



**Department of Veterans Affairs
Office of Inspector General**

Healthcare Inspection

**Review of Quality of Care
Department of Veterans Affairs
James A. Haley Medical Center,
Tampa, Florida**

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**DEPARTMENT OF VETERANS AFFAIRS
Office of Inspector General
Washington, DC 20420**

TO: Director, Veterans Integrated Services Network 8 (10N8)

SUBJECT: **Final Report** – Healthcare Inspection – Review of Quality of Care, Department of Veterans Affairs James A. Haley Medical Center, Tampa, Florida – (Report Number: 2005-00641-083)

1. Purpose

The Department of Veterans Affairs (VA) Office of the Inspector General's (OIG) Office of Healthcare Inspections (OHI) was requested by the Secretary of Veterans Affairs to review the care of an active duty marine who was seriously wounded in Iraq, treated initially in Department of Defense (DoD) facilities, and transferred for rehabilitative care to the James A. Haley VA Medical Center (JAHVAMC), Tampa, Florida, where he died three weeks later. The purpose of this healthcare inspection was to review the care of this marine, focusing particularly on his care at the JAHVAMC. In performing this review, it became apparent that many of the issues it raises have implications for the medical care of other combat-wounded soldiers, sailors, marines, and airmen. Thus, the second purpose of this review is to alert both the Veterans Health Administration (VHA) and the DoD to issues with clinical applicability that were highlighted by the care of this single grievously wounded marine.

2. Background

In early December 2004, VA's OIG was informed by the Secretary of Veterans Affairs of the death at the JAHVAMC of a 21-year-old active duty, combat-injured marine. This marine had received extensive medical, surgical, and rehabilitative care from military facilities in Iraq; at the Landstuhl Regional Medical Center (LRMC), Landstuhl, Germany; the National Naval Medical Center, (NNMC), Bethesda, Maryland; and the JAHVAMC.

The marine's death was considered unexpected and unexplained by his family, which was frequently in attendance at his bedside. Although his initial wounds in Iraq were grievous, he nonetheless appeared to be improving over time, only to deteriorate relatively quickly at the JAHVAMC beginning on the weekend of October 16-17, 2004. Further, at autopsy, the patient's cause of death was determined to be bacterial

meningitis. This diagnosis was not made pre-mortem (before death). VA's Secretary requested the OIG to perform an independent evaluation of the patient's quality of care.

On December 7, 2004, OHI sent a team of physicians and an advanced practice nurse to the JAHVAMC to review the care of this patient.

3. Scope and Methodology

We obtained and reviewed the patient's medical records (electronic and paper) as well as non-medical records pertaining to the patient's care during his September 30 - October 22, 2004 JAHVAMC hospitalization. Additionally, we obtained and reviewed the patient's DoD medical records, including the Casualty Status Report, selected medical records from the LRMC, and medical records from the NNMC. We also obtained and reviewed admission and mortality data for patients admitted to Veterans' Health Administration (VHA) facilities for traumatic brain injury. We obtained information concerning training and continuing medical and nursing education for the JAHVAMC staff in the care of combat injuries.

We met with the pathologist at the Medical Examiner Department, Hillsborough County, Florida¹ who, on October 22, 2004, performed an autopsy of the patient. We also met with the Director, Medical Examiner Department, Hillsborough County, primarily concerning release of information issues. In addition to these meetings, we obtained for review from the Medical Examiner Department, Hillsborough County copies of photographs taken during the autopsy procedure, and stained slides of tissue likewise obtained during the autopsy. Additionally, we arranged for tissue samples from the autopsy to be sent to the Armed Forces Institute of Pathology (AFIP) in Washington, D.C.

We consulted with a senior neuropathologist at the AFIP regarding this case, and we discussed the case with the AFIP's Office of the Armed Forces Medical Examiner.

We made site visits to the JAHVAMC December 7-9, 2004, and February 14-16, 2005. In the course of these visits, we interviewed JAHVAMC medical, nursing, and administrative staff involved in the care of the patient. We interviewed the JAHVAMC pathologist who served as a liaison with the Medical Examiner Department, Hillsborough County. We discussed the case at length with the JAHVAMC Chief of Staff, who is a recognized authority on combat injury.² We obtained copies of all radiographic (imaging) studies of the patient from the NNMC and the JAHVAMC, such as computerized tomography (CT) scans of the head and abdomen, for review by OHI and its consultants.

¹ 401 South Morgan Street, Tampa, FL 33602

² See *Emergency War Surgery Second United States Revision of the Emergency War Surgery NATO Handbook*. Thomas E. Bowen and Ronald F. Bellamy, Editors. United States Government Printing Office. Washington, D.C. 1988.

We inspected Ward 2CN at the JAHVAMC where the patient spent most of his hospitalization at the JAHVAMC. We also inspected the JAHVAMC Intensive Care Unit (ICU) where the patient resided from October 19, 2004, until his death on October 22, 2004.

We met with the patient's mother, who was frequently at the patient's bedside, and also spoke with other family members and a family friend.

This case raised highly complex medical, surgical, and rehabilitative care issues. In order to develop a consensus of expert opinion, further our understanding of the treatment received by this marine, and assist us in making recommendations to improve the care of all military and civilian personnel injured in Operation Enduring Freedom/Operation Iraqi Freedom (OEF/OIF), we asked recognized authorities in neurology, infectious diseases, neurosurgery, neuroradiology, and neuropathology to review the case in detail and share their impressions with us. Thus, our consultants included a neurologist, a neurosurgeon, two neuroradiologists, two infectious diseases specialists, and a neuropathologist. These consultants included both VA and non-VA physicians.

In order to determine if there has been increased mortality among such patients, we extracted data from the VHA Patient Treatment File for FY04 and the first quarter of FY05. We selected all active-duty patients discharged from the four lead TBI centers who had been hospitalized on Rehabilitation units with diagnostic codes consistent with traumatic brain injury. We identified 138 individuals. The subject of this report was the only patient identified who died while hospitalized.

We met with a member of the NNMC staff who was knowledgeable about the patient's care at that institution and who was familiar with his transfer to the JAHVAMC.

In accordance with our authority under the Inspector General Act, this report focuses primarily on the patient's care at the JAHVAMC. Several concerns were raised to us by the patient's family about post-mortem events such as communication of information to the family of the deceased marine. We identified those issues in this report. However, we did not investigate them, as they appear to focus around the release of information and family notification policies of the Medical Examiner Department, Hillsborough County, Florida. Similarly, we identified, but did not review, issues surrounding the disposition and transfer of the patient's body from the Medical Examiner Department, Hillsborough County, Florida, to the patient's home in South Carolina for memorial services and interment. These events were coordinated between the Medical Examiner Department and the Marine Corps. Finally, issues surrounding DoD death benefits for this active duty marine were raised with us by the family.

The inspection was conducted in accordance with the *Quality Standards for Inspections* published by the President's Council on Integrity and Efficiency.

4. Inspection Results

I. CASE REVIEW

The patient was a healthy 20-year-old man at the time that he suffered severe trauma on August 21, 2004, while on active-duty as a combat engineer with the United States Marine Corps (USMC) in Iraq. His Humvee struck an “improvised explosive device” (IED)³, and he sustained severe, life-threatening injuries to his head, chest, abdomen, and back. All occupants of this vehicle were killed or seriously wounded.

At the scene of the explosion, the patient was intubated (i.e., a breathing tube was inserted into his trachea), a chest tube (a device used to expand a collapsed lung) was inserted into his thorax, and other emergency trauma and life support measures were instituted.

The patient was transported to the 31st Combat Support Hospital in Baghdad, Iraq, where he underwent emergency exploratory laparotomy (an operation in which the abdomen is opened in order to assess and repair damage). A splenectomy (removal of the spleen), partial pancreatectomy (removal of the pancreas), and repair of gastric perforations were performed. The antibiotic drugs meropenem and vancomycin were administered intravenously. Radiographs revealed a large left skull defect, a left pneumothorax (collapsed lung), and a three-column fracture of the second lumbar vertebrae.

Over the next three days at the 31st Combat Support Hospital in Baghdad, the patient underwent further extensive surgery including a cranioplasty (surgical repair of a defect or deformity of the skull),⁴ and laminectomies (surgical removal of the bony arches of several vertebrae)⁵ including the third lumbar vertebra (L3), and partial laminectomies of the second and fourth lumbar vertebrae (L2, L4) to relieve pressure on the spinal cord. Also, extensive skin sloughing was noted.

On August 24, the marine was evacuated from Iraq to the Landstuhl Regional Medical Center, Landstuhl, Germany. At the LRMC, the patient underwent further surgery, including a thoracolumbar spine stabilization in which metal rods were inserted in the lower thoracic and lumbar spine regions, and lumbar vertebrae 1-3 (L1-L3) were fused.

