving reliable and fast temperature measurement. These capabilities fulfil the operational requirement in detecting potential influenza A(HIN1) carrier in a large group of people. However, system parameters need to be set up appropriately for this technology to be reliable and effective. STRIDE conducted initial laboratory measurements on 21 non-febrile subjects to determine the correlation between forehead skin temperature measured through the thermal camera, and core-body temperature measured through ear thermometry. This procedure enabled equipment settings to be applied during blind fever screening at KLIA to be set a threshold of 37.5 °C equivalent core-body temperature, a value determined by Health authorities to be on set of mild fever. It was found that an estimated 16% of healthy subjects were above this threshold, verified by statistical record kept throughout the operation, which was anticipated. This paper also compares the use of other thermal camera, which can promise affordable system for routine blind fever screening in public places.
Colonel Associate Professor Krum Sofirov Katzarov MD, PhD, is a Gastroenterology and Hepatology specialist, having completed this training in 1993 and Internal Medicine in 1989. He has also attended several specialist courses including training in Military Medicine and Diploma in Medicine. He started his career in the military as the Head of the Military Medical Service at LF Battalion, Senior Assistant at the Gastroenterology and Hepatology clinic, Head of the Gastroenterology and Hepatology Clinic and currently as the Vice President of MMA Education and Research Activities. Professor Katzarov has more than 60 publications in the field of Gastroenterology and Hepatology and has memberships with several professional bodies including the International Association of Gastroenterology, International Association of Surgery & Gastroenterology, The European Association for the Study of the Liver (EASL), Bulgarian Medical Association, Secretary of the Bulgarian Gastro-Surgical Club.

OP7
RECOMMENDATIONS FOR BULGARIAN SERVICEMEN HEALTH PROTECTION DURING INTERNATIONAL PEACEKEEPING OPERATIONS
Krum Katzarov 1, Kamen Kanev 1, Stoyan Tonev 1 & Evgeni Belokonski 1
1 Military Medical Academy, Sofia, BULGARIA

Nowadays in Republic of Bulgaria, as a result of globalization, ongoing process of reforms in the healthcare system and in the military medicine is observed. The reforms in both civilian and military medicine are performed simultaneously in our country, not separately as was in most of the NATO countries. The aim of this study is to summarize the Bulgarian experience in missions abroad and analyze the learned lessons. For more than 100 years Bulgaria has been performing military missions abroad. The latest ones are in the Republic of Iraq, Islamic Republic of Afghanistan and State of Kuwait. All the missions are performed in background Bulgarian servicemen are not used to. In conclusion, it has to be emphasized that on basis of the lessons learned from the various humanitarian and peacekeeping missions Bulgarian Armed Forces Medical Service was involved in and after thorough performed analyses of Afghanistan, Iraq and Kuwait specific features, highly qualified and experienced medical teams have prepared Recommendations for preserving servicemen health during missions abroad (humanitarian, peacekeeping) execution, as well as Unified medical record card in case of disasters.
ABSTRACT

CONCURRENT SESSION 1C : AVIATION AND AEROSPACE MEDICINE

Mohammad Razin Kamarulzaman

Colonel (Dr) Mohammad Razin Kamarul Zaman is currently the Head of Aviation Health in the Institute of Aviation Medicine of the Royal Malaysian Air Force (RMAF). He obtained his MBCh(NUI) in 1995 and pursued his studies in Diploma of Aviation Medicine in United Kingdom. His main interest is in Aerospace Medicine and was involved as a panel member of Malaysian Angkasawan Medical selection to select the first astronaut. He is very active in Aerospace Medical Association and presented several papers in local and international seminars.

Fabio Morgagni

Lieutenant Colonel Fabio Morgagni is Chief of 1° Group High Altitude and Extreme Environments, Aerospace Medicine Department, Italian Air Force Flight Test Center. After graduating in Medicina et Chirurgia from the University of Florence and from the ITAF Medical Academy in 1988, he graduated as a specialist in Pneumonology (1994) and Cardiology (1999) from the University of Milan. Then he graduated from the Italian Air Force Air War College (2005) and from the Italian Joint Services Staff College (2007).

Dr. Morgagni serviced as Head of Medical Unit, 53rd Fighter Wing – Cameri, Chief of Cardiology Department, ITAF Infirmary – Milan, Chief of Pneumonology and Respiratory Physiology, ITAF Aeromedical Institute – Milan, and Chief of Cardiology 1, ITAF Aeromedical Institute – Milan. He completed several duty periods in Balkans and Iraq.

