Veterinary Corps Celebrates 102 Years of Service

In early June 2018, the 26th Chief of the Veterinary Corps, hosted a celebration of the 102nd anniversary of the establishment of the U.S. Army Veterinary Corps. The traditional cake was cut by the senior and junior-most Veterinary Corps Officers present at the ceremony. They were joined in the cake cutting by former Veterinary Corps Chiefs.

During the ceremony the Corps Chief had the opportunity to highlight the excellent work being performed by members of the Veterinary Corps throughout the year, including Veterinary Corps and Veterinary Warrant officers, Veterinary Services Noncommissioned officers, and Civilians.

Happy Anniversary, US Army Veterinary Corps!
Laboratory Animal Medicine Resident Recognized for Excellence on the ACLAM Exam

The US Army Veterinary Corps Laboratory Animal Medicine residency continues its record of producing highly trained residents. This year marked another Army Veterinary Corps Officer as the receiver the Foster Award for her exemplary performance on the 2017 American College of Laboratory Animal Medicine (ACLAM) certification exam. This very difficult exam is given once a year and typically has a national pass rate of 30-45%. In 1989 Dr. Henry and Lois Foster established this award to recognize excellence in laboratory animal medicine. It was decided to give the award to the individual(s) receiving the highest grade on the exam on their first attempt. In April at the ACLAM Forum the Veterinary Corps Officer was recognized for her achievement. Introductory remarks were provided by her colleague, also a graduate of the USALAMRP and fellow Diplomate of the ACLAM. Roughly 300 members of the College were in attendance to congratulate her on this very prestigious occasion.

Global Health Engagements
Veterinary Corps Officers at the Department of Veterinary Science, along with other members of the Global Health Engagements team, recently published an article, “Global Health Engagement Playbooks: Aligning Tactics with Strategy Using Standardized Engagement Packages” in Military Medicine. Read more about the proposed Global Health Engagement Playbook here:

During the Veterinary Corps’ 102nd Anniversary Celebration, the Corps Chief took the opportunity of recognizing two of the winners of the Annual Veterinary Corps Chief’s Awards.

The Corps Chief recognizes the Food Safety Officer of the Year

The Corps Chief inducts a senior NCO into the Order of Military Medical Merit

The Corps Chief recognized the winner of the Senior NCO COL Walker Leadership Award

The Corps Chief recognized a GS civilian veterinarian for her work at the Animal Health Branch in the Department of Veterinary Sciences
Snapshots Around the Service

Clockwise from top left: PMO course participants work on problems; VCOs learn Polo tips and techniques; A Veterinary Service SGM receives her new shoulder boards during the US Army Sergeant Majors Academy graduation ceremony; A fellow Veterinary Services SGM and his family after his graduation from the US Army Sergeant Majors Academy; The NCO and Soldier of the Year, from Regional Health Command-Atlantic are both members of the Veterinary Services.
Participants in the 2018 Annual Military Veterinary Research and Development Short Course completed another successful year by wrapping up their course in Silver Spring, Maryland.

Sponsored by the U.S. Army Medical Research and Materiel Command, the five-day course provides 40 total hours of education, training and exposure related to Department of Defense research and development mission requirements. Participants came from across the U.S. and included those that are stationed outside of the U.S. as well.

The course serves as the principal recruiting tool geared towards Veterinary Corps Officers. The course exposes participants to research and development specialization offered via the U.S. Army Long Term Health Education and Training program, providing a unique glimpse into the career opportunities available and giving attendees the exclusive opportunity to really see what a day would be like in the life of a lab animal veterinarian, a pathology veterinarian, or a scientific researcher in comparative medicine.

“The large segment of the Veterinary Corps involved in Medical Research and Development missions contribute immeasurably to the overall military effort,” said executive officer for the Animal Care and Use Review Office, part of the USAMRMC Office of Research Protections. “Vaccine, antitoxin, and antidote development, directed toward the protection of military personnel, has been and will continue to be, heavily reliant on military veterinary expertise.”