The patient also required, and was provided, burn care for his back. At the LRMC the patient suffered diffuse desquamation (skin sloughing) that was diagnosed as an reaction to the drug phenytoin.⁶

³ “An IED can be almost anything with any type of material and initiator. It is a “homemade” device that is designed to cause death or injury by using explosives alone or in combination with toxic chemicals, biological toxins, or radiological material.” -- <http://www.globalsecurity.org/military/intro/ied.htm> [3/5/05]

⁴ The American Heritage® Stedman’s Medical Dictionary, Copyright © 2002, 2001, 1995 by Houghton Mifflin Company. Published by Houghton Mifflin Company.

⁵ WordNet ® 2.0, © 2003 Princeton University

⁶ Commonly administered to prevent seizures due to head injuries.

Seven days after the initial trauma, the patient was transferred to the Intensive Care Unit (ICU) at the NNMC in Bethesda, Maryland, where he was to be cared for by the NNMC Trauma Service.

Upon arrival at the NNMC, the patient remained intubated and receiving 40% oxygen. He continued to have a chest tube in place to keep his lung expanded, and surgical drains in his abdomen also remained. Also, despite cessation of phenytoin, the patient's rash persisted.

At the time of admission to the NNMC ICU, the patient's vital signs showed his blood pressure (BP) = 137/81 millimeters (mm) of mercury (Hg) and pulse = 76 (normal = 60-100 beats/minute). The first recorded ICU temperature was 99.2 degrees Fahrenheit (°F). However, most subsequent temperature readings that day and in the ensuing days were higher. Admission laboratory values showed normal serum chemistries except for a low albumin at 2.4 gram (g)/deciliter (dl) (normal = 3.5-5.5 g/dl); aspartate aminotransferase (AST) = 76 Units (U)/liter (l) (normal = 17-49 U/l), and alanine aminotransferase (ALT) = 90 U/l (normal = 7-56 U/l). Renal (kidney) function was normal. Amylase was minimally elevated at 115 U/l (normal = 28-110 U/l). Lipase was normal. The prothrombin time was minimally prolonged at 14.5 seconds (NNMC normal = 11.8-14.2 seconds). The partial thromboplastin time was normal. Complete blood count (CBC) showed white blood cell (WBC) count = 15,000/mm³ (NNMC normal = 4,000-11,000/mm³), hematocrit = 32.3% (NNMC normal = 42-52%), platelet count = 419,000/mm³ (NNMC normal = 150,000-450,000/mm³). The WBC differential showed 82.5% polymorphonuclear leukocytes (PMNs). Urinalysis was normal.

Multiple cultures were ordered, and the patient was maintained on the antibiotic drugs started in Iraq and continued at the LRMC.

In the first 1-2 days after admission, the patient had CT scans of the head; cervical, thoracic, and lumbar spine; and a CT scan of his abdomen.⁷ The head CT scan showed "malacia [softening] changes in the left frontal lobe adjacent to the craniectomy site," and air within the right foramen lacerum.⁸ The cervical spine CT scan revealed a comminuted fracture of the right facet of the atlas (C1).⁹ Also, bilateral rib fractures at the T1 level were noted incidentally on this scan. The thoracic and lumbar CT scans showed extensive pathology including posterior fusion of T12-L4, an L2 burst fracture with retropulsed fragments, and multiple other fractures of the vertebral bodies and transverse processes, as follows:

T10: Fracture of the left transverse process and dislocation of the rib on the left; some air within the soft tissue adjacent to the right pedicle.

⁷ NNMC CT scans performed late August 28 and/or early August 29

⁸ "An irregular aperture on the lower surface of the skull bounded by parts of the temporal, sphenoid, and occipital bones that gives passage to the internal carotid artery." *Merriam-Webster's Medical Dictionary*. Merriam-Webster, Inc. 2002.

⁹ "Broken or crushed into small pieces." *Dorland's Medical Dictionary, 27th Ed.* 1988.

T11: Fracture/dislocation of the left rib with small avulsion from the lateral process and from the head of the rib; some air within the soft tissue adjacent to the pedicle.

T12: Dislocation of the left rib. Bilateral pedicle screws in place at this level with adjacent air within the soft tissues.

L1: Laminectomy, with bilateral pedicle screws in place with adjacent air in the soft tissues. Bilateral fractures of the lateral processes.

L2: Burst fracture of the body with retropulsed fragments, some of which are within the central canal. Fracture through the transverse process at this level.

L3: Small fracture on the right side of the vertebral body. Pedicle screws from laminectomy. Right facet open at L3-4.

L4: Pedicle screws in place¹⁰

The CT images showing air in the region of the foramen lacerum suggested to NNMC clinicians the possibility of internal carotid artery dissection. Thus, on August 31, cerebral angiography (an x-ray procedure that permits visualization of the blood vessels of the head and neck) was performed in order to assess this possibility. The procedure revealed no abnormality.

The abdominal CT scan (including the lung bases) showed right lower lobe atelectasis and left pleural effusion, fluid at the splenectomy site, and free fluid within the pelvis. In addition to these scans, the patient also had numerous plain film x-ray studies.

The patient's splenectomy made him vulnerable to life-threatening bacterial infection and sepsis (bloodstream infection).¹¹ Accordingly, three immunizations for post-splenectomy prophylaxis were administered. These immunizations were directed at the bacteria *Streptococcus pneumoniae*, *Haemophilus influenza*, and *Neisseria meningitidis*.

On September 1, the patient was successfully weaned (i.e., gradually removed because he could breathe on his own) from a ventilator and extubated (breathing tube removed). However, medical problems continued. The patient's fever persisted, with a temperature up to 102 °F. He also had an elevated WBC count of 26,000/mm³. These findings led NNMC clinicians to perform a lumbar puncture (LP)¹². This procedure was first attempted at the bedside, without radiographic assistance. However, it could not be completed successfully at the bedside, and another attempt was made to perform this test in the NNMC Radiology Department using fluoroscopy; this attempt was successful. The patient's cerebrospinal fluid (CSF) revealed WBC = 78/mm³ (normal = 0 PMNs/mm³ and 0-5 mononuclear cells/mm³) of which 88% were PMNs; 656 RBCs/mm³ (normal = 0/mm³); glucose = 70 mg/deciliter (mg %) (within normal limits); and protein =

¹⁰ NNMC CT scans performed late August 28 and/or early August 29

¹¹ Mandell, et. al., Editors. *Principles and Practice of Infectious Diseases, 5th Ed.* Churchill Livingstone, Inc. 2000. pp. 3171-3172.

¹² A diagnostic test involving insertion of a needle into the fluid in the spinal canal, so as to obtain cerebrospinal fluid for diagnostic tests.

91 mg% (slightly elevated).¹³ There were no organisms identified on a Gram stain or India Ink preparation of the patient's CSF. Bacterial and fungal cultures of the CSF were negative. On the following day (September 2), a neurosurgery consultant wrote, "collection surrounding posterior hardware likely pseudomeningocele. No current markers suggestive of infection of hardware."

Follow-up CT scans showed persistence of the patient's pneumothorax, pleural effusion (fluid in the lungs), bilateral basilar atelectasis (lung collapse at the bases of the lungs), fluid at the site of the patient's splenectomy, and an accumulation of fluid in the patient's lower thoracic and lumbar regions.

On September 2, the medical record notes that an abdominal drain yielded pus. The yeast *Candida albicans* was identified in this drainage. A CT-guided needle aspiration of the left upper abdominal quadrant was performed in order to further evaluate the fluid at the splenectomy site. A procedure note states that, "a 16-F pigtail catheter drain was advanced into the fluid collection located between the left hepatic lobe and stomach...opaque straw-colored fluid spontaneously flowed from the drain." Fluconazole, a fungistatic agent used in the treatment of candidiasis, was initiated.

The intra-abdominal drainage was also found to contain significant levels of pancreatic enzymes. The patient was placed on a diet that would allow nothing by mouth, and total parenteral nutrition (TPN)¹⁴ was initiated. Cultures from the marine's sputum, axilla (armpit), and groin that had been obtained at the time of his NNMC admission grew *Acinetobacter*.¹⁵ The patient was placed on contact precautions.¹⁶ Also, other bacteria were identified from the patient's initial NNMC cultures. They included coagulase-negative *Staphylococcus* which was cultured from the patient's blood and sputum, *Pseudomonas* from the patient's sputum and axilla, *Klebsiella* from the patient's nose, and *Enterobacter* from the patient's axilla.

On September 5, one week after admission to NNMC, the patient's chest tube was removed. At that time, it was noted that he was having severe lumbar pain, as well as transient loss of sensation in his lower extremities associated with re-positioning. On September 7, a CT scan of the patient's abdomen revealed no significant interval change in the gastro-hepatic fluid collection since September 2. Also, the patient's post-splenectomy fluid collection was smaller. The accumulation of fluid in the patient's back noted in an earlier CT scan showed increased rim enhancement, consistent with abscess formation in that region. A filling defect in the patient's left external iliac vein

¹³ CSF normal values from Kasper, et. al., Editors. *Harrison's Principles of Internal Medicine*, 16th Ed., 2005.

