

SICKLE CELL DISEASE IN AN AIRMAN

First Known Certification via Allogenic Bone Marrow Transplant

By BRUCE B. CHIEN, MD

THE AIRMAN IS a 43-year-old male physician whose sibship included three of eight siblings who were homozygous for sickle cell disease (SSD). The other two siblings had already died due to complications of the disease. In 11/2009, because of continuous life difficulties presented by management of his SSD with hydroxyurea, he participated in a National Institutes of Health trial of bone marrow transplantation for SSD, the cohort report of which was reported in the *New England Journal of Medicine* by Hsieh M.M. et al., 361:14 2309-17.

His hepatitis C was treated with interferon and ribavirin prior to transplant. He did well and in February 2011 received his third-class medical certificate after initially being deferred.

In March of 2012 he developed a factor VIII antibody, and therefore hemophilia A (10% Factor VIII levels), manifest by compartmental bleeding that required fasciotomy in the right forearm. He self-grounded and immunosuppression was initiated transiently with rituximab and then with sirolimus 2 mg/daily. Factor VIII levels rebounded to 172 IU/dl, and he experienced a six-month period requiring no Factor 8 support and had no soft tissue bleeding. PTT was 30.3.

Three years after transplantation he has detectible haptoglobin, normal LDH, bilirubin, and reticulocyte counts; 96% of his CD14/15 cells and 29% of his CD3 cells are from his donor. He has split chimerism and had no hint of GVHD (graft vs. host disease). Quantitative hepatitis CRNA in October 2012 was negative.

The only organ system with a side effect was renal, and the airman continues to have a normal creatinine despite 20 mg/dl of proteinuria, likely due either to SSD or to sirolimus. His lipid profile was unremarkable. By surface echo he has been afflicted with none of the consequences of chronic iron overload. His life transfusional iron overload was treated with periodic phlebotomy, and his serum ferritin decreased from >4500 to 1292. He has retained normal LV function, HbA1c and thyroid functions.

On physical exam in October 2012, medications were sulfamethoxazole and trimethoprim (Bactrim) q.o.d. and sirolimus 2 mg qD. He was normotensive with a nonpalpable spleen. Protein was not detected on urine dipstick. A right forearm fasciotomy scar, healed by secondary intention, was present. The remainder of the exam was unremarkable.

After consultation with the Aerospace Medical Certification Division, he was authorized and was issued a third-class certificate for one year, contingent on annual current status reports. This is to our knowledge the first airman with homozygous sickle cell disease to achieve certification based on allogenic bone marrow transplantation.



Dr. Chien is an aviation medical examiner and practices in Peoria, Illinois. He submitted this case report as the original examining aviation medical examiner.

MEDXPRESS VIDEO WINS TELLY AWARD

THE CIVIL AEROSPACE Medical Institute's production of "MedXPress: It's Easy!" was selected to receive a 2013 Telly Award. Telly Awards are given to honor film and video productions, online video content, and TV commercials and programs. The MedXPress video was created to broadly socialize the new online system with potential users.

The video features an 11-year old aspiring pilot who shows his mother how easy it is to fill out his medical information online so that he will be prepared to get his medical certificate when he turns 16.

"We won a Bronze Telly in the Film/Video Category for informative TV programming," said Manager of Aerospace Medical Education Division **Brian Pinkston** (AAM-400). "We had a strong team that put the video together, led by **Alan Atkins** and **Laura Shepherd-Madsen** of AMI-700 [contract production organization]. They created the script and shot the video. **Susan Buriak**, an instructional system designer from AAM-400, managed the project and the team of AAM subject matter experts to ensure accuracy."

According to Dr. Pinkston, a second installment of the MedXPress video is in production and will be available soon; a video about aeronautical decision-making is being planned for production.



—Information provided by AVS Flyer

CAMI TAKES HYPOXIA TRAINING TO HART

By J.R. BROWN

THE CIVIL AEROSPACE Medical Institute announces the "maiden voyage" of its Hypoxia Awareness & Recognition Trainer (HART). This device is a direct descendent of CAMI's Portable Reduced Oxygen Training Enclosure (PROTE), which was another CAMI innovation. Each device allows participants to experience the effects of hypoxia by reducing the available oxygen by "scrubbing" it out. Air separators remove oxygen and replace it with inert nitrogen. By reducing the oxygen level from 20.95% to 7%, it effectively simulates an altitude of approximately 25,000 feet.

The HART is a normobaric "hypoxia training room" that utilizes the existing walls of the room to help contain nitrogen-rich air. This is another in a long line of CAMI innovations for the purpose of enhancing and promoting aviation safety.

Upon entry, subjects immediately begin oxygen desaturation, quickly feeling the effects of hypoxia. Within 5 minutes, they will feel several symptoms of hypoxia and will rapidly approach the time of useful consciousness. At the end of the 5-minute time limit, subjects don their oxygen masks and will have full recovery within seconds.

The advantage the HART and PROTE have over altitude chambers is that pressure changes do not become an issue. Individuals with head colds, upper respiratory infections, and seasonal allergies would have problems in the chamber because of possible barotrauma to ears and sinuses, but this, obviously, would not be an issue in a normobaric environment.

For further information on either the HART or PROTE, please contact the Airman Education Programs Team at CAMI by calling (405) 954-4837.



Mr. Brown is a training instructor in CAMI's Aerospace Medical Education Division.