His principal interests are on breathing strategy, ventilatory response to hypoxia and exercise, and cardiac and respiratory adaptations to extreme environments such as high altitude and spaceflight. In these fields, he is the author or co-author of several papers. Dr. Morgagni is qualified as BLS-D executor, PHTLS executor, MIMMS executor and instructor.

OP1
DEVELOPMENT OF ROYAL MALAYSIAN AIRFORCE HIGH PERFORMANCE HUMAN CENTRIFUGE PROJECT

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One of the hazards of flying fast military jets is G-induced loss of consciousness (GLOC), which results in sudden incapacitation and catastrophic accidents. In view of this hazard, the aviation practitioners at the Institute of Aviation Medicine Royal Malaysian Air Force (RMAF) proposed for the procurement of a Human Centrifuge for G-Tolerance training. The RMAF High Performance Human Centrifuge (HPHC) Project was initially drafted out in 1998 during Malaysia’s 7th Five Year Plan. This Development Project was approved in December 2002 through a open tender procurement process. The project was launched in early 2003 and was commissioned in December 2005. It is located in RMAF Subang Air Base and is known as G Simulator Training and Research Centre. It has so far being used as part of the Angkasawan selection process, trained RMAF ab-initio and fighter pilots and also foreign military pilots. The presentation will discuss on the historical background of the centrifuge development, its capabilities, present day utilization and future plans.

OP2
SAFETY OF ALTITUDE CHAMBER TRAINING OPERATIONS IN THE ITALIAN AIR FORCE’S EXPERIENCE

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Altitude chamber is the gold standard for the training on hypoxic and hypobaric environment, and its implementation is mandatory in Italy for military aircrews. Studies have reported several incidents, including barotrauma and decompression sickness, encouraging researches around alternative training tools, like the reduced oxygen breathing devices, although this could negatively affect the training on hypobaria. To minimize the adverse effects of chamber exposure and to avoid the decompression sickness we modified the widely used protocols in order to limit the time spent at altitude and to accurately check the trainees before the session. To evaluate the safety of altitude chamber training in the Italian Air Force experience we reviewed the local database. We trained 1,254 military aircrews and paratroopers from January 2003 to April 2009, and we recorded 32 cases of adverse effects with an overall incidence rate of 2.6%. Decompression Sickness Type I accounted for one case with an incidence rate of 0.08%, not different from reported data. Barotrauma, mainly involving the middle ear, was recorded in nine cases with an incidence rate of 1.5%. We found also four cases of syncope with incidence rate of 0.3%.
Abstract

Concurrent Session 1C: Aviation and Aerospace Medicine

OP3
A PRELIMINARY INVESTIGATION ON THE ROLE OF SPATIAL DISORIENTATION IN FOURTH GENERATION COMBAT AIRCRAFT

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Introduction: Spatial Disorientation (SD) represents one of the major threats in flight safety, especially in military activities. Due to the potentially increased risk of SD related to atypical flight envelopes and to extreme acceleration parameters, fourth generation fighter aircrafts represent an outstanding application field for SD training. The present study aims at analyzing the results obtained in a preliminary brief survey dedicated to various aspects of SD in Italian and Spanish combat pilots operating on the fourth generation Typhoon Eurofighter (EFA).

Subject and Methods: Globally, 29 male pilots from the Italian (18) and Spanish (11) Air Force participated in this study. A brief anonymous questionnaire was administered, which included a specific investigation on several aspects directly or indirectly related to SD onset, training and recovery. A comparison between the incidence of SD before and after the employment on EFA was also performed.

Results: The average number of flight hours on EFA was 245, while on other aircrafts previously flown it was 1232. As expected, most pilots reported the occurrence of SD during their flight career (23 out of 29: 79%). During flight activity on EFA, ten subjects (34%) reported SD episodes and five (17%) the operational use (i.e. not for training purposes) of the “disorientation recovery function”. In only 1 case SD on EFA was not associated to previous episodes in other aircrafts. Additionally, symptoms of simulator sickness were evoked in 3 subjects (10%) during EFA simulator rides.

Conclusion: Although these data should be considered with caution, due to the short duration of the follow up in EFA pilots, a significant role of a specific SD training can be foreseen, dedicated to its demonstration, avoidance and recovery. The observed rate of about 1 SD reported (i.e. recognized) episode/700 flight hrs strongly suggests the development and adoption of countermeasures in EFA operational use. Finally, the possible onset of symptoms of simulator sickness during EFA simulator rides should be taken into account in the flight planning activity.