¹⁴ A means of providing fluid and calories intravenously

¹⁵ See "*Acinetobacter baumannii* Infections Among Patients at Military Medical Facilities Treating Injured U.S. Service Members, 2002--2004," *MMWR*, November 19, 2004 / 53(45);1063-1066

¹⁶ Contact precautions are used when an infectious agent can be spread either by directly touching infected body fluid or an infected site, or by touching equipment contaminated by the infection. They include appropriate resident placement, glove use, hand washing, gown use, appropriate resident transport, dedicated use of noncritical equipment or adequate cleaning and disinfecting of shared equipment -- From: <http://www.amda.com/clinical/infectioncontrol/precautions.htm> [3/5/05]

was observed which was felt to be consistent with thrombosis (clotting). The patient was started on heparin anticoagulation to prevent this clot from extending or propagating.

On September 7, the Neurosurgery Service performed a procedure. We could not locate a procedure note, but the patient's medical records indicate that the procedure was a bedside aspiration of a pseudomeningocele (a non-congenital CSF collection often found after spine surgery).¹⁷ Analysis of fluid obtained revealed WBC = 5,460/mm³ of which 91% were PMNs; 18,690 RBCs/mm³; glucose = 41 mg%;¹⁸ and protein = 1330 mg%¹⁹. A bacterial culture of the fluid was negative. In our review, we learned that clinicians at the JAHVAMC were unaware of this procedure or its results.

On September 8, due to persistent unexplained fevers and leukocytosis (elevated WBC count), the patient was taken to the operating room at the NNMC. An exploratory laparotomy and drainage of the fluid collection in the left upper quadrant of the patient's abdomen were performed.

On September 9, an NNMC resident physician wrote, "Patient continues to be febrile with elevated WBC and CSF suggesting infection. Will consult ID [Infectious Diseases Service]..." An intern wrote on the same day, "...now with recurrent spiking fevers despite ex lap [exploratory laparotomy]..." and on September 11 a Neurosurgery Service physician wrote, "Consider repeat culture of back fluid collection (CT guided if needed) for [recurrent or repeated -- handwriting illegible] fevers."²⁰

The next day, the patient's blood cultures grew coagulase-negative *Staphylococcus*. Also on September 11, the patient was seen by an NNMC dermatology consultant for a painless, pruritic (itchy), vesicular (blistery) rash which had appeared on his left arm, axilla, and back over the preceding two days. A scraping of the patient's skin lesions was obtained, and it was positive by direct fluorescent antibody for the *Varicella zoster* antigen; a Tzank smear was also positive. Overall, this picture was consistent with a diagnosis of *Herpes zoster* or shingles. Acyclovir therapy was initiated.

Despite these multiple medical and surgical problems, the patient was felt to be gradually improving. On September 12, almost two weeks after admission to the NNMC, the patient was transferred from the ICU to the Trauma Service surgical ward.

The patient remained in substantial pain, and a Pain Service consultant recommended treatment with methadone, amitriptyline, and rofecoxib. Also, the Infectious Diseases Service, which had been following the patient, recommended a continued antimicrobial (antibacterial, antifungal, and antiviral) drug regimen of meropenem, vancomycin, fluconazole, and acyclovir. The first three of these drugs (meropenem, vancomycin,

¹⁷ Progress Note by Trauma Surgery resident

¹⁸ Low for CSF relative to serum glucose, which = 130 mg%

¹⁹ High for CSF

²⁰ During a period of outage of the computer system for the electronic medical record at the NNMC, progress notes were handwritten.

fluconazole) were to be administered intravenously for 30 days, and the last (acyclovir) for 10 days. On this schedule, the meropenem was due to be completed on September 26, vancomycin completed on September 28, and fluconazole completed on October 2. The 10-day course of acyclovir therapy was due to be completed on September 20.

Meropenem was stopped as scheduled at the NNMC on September 26. However, for reasons that we could not find documented in the patient's medical record, the patient's vancomycin was continued beyond its initially expected 30-day stop date. The 10-day acyclovir course was completed as scheduled.

In view of the patient's lower thoracic and lumbar fluid collection, CT myelography (CT scan of the spinal cord after injection of air or a radiopaque substance to permit visualization) was considered. However, NNMC clinicians decided against this procedure because the patient's temperature and WBC count were falling. By September 15, his WBC count had fallen from a high of 19,800/mm³ a week earlier to a normal reading of 9,400/mm³. The drug erythropoietin, a red blood cell bone marrow stimulator, was started because the patient was persistently anemic, (hematocrit = 24%), with no apparent active bleeding to explain this low hematocrit.

By mid-September, NNMC clinicians continued to believe that the patient was improving, and that ultimately he would require rehabilitation therapy. Accordingly, NNMC clinicians initiated communication with the JAHVAMC Traumatic Brain Injury (TBI) program.^{21,22} The JAHVAMC serves as one of four lead Veteran's Health Administration (VHA) TBI centers. The JAHVAMC and the Hunter Holmes McGuire VAMC, Richmond, Virginia were the closest of the four to the patient's home in the Charleston, South Carolina, area.

A September 16 progress note in the VA medical records shows that a JAHVAMC Physical Medicine and Rehabilitation Service (PM&RS) nurse practitioner received information about the patient from the NNMC. She forwarded this to the anticipated PM&RS attending physician, who requested, "updated progress notes and restrictions once patient is fitted for TLSO [thoracolumbosacral brace] and allowed to get out of bed. Will also need documented plan for timing of JP [Jackson-Pratt] drain removal."²³

The patient continued to appear to improve at the NNMC. On September 17, he was able to tolerate a regular diet, and TPN was discontinued. However, the hematocrit remained low, and on September 20, with the hematocrit = 19%, the patient was given a transfusion of two units packed red blood cells.

²¹ The Defense and Veterans Head Injury Program (DVHIP) was established in 1992 as a collaborative VA-DOD effort to better manage and provide the full continuum of care necessary to treat traumatic brain injured patients.

²² "Oversight Review of Selected Aspects of the Veterans Health Administration's Traumatic Brain Injury Program," VA OIG Report No.: 9HI-A28-119, June 30, 1999

²³ Closed intraabdominal catheter drains with a small plastic ball on the end of the drain to create suction to remove accumulated fluids. See <http://www.surgicaloncology.com/soaexpect.htm> [3/5/05]

The JAHVAMC PM&RS attending physician recorded updated NNMC information in a JAHVAMC progress note dated September 23. He wrote, "Will accept for admission once patient has TLSO [thoracolumbosacral orthosis]."

On September 27, the patient went, while still in a wheelchair, to see a Washington Redskins football game. On September 28, one month after admission to the NNMC, using a TLSO orthosis (brace) and a walker, the patient was able to walk 50 feet. On this day, the JAHVAMC PM&RS attending physician accepted the patient in transfer from the NNMC to the JAHVAMC.

On September 29 he complained of a severe headache that persisted despite medication, but the headache resolved by that evening. On the morning of September 30, the marine was transported to Andrews Air Force Base for an Air Evacuation flight to the JAHVAMC. The patient was flown to McDill Air Force Base and thereupon transported to the JAHVAMC. He received supplemental oxygen en route.

The first progress note on the day of admission to the JAHVAMC was timed at 1:35 p.m. the same day. At that time, the patient was observed by JAHVAMC clinicians to be alert, cooperative, and oriented to person, place, month, and year. He reported having a good appetite, and denied having any pain while lying at rest. Additionally, he had no complaint of headache, blurred vision, dyspnea (difficulty breathing), dysphagia (difficulty swallowing), or dysuria (difficulty with urination). He had two Jackson-Pratt drains in his left abdomen, which drained a small amount of serosanguinous (serous, bloody)²⁴ fluid.

The patient's admission medications to the JAHVAMC included vancomycin, fluconazole, warfarin, methadone, amitriptyline, ranitidine, acetaminophen, hydroxyzine, valdecoxib, magnesium oxide, insulin by sliding scale, and topical skin preparations. It was expected that the patient would require approximately four weeks of rehabilitation therapy, and a tentative discharge date was set for October 29.

From October 1 to October 2, the patient underwent initial evaluation by JAHVAMC occupational, physical, and recreation therapists; a speech pathologist; a nutritionist; a social worker; and the PM&RS attending physician. The patient ate without difficulty. He experienced intermittent headaches that were relieved by acetaminophen or ibuprofen. Warfarin therapy, which had been prescribed at the NNMC due to left iliac vein thrombosis, was discontinued because blood tests indicated excessive anticoagulation. It appeared that the patient had a high degree of sensitivity to warfarin, and a Pharmacy Service consultant attributed this sensitivity to the concomitant administration of warfarin and fluconazole (the antifungal agent that the patient was receiving due to his *Candida albicans* infection).²⁵

²⁴ Merriam-Webster's Medical Dictionary, © 2002 Merriam-Webster, Inc.