The course participants visited six different U.S. Army institutes where they were able to have hands-on animal interactions and facility tours. Seeing the different Army Medicine research facilities where Veterinary Corps Service Members work is always a highlight for the participants.

“It was fantastic getting to tour all of the research facilities and being able to hear about their missions,” shared one student. “I plan on applying for one of the programs in 2020.”

A 2017 participant added, “Hearing from the principal investigators was fantastic. It was great to see how vets and the principal investigators work together and what the research accomplishes.”

Participants visited the Uniformed Services University of the Health Sciences, the Armed Forces Radiobiology Research Institute, the U.S. Army Medical Research Institute of Infectious Diseases, the U.S. Army Medical Research Institute of Chemical Defense, the Joint Pathology Center and the Walter Reed Army Institute of Research.

“This course is a very successful recruiting tool for the Army,” said Bro. “In 2017 14 out of 15 attendees reported by survey they would apply to an R&D program. In 2018 eight of nine attendees committed to applying to an R&D specialty. By having educational courses such as the Veterinary Research and Development Short course, the Army ensures that the Veterinary Corps will be able to continue its broad functions of food safety and security, animal care, veterinary public health, and research and development.”
The Public Health Activity - Fort Belvoir (PHA-FB) 2018 Annual Training Exercise (ATX) took place at Joint Base McGuire-Dix-Lakehurst in late April. Along with accomplishing a comprehensive APFT and mandatory training session to improve activity readiness, this exercise provided an excellent occasion for soldiers to network and discuss opportunities within the Activity. This was also the first year that the ATX involved training activities such as land navigation and combat casualty care.

The training exercise commenced with a record APFT event for the Activity followed by group mandatory training on Monday. The following day was the start of the field exercises, with all groups participating in rotating schedules of events over the next 48 hours. The events included unique simulated training events such as weapons qualifications at an electronic shooting range and computer-simulated battlefield team building exercises. Groups received hands-on experience with disassembling, assembling, and functions checks both M16 and M9 weapons and proper United States’ flag folding protocol. Additional soldier skill trainings included basic water survival skills at the indoor pool and day time land navigation. There was simulated combat medical exercise where squads worked to recover a casualty and call in a 9 line medical evacuation. A certified army fitness instructor was on site to teach an interactive class session on how to properly conduct PRT. Additionally, senior officers and NCOs proctored an Army MOS exam at one of the sessions in order to evaluate soldier’s technical knowledge and both of the top scoring 68R and 68T were recognized.

On Thursday, the activity held an organizational day with Commander’s Cup competition. Activity leadership developed an obstacle course competition comprised of multiple lanes of strength cardio obstacles with monkey bars and heavy weight pulls. Each Branch in the Activity tasked four soldiers and assigning one of them to one of four lanes. Each team member completed the fifth lane. Fort Meade Branch outlasted all other Branches and won the Commander’s Cup. The week concluded with an Activity-wide Organization Day with a BBQ, volleyball, basketball, and a talent show. The PHA-Belvoir Commander recognized several soldiers for their respective performance during the week and awarded several PCS awards. Overall, the PHA-FB ATX was a successful operation that built esprit de corps and facilitated the completion of the command’s mission.
Army Public Health Center (APHC), Veterinary Services and Public Health Sanitation Directorate hosted 27 Veterinary Corps Officers from all four Public Health Regions and CENTCOM in May 2018 at Aberdeen Proving Ground, MD for the second annual Food Protection Technical Seminar. Opening remarks were provided by the Director of Veterinary Services and Public Health Sanitation Directorate.

To increase the awareness of public health significance of food protection and to ensure readiness, participants received instruction from APHC staff as well as subject matter experts from the Defense Logistics Agency and the Defense Health Agency (DHA).