OP4
SPATIAL DISORIENTATION TRAINING FOR PILOTS: SIMULATION OF SPATIAL DISORIENTATION ACTUAL INCIDENT

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1 Japan

Introduction: Spatial disorientation (SD) remains one of the flight safety problems in the Japan Air Self-Defense Force (JASDF). In JASDF, only aviation cadets undertake the routine SD training using the Spatial Disorientation Trainer (SDT) (Gyrolab™ Model GL-4000). Safe and effective on-ground SD training is a desired countermeasure against SD accidents. However, the training patterns in JASDF have not yet been well-evaluated. Previous reports have suggested that the reproduction of past severe SD accidents or incidents may be more effective for this SD training, particularly for refresher training of experienced pilots. In this study, we re-created the known flight conditions of a past severe SD incident in a Training profile using the Gyrolab and assessed the student’s responses in order to confirm whether this led to more effective SD training.

Methods: Fourteen fighter training pilots (valid responses: 13, age: 27.3±4.9) participated in this study. Subjects experienced the two types of training profiles including; a) typical illusion profiles and b) a replay of an actual severe SD incident. This replay is based on a past severe SD incident we previously reported. In that severe SD incident profile, trainees experienced up to 3Gs with an audio recording of the incident cockpit sounds. The subjects then answered questions about these SD profiles regarding the pilot-evaluated effectiveness and subjective impression with a 5-point scale: 0 (no effectiveness) to 4 (very effective).

Results: The results show that the pilot-evaluated effectiveness of the replayed SD incident profile was 3.9±0.3, the highest value of the all profiles. The score regarding subjective impression for the replayed SD incident profile was also the highest value (4.0±0.3) of the all SD profiles.

Conclusion: These results suggest that SD training patterns based on actual severe SD incidents may be a more effective method for on-ground SD training.
Mohammed Razin Kamarulzaman

Colonel (Dr) Mohammad Razin Kamarul Zaman is currently the Head of Aviation Health in the Institute of Aviation Medicine of the Royal Malaysian Air Force (RMAF). He obtained his MBBC(NUI) in 1995 and pursued his studies in Diploma of Aviation Medicine in United Kingdom. His main interest is in Aerospace Medicine and was involved as a panel member of Malaysian Angkasawan Medical selection to select the first astronaut. He is very active in Aerospace Medical Association and presented several papers in local and international seminars.

Dario Di Blasio

Lieutenant Colonel Dario Di Blasio is the Chief Of Human Factors & Night Vision Group, Aerospace Medicine Department, for the Italian Air Force Flight test Center in Practica di Mare AFB. He also did his residency in Ophthalmology and was appointed as a Specialist in 1992. Lt Col Dario served as the Chief of Medical Unit, Chief of Studies & Programs Section at the Military School of Aviation Health, Chief of ophthalmology Department and Chief of Medical Unit in the Italian Air Force Headquaters Command. He is the main Author of recent study trials such as Changes in Pilots’ Pattern Reversal VEPs, induced by Hypoxemic Hypoxia; Effects of Hypoxemic Hypoxia on Pattern Reversal VEPs; and Adjustment of Ocular Biometric Parameters during Hypobaric Hypoxia. In this fields, he is the author and co-author of several papers.

OP5
ROYAL MALAYSIAN AIR FORCE EJECTION SEAT CASES REVIEW (1984-2004)

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The Royal Malaysian Air Force (RMAF) operate multiple fighter and trainee aircraft types with ejection seat capabilities. The ejection seats are used for emergency egress in situations where the aircraft has departed beyond the normal flight parameters or in severe emergencies. We conducted a retrospective review of aircraft accidents involving ejection seat activation from the year 1984 to 2004 using the RMAF Inspectorate Board of Inquiry documents and aircrew medical records. There were 33 cases recorded involving 24 aircraft accidents. 12% of cases were fatal, 18% sustained major injuries and 70% cases sustained minor injuries. The findings, management and shortcomings of these cases will be presented.

OP6
BIOELECTRIC VISUAL RESPONSE OF RETINOCORTICAL PATHWAYS THROUGH AIDED VISION DEVICES (NIGHT VISION GOGGLES)

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Purpose: Our objective consisted of assessing the extent of the bioelectric visual response variation, using Night Vision Goggles (NVGs), in scotopic environment, compared with conditions of standard environmental luminance. In both circumstances (with/without NVG), the retina is exposed to photopic luminosity, although with different spectral features.