²⁵ See: Black DJ, Kunze KL, Wienkers LC, Gidal BE, Seaton TL, McDonnell ND, Evans JS, Bauwens JE, Trager WF; "Warfarin-fluconazole. II. A metabolically based drug interaction: in vivo studies," *Drug Metab Dispos* 1996 Apr;24(4):422-8

On October 3, the patient experienced vomiting that was felt to be related to constipation, and for which bisacodyl (a laxative) was prescribed. In fact, the patient had complained of having had no bowel movement in a week. An abdominal x-ray was taken, and it showed a large amount of stool in the patient's abdomen. Lactulose (a synthetic sugar used to treat constipation) was added to the patient's drug regimen. The patient finally had a normal bowel movement; however, he also began to complain of abdominal pain. This was treated with an antacid and intravenous promethazine (an anti-nausea drug) with little relief.

The patient continued to experience abdominal symptoms including nausea, vomiting, and pain. These symptoms continued from October 4 to October 7 and during this time he was not able to participate in most planned rehabilitation activities. A Surgery Service consultation was requested in the afternoon of October 4. The PM&RS attending physician was concerned about a possible pancreatic fistula, a possibility that had been raised by the NNMC in its notes. Also, a methadone taper was begun, as this potent narcotic drug that the patient was receiving for pain is well known to cause constipation.

Throughout this time period, with the exception of an occasional high heart rate, the marine's vital signs were normal. On physical examination, his abdomen was tender to direct palpation. However, he did not have rebound tenderness (a sign of peritonitis). His WBC count, amylase, and lipase were normal. His anemia persisted. The patient was also found to have an elevated platelet count, as had been noted throughout his NNMC hospitalization.

A surgical resident saw the patient on October 6 and wrote, in a note entered at 7:10 p.m., that the patient had "no classic acute abdomen findings." Enemas and correction of hypokalemia (low serum potassium level) were recommended for management of constipation. The Surgery Service resident's note was co-signed by an attending surgeon at 7:26 a.m. the next morning (October 7). There was no documentation that an attending surgeon saw the patient at this time. Also on October 7, vancomycin was discontinued.

Due to persistent vomiting, it was decided to obtain a CT scan of the abdomen. A nasogastric (NG) tube was inserted in order to administer contrast material for the CT scan. The scan, performed, October 7, showed:

Small left subdiaphragmatic fluid collection in this post splenectomy patient. Differential possibilities include a postoperative seroma/hematoma, abscess or pancreatic pseudocyst. Hepatomegaly, with a small amount of adjacent fluid. Increase colonic stool, with dilated small bowel loops and a distended bladder. These are probably the sequela of a paralytic ileus. Tiny left pleural effusion with minimal left lower lobe atelectasis or infiltrate. L2 vertebra burst fracture, status post fusion.

Fluconazole (the patient's antifungal drug) was discontinued as scheduled on October 8. On that day, an elevated WBC count at 13,600/mm (JAHVAMC normal range = 4,200-10,300/mm³) was noted for the first time since discharge from the NNMC. A PM&RS physician requested of the Surgery Service that the patient be transferred to an acute care ward in view of the patient's continuing need for nasogastric suction and enemas, as well as inability to participate in rehabilitation activities. That day, the PM&RS attending wrote:

Discussed pt.'s [patient's] case with Dr. [Surgery Service chief resident]. They feel patient's ileus is due to hypokalemia and that he needs potassium corrected along with saline enemas to decompress the bowels along with NGT [nasogastric tube] to suction. Discussed transfer of patient to surgical service. He stated he would discuss this with his attending.

Later in the day on October 8, the patient was seen and examined by a Surgery Service attending surgeon. His (the patient's) temperature was 101° F, but he had no abdominal pain or tenderness. In the progress note entered by the chief surgical resident who saw the patient with the attending surgeon, "pan culture" was recommended.²⁶ That note also included a recommendation to measure the patient's arterial blood gases (ABGs), administer further enemas, and request a gastrograffin enema for therapeutic purposes.

The patient's WBC count continued to rise. By Saturday, October 9, it was 17,800/mm³. The differential count showed 23% of these cells were bands (a type of immature white blood cell). Urinalysis revealed WBCs in the patient's urine consistent with a urinary tract infection. ABGs on room air showed a mild lack of oxygen in the bloodstream (hypoxemia).²⁷ The Chief, PM&RS, notified the Medical ICU (MICU) and Surgical ICU (SICU) on-call physicians of a possible need to transfer the patient to the MICU or the SICU. However, for the time being, it was decided that the patient would remain on Ward 2CN of the PM&RS. He was treated for presumed urinary tract infection.

Also, on October 9, the JAHVAMC Infectious Diseases Service was consulted, and an Infectious Diseases Service fellow recommended by telephone that intravenous vancomycin be restarted, and that the intravenous antibiotics ciprofloxacin and piperacillin-tazobactam be started. The patient's temperature rose to 101° F on October 10, but it returned to normal later that day and the patient felt better. An evaluation by the Infectious Diseases Service fellow was performed that afternoon. She provided a differential diagnosis, which was as follows:

Fevers with leukocytosis: infectious DDx [differential diagnosis] includes urine vs [versus] gi [gastrointestinal] vs pulm [pulmonary] vs other infectious (lumbar hardware) - non-inf [non-infectious] DDx includes DV/PE [deep vein thrombosis/pulmonary embolism] vs drug fever vs central vs autonomic dysregulation vs other (asplenia related leukocytosis) - in this there are several

²⁶ Extensive culture, that may include body fluids such as blood, sputum, urine, cerebrospinal fluid, etc.

²⁷ Values as follows: pH = 7.45, pCO₂ = 37 mm Hg, pO₂ = 76 mm Hg

infectious etiologies that may be etiology including UTI [urinary tract infection] vs possible GI abscess due to surgery vs ileus vs infected pleural effusions vs possible infected hardware with lumbar fluid collection

The Infectious Diseases Service consultant's recommended plan was to:

- 1) monitor blood cultures
- 2) check cbc as last done yesterday with incr [increased] wbc
- 3) repeat urine culture
- 4) follow blood cultures for now
- 5) if all w/u remains neg [negative] and pt [patient] still with fevers will need to evaluate back hardware

Also, as noted above, intravenous vancomycin, ciprofloxacin, and piperacillin-tazobactam had been either started, or in the case of vancomycin, restarted.

The medical record documents that the case was discussed with the attending Infectious Diseases Service physician on-call. However, there was no documentation that an Infectious Diseases Service attending physician actually saw the patient in reference to this consultation.

The blood cultures obtained on October 9 were negative, and the patient's urine culture grew multiple organisms, which were considered to be contaminants. Additionally, the patient's urine culture of October 6 was negative.

The patient began to improve and he became afebrile. However, he continued to complain of intermittent abdominal and back pain. A right subclavian triple-lumen catheter was placed for continuing intravenous drug administration. By October 12, the patient was feeling sufficiently improved that he could ingest clear liquids, and he requested to resume his rehabilitation activities. On October 13, a Foley catheter, which had been inserted earlier, was removed. On October 14, the patient had no abdominal pain. However, his elevated WBC count persisted, and he had a temperature up to 100.2 °F. The patient experienced lumbar pain, with radiation to the buttocks.

The patient's care was discussed further with the JAHVAMC Infectious Diseases Service fellow, as well as the Trauma Team at the NNMC, which had been given progress reports on the patient. It was decided to perform further laboratory and imaging studies. A PM&RS note of October 14 indicates:

Impression-
low grade temp with leukocytosis [increased white blood cell count] despite broad spectrum antibiotics
r/o [rule out] abdominal/pelvic abscess [sic]

I discussed case with Dr. [the Infectious Diseases Service fellow], ID [Infectious Diseases]. She will evaluate patient this afternoon. Will order contrast CT of abd [abdomen]/pelvis per ID rec's [recommendations] and recommendation from Trauma Team at Bethesda Naval as per our discussion yesterday via teleconference. I will also repeat cxr [chest x-ray], ua [urinalysis] and culture, f/u [follow-up] cbc and lytes [electrolytes] in am, hyponatremia w/u [work-up], and serum a.m. cortisol level.

On October 14, the patient was felt by the PM&RS treatment team to have returned to his admission baseline. On October 15, he was tolerating a regular diet with little difficulty. He was able to walk short distances independently using a standard walker. However, he was noted to be sleeping poorly, and he was restless during the day. He described difficulty finding a comfortable position. The patient began to complain of diarrhea, and testing for *Clostridium difficile* colitis was ordered. We could not determine from the patient's medical record whether this testing was performed.

A repeat abdominal CT scan was performed on October 15, and it showed a lessening of the patient's left subdiaphragmatic, peri-hepatic, and pleural fluid collections, as well as resolution of the patient's distended bowel and bladder that had been noted on the abdominal CT scan of October 7. The patient's intravenous antibiotic drugs were to be continued until October 18 at the recommendation of the Infectious Diseases Service fellow, and thereupon discontinued if the patient's cultures were negative and his WBC count receded to a normal level.

The patient's increased WBC count did not return to normal. On October 16, the WBC = 21,700/mm³. One of his preliminary blood cultures grew *Propionibacterium acnes*.