The participants spent the week learning about commercial food protection audit standardization and certification, Sanitation Audit Report technical review, Military Sanitary Inspections, and the Food Protection Assessment Report. Participants also received updates on Metrics, milSuite, DOEHRS, One Health, NCO Food Protection Audits of Commercial Establishments, Program Evaluation, ALFOODACTS, and policy updates from DHA.

The week concluded with closing remarks and culminated in a shared knowledge of concepts and skills that prepared highly technical VCOs to ensure the effectiveness of all facets of the Food Protection Program through continuous mission monitoring and evaluation through various measures of performance.
APHC and FDA Host FD371 PMO Course Tailored for DOD Food Safety Auditors

Army Public Health Center (APHC) and the Food and Drug Administration (FDA) hosted a combined FD371 Milk Pasteurization Controls and Tests and FD372 Milk Plant Sanitation and Inspection Course (PMO) at the FDA Minneapolis District Office from in April 2018. The FD371/FD372 course is the only supported PMO training course for commercial sanitary audits in dairy plants. The once a year combined course is tailored for Department of Defense (DoD) Food Safety Auditors.

Veterinary Corps Officers (VCO), Active Duty and Reserve, stationed at CONUS and OCONUS locations were in attendance. Also in attendance were State Milk Regulators from Alaska, Delaware, Louisiana, Minnesota, and employees of Saputo Dairy Foods – White Bear Lake, MN. Opening remarks were provided on behalf of the Director of the Veterinary Services and Public Health Sanitation Directorate, APHC.

Participants activities included didactic lectures on vat pasteurization; High Temperature/Short Time (HTST) pasteurization principles, flow, and controls; pasteurization chart requirements and review; auxiliary equipment; and equipment testing. Additionally, participants reviewed case studies, designed and presented their own HTST pasteurization systems, visited a local dairy producer (Saputo Dairy Foods – White Bear Lake), and participated in equipment testing at the dairy producer with regulatory authorities.

The FDA Central Region Regional Milk Specialist and two other FDA Regional Milk Specialists provided training throughout the week and noted that all in attendance quickly grasped concepts allowing for more time to be spent on DoD specific concerns as well as more complex dairy processes.
Additional dairy-specific knowledge was provided throughout the week by State of Minnesota Department of Agriculture representatives. Without the support of the FDA, the State of Minnesota Department of Agriculture, and Saputo Dairy Foods – White Bear Lake, training and dairy audit certification requirements would not have been met leading to an increased potential for food-borne illnesses, potentially contaminated food items entering the food supply, and ultimately mission failure.

All three FDA instructors and the Saputo Dairy Foods – White Bear Lake management received Certificates of Appreciation from the Director of the Veterinary Service and Public Health Sanitation Directorate, APHC. The Senior Veterinary Warrant Officer Coin of Excellence was also presented to a Food Safety Officer for his logistical and administrative support of the PMO training course over the last three years while stationed at APHC.
Norfolk Veterinary Activity Provides Training to Navy Medical Center Residents

One of the highlights of being a Veterinary Corps Officer is the ability to extend influence beyond the scope of the veterinary clinic walls. An exciting opportunity for this arose at the end of 2017 when a program manager for the Navy Medical Center – Portsmouth (NMCP) Registered Nurse Anesthesia (RNA) Program reached out to the Norfolk Veterinary Activity (VETAC) about a potential partnership. Previous RNA graduates had identified a gap in their education when they were tasked with providing anesthetic care and monitoring for military working dogs (MWDs) in an emergency while deployed. A Naval Officer, and assistant professor for the RNA program, and the VETAC OIC were able to clarify and confirm the objectives of the training. Efforts were focused on familiarizing RNA students with MWD anesthetic procedures and protocols. The NMPC Clinical Investigations Department (CID) Animal Care Team under the supervision of the NMCP Attending Veterinarian, were also invited. The Attending Vet identified a need for her staff to have cross training for canine and feline patients. This training day provided a great way to reach multiple audiences and improve the VETAC’s relationship with NMCP.