Materials and Methods: As aided vision devices we utilized the latest ANVIS-9 Gen.3 plus NVGs. The trial involved ten, healthy, emmetropic subjects, male (38 ± 5 yrs), flight test center crewmembers, qualified to carry out NVG operations. In order to evaluate their bioelectric response, we made use of a Visual Evoked Potential (VEP) equipment, at 15 and 60 minutes of arc pattern reversal spatial frequency. We used a 19” CRT display, at an observation distance of 573 mm, with an average luminance ratio (B/W) of 60 cd/m2. Afterwards, the screen mean luminance faded from 60 cd/m2 thru 0.119 cd/m2, by the nearly total attenuation of screen in-built luminance control and placing additionally 3 Neutral Density (ND) filters, with high photo-absorption. The same subjects had formerly gone through a VEP pattern reversal analysis, in conditions of standard environmental luminance, in terms of ISCEV procedures.

Results: The analysis of results provided evidence for a significant increase (P < 0.001) of the Latency P-100 wave of 8% and the reduction as significant (P < 0.001) of the P-100 Amplitude of 40%, while using of NVG.

Conclusions: Based on the bioelectric outcomes, Authors suggest that the use of NVG may generate the following effects: (1) Smaller amounts of central photoreceptors recruited, due to the specific wavelength (550 nm) released by NVGs display and produced by the Phosphorus screen (P43), (2) Selective stimulation of nerve fibers, linking to parv / konio systems which, due to their smaller size, have higher impedance to signal transmission.
Zulkeffeli Mat Jusoh

KOL(DR) ZULKIFFELI BIN MAT JUSOH graduated from the Army Medical College Rawalpindi, Pakistan in 1991 and commissioned into the Royal Medical and Dental Corps of the Malaysian Army. He served as the Regiment Medical Officer with the 22 Special Forces Regiment before pursuing his studies in the field of Aerospace Medicine. Currently the Head of Aerophysiology Department at the RMAF Institute of Aviation Medicine Kuala Lumpur, he is responsible for the Aerophysiological training of the military and civilian aircrews and the Authorized Medical Examiner for the Department of Civil Aviation. He was the Program Director and the Mission Flight Surgeon for the first Malaysian Astronaut Program and also the Force Medical Officer for the UN Mission in Western Sahara. He is also the Chief Medical Officer for the Sepang MotoGP and A1 GP of Motorsport Malaysia. His special interest are the Space Medicine and Human Factors in Aviation.

Faiz Khaleed

Major (Dr) Faiz Khaleed is a Dental Surgeon/Astronaut of the Royal Malaysian Armed Forces/Malaysian Space Agency respectively. Dr Faiz obtained his Bachelor Of Dental Surgery from “University Malaya”, Malaysia in 2004. He was commissioned as the Malaysian Armed Forces Dental Officer in 2004. In 2006, he joined the Malaysia’s first Astronaut Program, and out of 11,000 people who participated, he was chosen as the 2nd Astronaut after completing the introductory and basic astronaut training organized by the Russian Space Agency(ROSCOSMOS) in 2007. Dr Faiz also completed Basic Military Paratrooper Training Course and Underwater Medicine Course in 2005.

OP7
MALAYSIAN ANGKASAWAN PROGRAMME

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The Malaysian Angkasawan Program or Space Flight Participant Program was launched in November 2003 as an off-set package from the procurement of Multi-Role Combat Aircraft (MRCA) by the Royal Malaysian Air Force (RMAF) from the Russian Government. The National Space Agency Malaysia (ANGKASA) was tasked to spearhead the Program. The Institute of Aviation Medicine RMAF was given the responsibility to assist ANGKASA in the medical selection process. 11,000 Malaysian citizens registered on-line. The medical selection process was conducted in three phases from August 2005 until January 2006. The first phase consisted of a 3.5km run followed by general medical screening; the second phase consisted aircrew medical and dental examination and the final phase consisted altitude, G-tolerance and survival test. Four final candidates were then examined in Russia before the final two were selected in September 2006. On 10 October 2007, the first Malaysian went on-board the Russian Soyuz and was launched to space and to the International Space Station.

OP8
COSMONAULT TRAINING AND PHYSICAL CHANGES IN MICROGRAVITY ENVIRONMENT

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ANGKASAWAN Project, MALAYSIA

Cosmonaut training is a highly demanding course that requires an individual to be physically and mentally fit. This session will enlighten audiences through the entire training program done in Yuri Gagarin Cosmonaut Training Center, Moscow, Russia. Besides that, topic on physiological changes in microgravity environment also will be discussed.