In the early hours of October 16, a Saturday morning, the patient was noted by a Ward 2CN staff registered nurse to be "very nervous." Later that day, he was said by the Chief, PM&RS, who was on-call that weekend, to be, "very restless [and] moving continuously." He was treated with alprazolam, an anti-anxiety medication. The patient's WBC count was 21,000/mm³, although he remained afebrile. At 1:27 p.m. on Saturday, October 16, the Chief, PM&RS, considered obtaining a CT scan of the head, but further details of this evaluative process were not in the medical record. The next morning, Sunday, October 17, the patient was observed by a Ward 2CN licensed practical nurse to be, "shaking and restless." He was treated again with alprazolam. Also, metoprolol (a drug generally used for hypertension, tachycardia, and/or angina) was prescribed. There is no documentation in the medical record addressing the reason(s) for this latter prescription.

Nevertheless, the patient went out on pass with his mother, who told us that the patient was well during this excursion. The pass included a visit to a Wal-Mart, the mother's hotel room, and a fast food establishment. Upon returning to the JAHVAMC that evening, the patient seemed generally well. Overall, neither in the medical record, nor in her meeting with OHI, did the patient's mother describe any unusual symptoms, signs, or occurrences during this pass.

However, as the evening of Sunday, October 17, wore on, according to a nursing note signed at 10:58 pm, the patient became, “more disoriented thinking he is at home...sitting up thinks he laying down, shaking and very restless already had ambien and trazadone.” The on-call PM&RS resident was called to evaluate the patient. She came to the medical center, examined the patient, and observed, “Increased confusion after coming back from pass, disoriented to place, time and people, increased temperature and bp [blood pressure].” In conjunction with this evaluation, she ordered an emergency non-contrast CT scan of the head. It showed no acute findings. Neither the two head CT scans obtained at the NNMC in September, nor their reports, were available at the JAHVAMC for comparison. The resident’s progress note did not document a neurological exam (except for mention of “increased tremor/shaking, restless”) and diagnostic considerations were not specified. She placed a Neurosurgery Service consultation, but cancelled it several hours later.

On October 18, the patient attended an occupational therapy session. However, he appeared very tired, and he complained of being cold. The occupational therapist observed increased “shaking” relative to the previous week. The patient also attended physical therapy, and there he was noted to be “confused” and “lethargic.” The physical therapist noted that the patient was, “unable to ambulate as he had all last week. He does not tolerate standing or balance activities as he is unable to remain standing for > [greater than] 30 seconds.” The patient at this time was afebrile and his blood pressure was elevated. His WBC count had been recorded at 24,500/mm³ at 4:00 a.m. on October 18 when he was evaluated by the on-call PM&RS resident. At 11:00 a.m. that same day, it had fallen to 18,700/mm³. On five of the seven occasions during October 17-18 when vital signs were measured, the patient’s heart rate was 108 or greater. Alprazolam was discontinued.

The patient’s electrolytes had shown a persistent, mild hyponatremia (low serum sodium level) with the sodium level in the 132-134 mEq (milliequivalents)/l range (normal = 136-145 mEq/l). However, on October 16, the serum sodium level dropped to 128 mEq/l and on October 17 to 126 mEq/l. PM&RS staff requested an Internal Medicine Service consultation in order to assess the patient’s hyponatremia. The Internal Medicine Service resident wrote on October 18:

1. Hyponatremia: patient appears euvolemic. Current suspicion is that patient has SIADH [syndrome of inappropriate antidiuretic hormone secretion]. With recent history of TBI, also would consider reset osmostat as a possibility. While patient's sodium is low, unlikely that this is the sole contributor to patient's confusion.
 - final read on head CT pending
 - would fluid restrict patient for now. Primary team's plan noted.
 - would also limit the use of psychoactive medications in this patient ie trazodone, zolpidem, alprazolam

2. Low grade fevers, elevated WBC: patient with intermittent low grade fevers and elevations in white count.
 - will defer to ID

And in the attending addendum:

The patient was interviewed with mother at bedside. She notes increased confusion since the weekend but otherwise she states he is unchanged since TBI. Hyponatremia is likely not causing this patient's confusion but could be contributing to it. The etiology is likely SIADH vs Cerebral salt wasting following head injury given Urine Na [sodium] of 37 despite hyponatremia. Agree with fluid restriction. As for confusion is likely multifactorial with infection, medications, and hyponatremia all contributing. Agree with CT scan of the head. Would consider adjusting meds as patient receiving scheduled terazosin, scheduled zolpidem, PRN [as needed] alprazolam, and PRN benadryl. ID is managing his leukocytosis, infection, abx [antibiotics] course.

The patient's status was discussed by phone with the Infectious Diseases fellow, and she agreed to see the patient that afternoon. When the fellow came to see the patient, he was not in his room. Noting that he had attended several therapy sessions earlier in the day, and reasoning that he was probably not acutely ill, she planned to discuss the case with the PM&RS physician. A heavy workload at the time led her to defer that discussion until the next morning.

An October 18 nursing note signed at 2:10 p.m. stated, "patient is alert and oriented but has periods of confusion and confabulation and sometimes speech is garbled...unable to ambulate to bathroom, used wheelchair today. Refused to eat lunch." A nursing note that same day, signed at 8:56 p.m. stated that the patient was "very lethargic sleeping off and on."

The note immediately following was entered on October 19, at 6:08 a.m., by the same PM&R resident who had been called to evaluate the patient on Sunday evening. The resident wrote, "Called by nurse that Pt's [patient's] pulse >150/min, pt has been treated by 3 abxs [antibiotics] for his sepsis, has continuous increased bp and HR [heart rate] in the past several days, the loproressor [a blood pressure lowering and heart-rate control medication] was discontinued yesterday, would let primary team consider the proper arrangement."

The next note, entered by the Chief, PM&RS, at 6:21 a.m. on October 19, stated, "...needs mICU [Medical Intensive Care Unit] assessment." At 6:49 a.m., the Chief, PM&RS, wrote, "talked with MICU resident who is in transition off, will get EKG and stat portable chest."

The next nursing note, started at 3:30 a.m. but not signed until 7:13 a.m., stated that the patient, "continues to get weaker and more confused and [he is] confabulatory with

hallucinations. Pt [patient] is hardly able to turn in bed...vs 0500 [BP=] 143/86 hr [heart rate] 152 1st on call notified.”

At approximately 7:52 a.m., while the patient was being examined by his PM&RS team and an MICU resident, he had apparent seizure activity and became unresponsive. Cardiopulmonary resuscitation (CPR) was initiated immediately, and a “Code Blue” was called. The Code Blue team arrived approximately two minutes later at 7:54 a.m. Endotracheal intubation was accomplished without difficulty. The patient’s initial cardiac rhythm was that of a bradyventricular rhythm, i.e., a slow heart beat originating from the ventricles of the heart. However, the patient had no pulse in conjunction with this rhythm, and therefore his condition was felt to be “pulseless electrical activity” (PEA).²⁸ After receiving epinephrine and atropine (cardiac drugs used in the treatment of PEA), the patient developed a ventricular fibrillation rhythm. However, ventricular fibrillation is not a life-sustaining heart rhythm, and two sets of three electric shocks were administered in an attempt to convert the heart into a life-sustaining heart rhythm. Also, a dopamine infusion was started. Within approximately ten minutes after the initial cardiopulmonary arrest, a pulse was restored, although the patient neither regained consciousness, nor did he resume spontaneous respirations. He was transferred to the MICU.

The patient was re-evaluated by the Infectious Diseases Service, which now recommended that vancomycin and piperacillin-tazobactam be discontinued, and replaced with linezolid, meropenem, and caspofungin. The patient’s ciprofloxacin was continued. Blood cultures remained negative. Due to the possibility that cardiopulmonary arrest was due to a pulmonary embolus (PE), he was anticoagulated with a heparin infusion. However, anticoagulation was discontinued after radiographic tests showed no lung defects consistent with an acute PE, and ultrasonography of the lower extremities showed no new vein clotting.

A Cardiology Service consultant saw the patient, and echocardiography was performed. However, no indication of a primary cardiac disorder as the cause of the patient’s cardiopulmonary arrest was identified. A follow-up CT scan of the head showed diffuse cerebral and cerebellar edema (swelling), which was new since the head CT scan performed one day earlier on October 18. The patient had no electrolyte abnormalities that might have explained his cardiopulmonary arrest.

The Neurology and Neurosurgery Services both evaluated the patient and each concluded that the patient had suffered severe anoxic brain injury, i.e., injury due to prolonged lack of oxygen to the brain. This conclusion was supported by electroencephalography (a brain-wave test), and by radiographic tests that showed that there was no blood flow to the patient’s brain. At this time, the patient continued to have no spontaneous respirations. He was clinically brain dead, and the attending physician discussed in detail the situation with the patient’s mother, who was supported by several

²⁸ PEA is the phenomenon whereby a heart rhythm may be recorded electronically, e.g., on an EKG strip, but is not matched by an actual pumping of the heart. There is no pulse. The heart’s electrical activity remains, but it has been uncoupled from its mechanical pumping action.

family members, friends, and her minister. After waiting for the patient's siblings to gather at his bedside, ventilator support was discontinued at 2:15 a.m. on October 22, and the patient was pronounced dead at 2:20 a.m. on October 22, 2004.