RNA residents were provided with the Joint Theater Trauma System Clinical Practice Guidelines and the Veterinary Medical Standardization Board Anesthesia/Pain Management Standards as read ahead material. The Regional 64F and one of the clinical instructors for the First Year Veterinary Graduate Education Program Bragg Activity, were also consulted for words of wisdom and recommendations. A day of didactic lectures was developed, and each of the senior RNA residents was assigned a day in which they would observe and conduct anesthetic monitoring for a variety of patients with the Norfolk staff.

The didactic training day began with a tour of the VETAC. Lecture topics included comparative anatomy, vital signs, intubation and airway, equipment setup, and medication choices. More medically and technically dense lectures were taught by the Norfolk Veterinary Branch Chief, the GS Veterinary Medical Officer, and the VETAC OIC. Three junior enlisted 68Ts also rose to the occasion to present their knowledge and experience as animal care specialists. The hands-on portion was completed by Navy Lieutenants. The VETAC provided a mixture of cases, including an MWD procedure and abdominal/mass removal procedure. Each resident was given the opportunity to intubate, monitor anesthesia, and assist in recovery of the patients.

Overall, this was a great training opportunity for the RNA students, CID staff, and VETAC staff. It improved the relationship with the Navy Medical Center and set the groundwork for continued cross-training with the RNA program. Moving forward, the goal is to provide more hands-on training for the junior RNA students and get VETAC staff into the Navy Medical Center for familiarization in human medicine. This would be a great opportunity for other VCOs to improve the services they provide with their respective human medical facilities.
DVS Updates

AMEDD Captains Career Course graduated 10 Veterinary Corps and Veterinary Warrant Officers. The Top Graduate for the Veterinary Corps (right) received a Corps Chief's Coin and a complimentary membership from the Uniformed Veterinary Medicine Association (UVMA) to recognize her achievements.

The Reserve Corps AMEDD Captains Career (RC) Course graduates.
DVS Graduates
Join the Department of Veterinary Sciences in congratulating the newest
Animal Health Care Specialists!

Congratulations to the newest Animal Care Specialists in the Army! Welcome members of Class 184-18 and best of luck in your Army Career!!
A GS Management Analyst was presented an award in May at Public Health Activity-Fort Belvoir Headquarters. She is the Management Analyst for the whole of the Public Health Command Atlantic Veterinary Services and provides support and continuity to dozens of Veterinary Treatment Facilities (VTFs) across the region. She has supported the Fort Belvoir First Year Graduate Veterinary Education (FYGVE) Captains through multiple face-to-face trainings on business management, accounting, and how to work within the GVMP guidelines. Following an interactive lecture at Fort Belvoir on VTF budgeting for the FYGVE Captains, as well as multiple other Veterinary Corps Officers, the PHA-Fort Belvoir Commander presented an award for her outstanding service and dedication to the Public Health Command Atlantic, Public Health Activity Fort Belvoir, and the FYGVE program throughout her tenure.

A Veterinary Corps Officer is ‘pinned’ to the rank of Major by her son.
PHA-Carson, Fort Leavenworth Branch
Reserve Training Event

Event:
In May 2018 the Fort Leavenworth Branch provided Food Inspection and Animal Care training for the 445th MDVSS Reserve Unit from Independence, MO.

Background:
The 445th MDVSS sent a request for training in order to meet a portion of their Annual Training requirement.

Summary of Activities:
The PHA-Carson, Fort Leavenworth Branch team provided training to team members of the 445th MDVSS on 68T common tasks and 68R common tasks.

Following the training an AAR was conducted and coordination was made for potential future training opportunities.