At the request of the patient's mother, and as required by law, an autopsy was performed. The Associate Medical Examiner, Hillsborough County, Florida, performed this autopsy, approximately ten hours after the patient was pronounced dead, with a pathologist from the JAHVAMC in attendance.²⁹ Relevant findings from the autopsy included the Associate Medical Examiner's identification of:

Surgical repair of [the patient's] skull fracture with the wire mesh intact, a fracture of the lateral mass of C1 and remote splenectomy. Autopsy revealed cerebral and cerebellar edema and meningitis with pus around the brainstem and cervical spinal cord. Cerebral spinal fluid culture had mixed contaminant bacterial growth.

The Associate Medical Examiner, Medical Examiner Department, Hillsborough County, Florida, further wrote:

In my opinion, based on all the information known to me at this time, [the patient] died as a result of bacterial meningitis. Because the cerebellar tonsils were swollen and very soft it is unclear if the mechanism was herniation or necrosis of the brainstem. The meningitis developed as sequelae of blast injuries to the head from close proximity to an explosion during war operations. The manner is homicide.

The final diagnoses, cause of death, and manner of death were as follows:

Final Diagnoses:

- Blast injuries to head
 - Open depressed skull fracture
 - Bacterial meningitis
 - Fracture of 1st cervical vertebra
 - Remote craniectomy and repair of skull fracture

- Blast injuries to torso
 - Lacerations of spleen (anamnestic)³⁰
 - Laceration of stomach (anamnestic)
 - Left pneumothorax (anamnestic)
 - Lacerations of pancreas (anamnestic)

²⁹ Hillsborough County, Florida, Medical Examiner Department, Report of Diagnosis and Autopsy on [Patient's name], File 04-06029

³⁰ Of or relating to the current or previous medical history of a patient -- The American Heritage® Stedman's Medical Dictionary Copyright © 2002, 2001, 1995 by Houghton Mifflin Company. Published by Houghton Mifflin Company.

Cause of Death: Bacterial Meningitis due to Open Fracture of Vault of Skull due to Blast Injuries to Head

Manner of Death: Homicide (Explosion during war operation)

Specialized testing of autopsy specimens was performed at the Armed Forces Institute of Pathology. Detailed analysis revealed “long filamentous branching Gram-positive bacteria” with staining characteristics typical of *Nocardia*. The AFIP diagnosis was “leptomeningitis due to *Nocardia* infection.” **(See Appendix D)**

II. OTHER FINDINGS

Issue 1: Quality of Care

This case raised several significant issues and themes involving the patient's care at the JAHVAMC. In general, we found the intensity and comprehensiveness of his rehabilitative care to be high. However, we noted deficiencies with respect to other specific aspects of care. These involved: (a) the evaluation of persistent fever and leukocytosis; and (b) the management of mental status changes Saturday, October 16, through Tuesday morning, October 19.

A. Evaluation of Fever and Leukocytosis.

On October 8, the patient had an elevated WBC count at 13,600/mm³. This was the first time it was elevated since discharge from the NNMC and admission to the JAHVAMC. On that day, the patient's temperature was recorded at 101° F. The next day, the WBC count rose to 17,800/mm³, and the Infectious Diseases Section was consulted by PM&RS.

On October 9, the Infectious Diseases Section fellow recommended by telephone restarting a previously prescribed intravenous antibiotic and to add two additional intravenous antibiotics. This fellow then saw the patient the next day (Sunday), and wrote the note quoted in the Case Review above. The fellow's visit at the patient's bedside was the only documented visit any Infectious Diseases Section physician until after the patient had a cardiopulmonary arrest on October 19. Furthermore, we found that while the fellow's Sunday night note addressed the immediate issues for which she was consulted, no further visitation or notes having followed, the Infectious Diseases Section response lacked depth of research into the patient's recent medical history and did not provide more than a general outline of how to proceed with the evaluation and management of this most complex patient. The plan that was provided did not adequately consider the possibility that this patient could have an infection in the central nervous system, even though the patient had sustained skull and brain injury that had required recent neurosurgery.

A more thorough Infectious Diseases Section consultation would have included obtaining and reviewing all prior treatment records. A review of those records may have led to the discovery of the two prior abnormal NNMC CSF examinations as well as cultures positive for *Acinetobacter*. Knowledge of abnormal CSF findings should have altered the diagnostic evaluation and treatment plan and may have changed the clinical outcome in this case.

B. Management of Mental Status Changes, October 16 - October 19

On Saturday, October 16, the Chief, PM&RS, who was on-call that weekend, observed that the patient was “very restless [and] moving continuously.” He considered obtaining a CT scan of the head. An anti-anxiety medication was prescribed. The patient’s WBC count was 21,000/mm³, although he remained afebrile. On October 17, the patient went out on pass with his mother. Later that evening he became disoriented.

The on-call PM&RS resident was called to evaluate the patient. She came to the medical center, examined the patient, in conjunction with her evaluation, she ordered an emergency non-contrast CT scan of the head. Her progress note did not document a neurological exam (except for mention of “increased tremor/shaking, restless”) and diagnostic considerations were not specified. The resident placed a Neurosurgery Service consultation, but cancelled it several hours later. She told us that the head CT showing no acute changes precluded the need for consultation.

On Monday morning, October 18, several rehabilitation therapists noted that the patient appeared to have deteriorated. The patient’s primary PM&RS physician reported “patient has been confused over the weekend,” noted a decreasing serum sodium and rising WBC count, and requested Internal Medicine consultation.

The patient’s status was discussed by phone with the Infectious Diseases Section fellow and the medical record states that she would be seeing the patient that afternoon. At interview the fellow said that she had gone to see the patient, but found that he was not in his room. The patient was not seen by the Infectious Diseases Section on October 18.

We found that the medical record, during this time frame, does not reflect the expected standard of medical care. There was no adequate physical examination documented in the chart, no relevant differential diagnosis provided of the patient’s altered mental status, and a general failure to recognize the gravity of this patient’s medical condition. The consultants who were called did not correct these deficiencies, and other consultants such as the Neurology Service, who might have analyzed the situation correctly and taken appropriate actions, were never called.

Issue 2: Blast Injury Patients Present Complex Medical Treatment Issues

In addition to the issues identified above, an underlying theme that emerges is that many of the JAHVAMC clinical staff simply did not grasp how inherently fragile this

patient was. It was this underlying lack of appreciation of his vulnerability that may have led to less intensive diagnostic evaluations than were indicated. Notwithstanding his pattern of improvement from Iraq to the LRMC to the NNMC to the JAHVAMC, he remained highly compromised.

The literature of blast injury indicates how complex and anatomically devastating this type of injury can be.^{31,32} Blast injury is multi-phasic, and each may result in horrific medical consequences. Additionally, the blast itself often instills dirt and foreign bodies, adding a substantial infectious component to these injuries.

Polytrauma patients may be sufficiently compromised such that physiologic disturbances including fever, tachycardia, etc., warrant more aggressive diagnostic intervention than might otherwise be the case. A remark by one of the JAHVAMC VAMC attending physicians who cared for this patient was instructive. He told us, “I [now] have a much lower threshold for any of the [patients] who come over from Iraq to ... take them into the Medical Service.”

In the weeks and months prior to this patient’s admission to the JAHVAMC, there had been insufficient staff training to deal with the multifaceted issues that OEF/OIF patients may present. While we recognize that PM&RS staff was well versed in the care of TBI patients, and that they had undergone significant training in preparation for these combatants, we did not find evidence that the JAHVAMC acute care staff -- including its specialty medical and surgical consultants -- had been properly prepared for these patients.

Issue 3: Communication Between NNMC and JAHVAMC

We found that contact between the NNMC and the JAHVAMC began at least two weeks before transfer of the patient to the JAHVAMC and continued throughout his hospitalization.

The JAHVAMC staff received copies of selected NNMC medical records by fax prior to the patient’s transfer. These included selected progress notes, laboratory data, and vital signs records. Also, copies of some of the patient’s medical records accompanied the patient on his September 30 air transport. However, as best we could ascertain, copies of the patient’s entire NNMC medical records were never sent to the JAHVAMC. Furthermore, JAHVAMC clinicians denied ever having received from the NNMC:

- Laboratory data:
 - a) Two abnormal CSF fluid results
 - b) *Acinetobacter* culture results
- Copies and reports of radiographs

³¹ Langworthy, Michael J.; Sabra John; and Gould, Mark; “Terrorism and Blast Phenomenon,” *Clinical Orthopedics and Related Research* No. 422, pp. 82-87, 2004

³² Ibilja, Cernak; et. A.;, “Blast injury from Explosive Munitions,” *The Journal of Trauma -- Injury, Infection, and Critical Care* Volume 47(1), July 1999, pp. 96-103

We found that both hospitals utilize the electronic medical record and advanced systems for clinical information management. These clinical information management systems include the capacity for storage and transmission of radiographic images. In spite of these capabilities, the JAHVAMC's primary providers and specialists did not have certain information about the patient's NNMC course. Naval medical authorities asserted that a compact disc containing all of the patient's radiological studies had been sent to the JAHVAMC, while JAHVAMC staff denied receipt or even knowledge of this CD.