Outcome:
The 445th obtained required training to meet a portion of their Annual Training requirements. Both units developed relationships that will be useful for future missions.
Clinical History and Gross Findings

A 10-year-old female spayed Border Collie presented with a three-month history of hematuria, straining to urinate and a left inguinal mass. On physical exam, a 10 cm, bilobed, firm, but freely moveable subcutaneous mass was palpated in the left inguinal region. A fine needle aspirate from the mass (figure 1) and three incisional biopsy samples (figure 2) were submitted for microscopic evaluation. CBC and serum chemistry were unremarkable. Urinalysis (both free-catch and cystocentesis) revealed hematuria; however, urinary culture and sensitivity did not result in any bacterial growth.

Figure 1: Photomicrograph of fine needle aspirate from the left inguinal mass. Diff-Quick stain; bar=50μm. Inset: Diff-Quick stain; bar=25μm.

What is your differential diagnosis?
Based on the results from the fine needle aspirate and incisional biopsies, an abdominal ultrasound and traumatic catheterization of the urinary bladder were subsequently performed. Ultrasound revealed a soft tissue mass near the trigone of the bladder. Cytologic samples from the traumatic catheterization were submitted for microscopic evaluation (Figure 3). The patient eventually developed left hind limb lameness, and radiographs were suggestive of bony metastasis, with evidence of osteolysis and periosteal reaction of the distal left femur. The patient was humanely euthanized; however, necropsy was not performed.

**Histopathologic and Cytologic Findings**

The fine needle aspirate from the left inguinal mass (figure 1) is characterized by individualized and clusters of neoplastic polygonal cells with pale, basophilic, occasionally vacuolated cytoplasm, a variable nuclear-to-cytoplasmic ratio, and single to multiple round to ovoid nuclei that are occasionally pleomorphic with prominent nucleoli. Multifocally, neoplastic cells occasionally contain pink to colorless homogenous to granular cytoplasmic inclusions. There is also marked anisokaryosis and anisocytosis. Mitotic figures, often bizarre in shape, are present. This cell population is suggestive of neoplastic transitional (urothelial) cells.

Histologically, the incisional biopsy from the left inguinal mass (figure 2) is consistent with a lymph node. Approximately 70% of the normal lymph node architecture is effaced by a metastatic neoplasm composed of polygonal epithelial cells (suggestive of urothelial cells) arranged in cords and trabeculae, often surrounded by a dense, desmoplastic stroma. Neoplastic cells have distinct cell borders, a moderate amount of eosinophilic granular cytoplasm, a round nucleus that is often vesiculate or has clumped chromatin, and one, occasionally prominent nucleolus. Anisocytosis and anisokaryosis are marked. The mitotic count averages 6 per 10 HPF (2.37mm²), with occasional bizarre mitoses. Neoplastic cells occasionally contain large, clear cytoplasmic vacuoles that peripheralize the nucleus (Melamed-Wolinska bodies). Neoplastic islands occasionally have central foci of necrosis. Neoplastic cells infiltrate through the capsule into the surrounding perinodal fat, and there are multiple foci of vascular and lymphatic invasion. By immunohistochemistry, neoplastic polygonal cells within the lymph node exhibit diffuse, strong membranous immunoreactivity to uroplakin III, confirming the diagnosis of urothelial carcinoma (transitional cell carcinoma).
The cytologic specimen obtained via traumatic catheterization of the urinary bladder (figure 3) is composed of large clusters and individualized neoplastic urothelial cells on a light blue background of peripheral blood. Neoplastic cells have a moderate amount of pale blue occasionally vacuolated cytoplasm, variable nuclear-to-cytoplasmic ratio, round to pleomorphic nuclei, numerous multinucleated cells are present, marked anisocytosis and anisokaryosis, and multiple mitotic figures, which are occasionally bizarre. Multifocally, neoplastic cells contain pink, homogenous to granular cytoplasmic inclusions similar to those described for the lymph node aspirate.