We concluded that staff at both the NNMC and the JAHVAMC had meaningful and productive contact with each other before, during, and after the patient's transfer. However, the receiving and sending hospital staff failed to ensure that all medical information was provided to JAHVAMC physicians. While an NNMC progress note sent to the JAHVAMC refers to having a "low threshold for [performing a] cisternal tap should fever recur," NNMC CSF results were not provided to JAHVAMC staff.

III. OTHER FINDINGS -- Post Mortem Events

A. Patient's Mother's Assertion that She Learned the Cause of Death from Her Dentist Who Referred Her to a Local Newspaper Article

OHI staff met with the patient's mother and many of his immediate family members. Many of the concerns they expressed to us centered about events occurring after the patient died. One egregious example cited was that the patient's mother stated she learned of the diagnosis of bacterial meningitis as the cause of her son's death from her dentist after he read that in a local newspaper.

Conclusions and Discussion Regarding: "Patient's Mother's Assertion that She Learned the Cause of Death from Her Dentist Who Referred Her to a Local Newspaper Article"

We did indeed confirm that such an assertion was made in a local newspaper. As far as we could ascertain, no member of the JAHVAMC staff released that information to the news media. The autopsy was signed off as "final" by the Medical Examiner Department, Hillsborough County, Florida on December 9, 2004. This was subsequent to newspaper reports indicating that the patient's autopsy showed that he died of bacterial meningitis.

In a meeting with the Director, Medical Examiner Department, Hillsborough County, he told us that autopsy information is public information, and that his Office would not be adverse to releasing preliminary autopsy information. However, we did not attempt to ascertain whether in this particular case the preliminary diagnosis of bacterial meningitis as the marine's cause of death was released by that office to the news media.

We concluded that the patient's mother was given an added burden by virtue of learning of the cause of her son's death from her dentist who had learned it from a newspaper article. We believe it could not have been a particularly difficult matter for the patient's family to have been among the first to learn of the cause of their loved one's death.

B. DoD Benefits and Release of the Body to the Family for Memorial Services.

Another issue that the patient's family raised to us was confusion surrounding DoD death benefits due the family, as well as physical transfer of the marine's body from Hillsborough County, Florida, to the Charleston, South Carolina, area for memorial and funeral services including a full military funeral.

Neither of these processes, according to the family, was without incident. The family told us that their minister had to drive to Hillsborough County, Florida, to obtain the marine's body, and transport it back home to Charleston, South Carolina. The process, according to the family, was so confused, that it caused the viewing of the body to be canceled.

Conclusions and Discussion Regarding: "DoD Benefits and Release of the Body to the Family for Memorial Services"

As these events did not primarily involve VA employees or entities we offer no further comments other than to reflect the expressed concerns of the family.

5. Recommendations

The VISN Director should ensure that the JAHVAMC Director ensures that:

1. Staff physicians involved in the care of this Marine between October 16 and October 19, 2004 have their involvement in this case peer reviewed and appropriate actions taken.
2. The PM&RS physician trainee involved in the care of this Marine between October 16 and October 19, 2004 has her involvement in this case reviewed and appropriate actions taken.
3. The JAHVAMC Chief of Staff reviews and makes appropriate changes to the policies and practice patterns of consultants to ensure that consultations are timely and of the highest quality.

The JAHVAMC Chief of Staff should ensure that all physicians at the JAHVAMC receive training on the medical issues pertinent to the care of combat-wounded patients.

The Under Secretary of Health should take the required actions to ensure that:

1. VA providers are educated on the medical issues that are relevant to the management of blast injury patients.
2. Patients transferred to VHA facilities with continuing medical treatment issues are transferred with all available and relevant medical records.

6. Under Secretary for Health, VISN Director, and Facility Director Comments

The Under Secretary for Health, the VISN Director, and the Facility Director have concurred with the conclusions of this inspection report and have taken actions to implement the recommendations in this report.

7. Assistant Inspector General Comments

The Assistant Inspector General for Healthcare Inspections agrees with the actions taken by the Under Secretary for Health, the VISN Director, and the Facility Director to the issues raised in this report.

(original signed by:)

JOHN D. DAIGH JR., M.D.
Assistant Inspector General for
Healthcare Inspections

VISN Director Comments

Appendix A

Department of Veterans Affairs Memorandum

- Date:** May 2, 2005
- From:** Director, Veterans Integrated Services Network 8 (10N8)
- Subject:** **Draft Report** – Healthcare Inspection – Review of Quality of Care, Department of Veterans Affairs James A. Haley Medical Center, Tampa, Florida – Report Number: 05-00641-083
- To:** Assistant Inspector General for Healthcare Inspections
Thru: Director, Management Review Service (10B5)
- a. Thank you for the opportunity to review the draft report from the OIG Healthcare Inspections team. The VISN has reviewed the response from the facility and concurs with their action plans.
 - b. If you have any questions about the content of this report, the VISN point of contact is Karen Maudlin at (727) 319 – 1063.



George H. Gray, Jr.

Medical Center Director Comments

Appendix B

Department of Veterans Affairs Memorandum

Date: April 28, 2005

From: James A. Halley Medical Center Director (673/00)

Subject: **Draft Report** – Healthcare Inspection – Review of Quality of Care, Department of Veterans Affairs James A. Haley Medical Center, Tampa, Florida – Report Number: 05-00641-083

To: Assistant Inspector General for Healthcare Inspections
Thru: Director, Management Review Service (10B5)
Thru: Network Director, VISN 8 (10N8)

1. The Department of Veterans Affairs (VA) Office of the Inspector General's (OIG) Office of Healthcare Inspections (OHI) was requested by the Secretary of Veterans' Affairs to review the care of an active duty Marine who was seriously wounded in Iraq, treated initially in Department of Defense (DoD) facilities, transferred for rehabilitative care to the James A. Haley Veterans' Hospital, Tampa, Florida, and died there three weeks later. The OIG conducted a healthcare inspection and provided their findings in a Draft Report. The following is a reply from the James A. Haley Veterans' Hospital addressing the findings and recommendations issued in their Draft Report.

2. The two physician members of the Office of Inspector General (OIG) team provided an exceedingly comprehensive overview and certain criticisms of the care this Marine received at the James A. Haley Veterans' Hospital (JAHVAH). We do not take issue with or contest any of their insights or critical remarks.

RECOMMENDATION 1:

Staff physicians involved in the care of this Marine between October 16 and October 19, 2004 have their involvement in this case peer reviewed and appropriate action taken.

RESPONSE Concur

A peer review was performed. The peer reviewer opined it a Level 2 case in which the diagnosis of meningitis was not suspected antemortem. Even if we had been informed by the National Naval Medical Center (NNMC) physicians of his positive spinal tap or if we had independently made the correct diagnosis antemortem, the patient was on comprehensive antibiotic coverage and asplenic, he was therefore facing a 70% mortality risk in spite of appropriate diagnosis or therapy (Appendix 1.) Our Risk Management Committee concurred with the Level 2 determination.

Our concern for scrupulous professional honesty and integrity led us to perform a second “out-of-house” peer review by a highly respected full professor of medicine from the local medical school, a clinician who is not connected to Veterans Affairs. This reviewer raised all of the same concerns that the two IG physicians raised. He opined it to be a Level 3 case, i.e. “most competent, experienced practitioners would have handled the case differently in one or more respects.”

The IG report and our “out-of-house” peer review have resulted in several actions to be enumerated in this response. Additionally, a teaching conference has reviewed the IG report and the peer review with the intent to preclude repetitive shortfalls, such as identified in the management of this case. This conference included physicians and nurses involved in caring for the multiple-injured patient.

RECOMMENDATION 2:

The Physical Medicine and Rehabilitation Service (PM&RS) physician trainee involved in the care of this Marine between October 16 and October 19, 2004 has had her involvement in this case reviewed and appropriate actions taken.

RESPONSE Concur

The physician trainee and the PM&RS clinical staff in general were counseled in some detail by the Chief, PM&RS in regards to the complexity and the time sensitivity of these extraordinarily challenging multiple trauma patients. All trainees will evaluate and treat these casualties with direct oversight by an attending specialist, i.e. PM&RS, Medicine, Surgery, Infectious Disease, Neurology, Neurosurgery, etc.

In addition to counseling the trainee, since she failed to perform an appropriate neurological evaluation, she will be attending additional didactic sessions in the specialties of neurology and neurosurgery.

RECOMMENDATION 3.

The JAHVAH Chief of Staff reviews and makes appropriate changes to the policies and practice patterns of the consultants to assure that consultations are timely and of the highest quality.

RESPONSE Concur

Effective December 23, 2004, the Chief of Staff directed that all consults requested on multiple trauma patients must be initially responded to by the Chiefs of Clinical Services, i.e. Medicine, Surgery, Neurology, etc. The attending may be accompanied by their resident or fellow; however, the service member will be initially evaluated by and closely followed by the attending. Furthermore, because of the time sensitive nature of the multiple trauma patients' stability, these consult requests must be expeditiously responded to on the same day requested.

Following this Marine's death, an additional policy change directed that all multiple trauma patients transferred to JAHVAH for rehabilitation be directly admitted to either the medical or the surgical service, and not the rehabilitation service. Rehabilitation was to be initiated on the medical or surgical service; however, the service member would not be transferred to the PM&RS ward until all parties agreed that the patient's condition and progress justifies transfer.

Furthermore, the Chief of Staff directed that any attending staff can, at any time, transfer any patient to any critical care unit without being delayed by housestaff. That is to say that an attending can and should over-ride the housestaff when the clinical situation dictates.

RECOMMENDATION 4.

The JAHVAH Chief of Staff will ensure that all physicians at the JAHVAH receive training on the medical issues pertinent to the care of the combat-wounded patients.

RESPONSE Concur

We concur with the recommendation to provide additional training on the medical issues pertinent to the care of the combat-wounded service member. For that reason (education) to enhance the quality of care, early last year, we instituted twice-a-week multidisciplinary consultant rounds. The composition of this group includes the Chiefs of Medicine, Surgery, Infectious Disease, Nursing and Clinical Pharmacy. Considerable education and training takes place during the course of these clinical rounds followed by an in depth discussion of pertinent issues, to include evidence based literature handouts. In addition to the foregoing, we instituted V-tel conferences with Walter Reed Army Medical Center (WRAMC) physicians every other week for consultative and follow-up purposes. Similar communication takes place weekly with NNMC personnel telephonically. These two interactions serve the purpose of becoming knowledgeable regards the clinical condition of potential transfers to the JAHVAH Rehabilitation Service and providing follow-up to those two facilities.

We are developing a mandatory half-day course for all physicians dealing with the medical issues related to combat-wounded service members. Experts in neurosurgery, infectious disease and combat trauma will present.

As virtually all of OIF/OEF (Operation Iraqi Freedom and Operation Enduring Freedom) multiple trauma patients result from blast injuries, we have established a Blast Injury Program at Tampa. A conference was held in December 2004 in conjunction with the Special Operations Medical Association (SOMA). This meeting was attended by three of our four physiatrists. The next education meeting will be in December 2005, also in conjunction with SOMA.

The Chief of Staff has forwarded memoranda dealing with leishmaniasis, acinetobacter and other resistant organisms indigenous to the combat theater.

The four VA and three Department of Defense (DoD) member facilities of the Defense and Veterans Brain Injury Center telephonically discuss administrative and current clinical issues dealing with blast and traumatic brain injuries every two weeks.

A handwritten signature in black ink, appearing to read "Forest Farley, Jr.", is positioned above the printed name.

Forest Farley, Jr.

Under Secretary for Health Comments

Appendix C

Department of Veterans Affairs Memorandum

Date: May 31, 2005

From: Under Secretary for Health (10)

Subject: **Draft Report** – Healthcare Inspection – Review of Quality of Care, Department of Veterans Affairs James A. Haley Medical Center, Tampa, Florida – Report Number: 05-00641-083

To: Assistant Inspector General for Healthcare Inspections

Thank you for the opportunity to review and respond to the findings of the inquiry into the quality of care administered by the James A. Haley Medical Center. The recommendations and appropriate responses follow.

The Under Secretary of Health should take the required actions to ensure that:

RECOMMENDATION 1. VA providers are educated on the medical issues that are relevant to the management of blast injury patients.

RESPONSE. Concur

VHA conducted a Polytrauma Conference for the 4 Centers in February, 2005. One of the action items following the conference was additional training for VHA staff. Patient Care Services has the lead and conducted a conference call on May 9, 2005 to further define plans for a Clinical Symposium for Polytrauma.

Representatives from the VHA Central Office, trauma surgeons from National Naval Medical Center (NNMC), and the Chief, Critical Care and Chief, Neurology from Walter Reed Army Medical Center (WRAMC) conferred regarding continuum of care in our Polytrauma units. They discussed holding a live satellite colloquium to address the acute clinical care issues and were in consensus in planning two clinical, and a third administrative conference in a series.

1. The first conference would entail a discussion on acute care issues related to infectious diseases (Acinetobacter, meningitis, wound infections), moderate to severe brain trauma, complex orthopedic injury, nerve damage and pain management. The target audience would be all clinicians in our Polytrauma Centers
2. The second conference would be largely focused on mental health issues, acute stress reaction, disfigurement, family support and chronic pain management. Target audience would be VHA wide clinicians including Polytrauma Center clinicians.
3. The third session would be a more administrative conference to address transfer coordination, record access, Physical Evaluation Board (PEB) / Temporary Disability Retirement List (TDRL) / military retirement vs. VA Compensation. The target audience would be non clinical personnel who deal with polytrauma patients.

RECOMMENDATION 2. Patients transferred to VHA facilities with continuing medical treatment issues, are transferred with all available and relevant medical records.

RESPONSE. Concur

VA/DoD Social Work Liaisons receive referrals from Military Treatment Facility (MTF) Social Workers/Case Managers for Active Duty patients to continue their current health care treatment at VHA facilities. In making those referrals to VHA facilities and as part of establishing a treatment relationship with the VA, VA/DoD Social Work Liaisons assure that medical information, pertinent to the patient's treatment referral, is transmitted to the receiving VHA facility at the time of the referral. As part of the discharge planning process, Social Workers at the MTF send the medical records via hard copy or on a CD at the time of discharge from the MTF. The records are either given to the patient (if appropriate) or sent through the mail to the receiving VHA facility. VA/DoD Liaisons communicate with the MTF Social Worker/Case Manager to assure the plan for the transfer of medical records, which assures the continuum of care in meeting the patient's health care treatment needs.

DoD currently shares information electronically on individuals who have separated from the military approximately six weeks post discharge through the Federal Health Information Exchange (FHIE) project. In order to address the need for bidirectional communication of health data, DoD and VA formed the DoD Clinical Data Repository (CDR) and VA Health Data Repository (CHDR) Working Group. This CHDR functionality is scheduled to be released to provide for bidirectional sharing of clinical information in phases with the first phase functional by the fall of 2005.

Current Process:

Until this bidirectional feed of information being developed in the CHDR project is operational, medical records from the DoD medical facilities are brought or sent to the VA Medical Centers in both paper and compact disk (CD-ROM). If the relevant medical records are not received, the VA Medical Center health information management office

should coordinate with the DoD medical facilities to expedite the transfer of the relevant records. VA has drafted instructions on the process for VA Medical Centers to follow when in receipt of the CD-ROM with pertinent health information and those draft instructions are attached. These instructions are in addition to instruction currently published in VHA Handbook 1907.1 relative to the handling of external medical records.

VHA Health Information Management (HIM) Office will remind field facilities of the need to pay particular attention to the receipt of military health records and review the process on the next VHA HIM monthly conference call.

(original signed by:)

Jonathan B. Perlin, M.D., PhD., MSHA, FACP
Under Secretary for Health

DEPARTMENT OF DEFENSE
ARMED FORCES INSTITUTE OF PATHOLOGY
WASHINGTON, DC 20306-6000

AFIP ACCESSION NO.

2970371

SEQUENCE NO.

01

NAME and SSN: (withheld by AFIP)

04-6029 SDJW

May 19, 2005

Sam Gulino, MD

Hillsborough County Medical Examiner Department

401 Morgan Street

Tampla, 33606

AFIP FINAL DIAGNOSIS

AFIP DIAGNOSIS: 04-6029 Central Nervous System: Leptomeningitis due to Nocardia Infection

A copy of this report has been faxed to you at 813-272-6268 and to the Department of Veterans

Affairs, Office of the Inspector General (54AA) at 202-565-8476.

Two blocks, #2 and #3 were recut and 10 unstained sections sent to the AFIP. Search of Brown-Brenn and Brown-Hopps tissue gram stained sections for bacteria, Ziehl-Neelsen stained sections for acid-fast bacteria, Grocotts Methenamine Silver stained sections for fungi, and Warthin Starry stained sections for spirochetes and bacteria revealed a long filamentous branching Grampositive bacteria that stained Gram-positive on the B&B and B&H stains, silvered on the GMS but not on the WS and was not acid-fast on the ZN stained sections. Unstained section was stained by the Coates-Fite stain that will stain Nocardia bacteria acid-fast. The stain was positive. Unstained sections were also submitted for PCR. The PCR results will be reported as an addendum.

(original signed by:)

Douglas J. Wear, M.D.

Associate Chairman,

Department of Environmental & Infectious

Disease Sciences

OIG Contact and Staff Acknowledgments

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Acknowledgments	Carol Torczon, M.S.N., N.P. Sheila Cooley, M.S.N., N.P. Jerome Herbers, M.D.

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