**Morphologic Diagnoses:**
- Left inguinal lymph node: Metastatic urothelial carcinoma.
- Cytologic specimen, traumatic catheterization of the urinary bladder: Urothelial carcinoma.

**Discussion**
Urothelial carcinoma, previously known as transitional cell carcinoma, is the most commonly diagnosed urinary bladder tumor of domestic animals, including dogs. It is derived from the transitional epithelium (urothelium) of the urinary tract.\(^1\) It typically affects older dogs (9-11 years old), and certain breeds, including Scottish terriers, and possibly Airdales, West Highland White terriers, wire hair fox terriers, Shetland sheepdogs, and beagles, appear to be predisposed. Exposure to lawn pesticides and other carcinogens has also been reported as a risk factor. The trigone of the urinary bladder is the most common site; however, any part of the bladder, the prostatic and lower urinary tract urethra may be involved.\(^2\) Typical clinical signs are non-specific and referable to urinary disease, including hematuria, pollakiuria, cystitis, dysuria, and abdominal pain; however, approximately 10% of dogs present with signs unrelated to the urinary system, such as lameness (due to bone metastasis), dyspnea (due to pulmonary metastasis), or subcutaneous masses (due to lymph node or skin metastasis).\(^1\) Both lymph node metastasis and (presumably) bony metastasis were present in this case.

Most urothelial carcinomas are high grade, and 50-90% are reported to metastasize. Metastasis is often to regional lymph nodes and lungs, but peritoneal implantation or lymphatic spread to the soft tissue and bones of the hind limbs or vertebrae is common, and cutaneous metastasis (typically perineal, inguinal, or ventral abdominal) is reported in 10% of dogs. Tumor seeding and implantation with surgery or FNA procedures is a well-documented phenomenon, and transepidermal spread via urine-scalded skin is a proposed pathogenesis for perineal cutaneous metastasis. The propensity of urothelial carcinoma to metastasize and its resistance to treatment makes this one of the most malignant tumors in veterinary medicine.\(^1,3,4\)

Cytologically, urothelial carcinoma is characterized by clustered and individual epithelial cells with features of atypia, and characteristic large pink cytoplasmic inclusions (Melamed-Wolinska bodies).\(^5\) Histologically, it is composed of pleomorphic to anaplastic transitional epithelial cells that often form papillary projections, infiltrate the underlying lamina propria, and invade lymphatic vessels; multinucleation, atypical nuclei, and bizarre mitoses are common.\(^2\) Histologically, the characteristic Melamed-Wolinska bodies tend to be colorless (or occasionally eosinophilic) and stain histochemically with PAS. A system of three classifications has been proposed which includes urothelial papilloma, low grade carcinoma, and high grade carcinoma. The degree of desmoplasia and inflammation, mitotic activity, nuclear pleomorphism, cellular morphology and patterns of growth can all be used to assess grade; however, the single most important criterion is invasion.\(^1\) In this case, although we did not receive any urinary bladder tissue, the presence of lymph node metastasis with extensive effacement of normal architecture implies a high grade and portends a poor prognosis.

Uroplakin III is a specific and sensitive immunohistochemical membranous marker for canine superficial urothelium and is often used to confirm the diagnosis of urothelial carcinoma.\(^1\) It does not
distinguish between neoplastic and non-neoplastic urothelium; however, expression may be lost in some high-grade neoplasms. Canine urothelium also expresses CK7, 8, 19, 19, 20 (markers of simple epithelia) and CK13 and 17 (markers of stratified epithelia). CK7 is sensitive but not specific for canine superficial urothelium, and anaplastic urothelial carcinomas may lose expression of CK7.\(^6\) Additionally, tumor-associated glycoprotein 72 (TAG-72) has been shown to be positive in 50% of canine urothelial carcinomas.\(^7\)

There has been recent work relating to the molecular characteristics of canine urothelial carcinoma. Initial data suggest that many of these neoplasms exhibit variable degrees of copy number imbalance. The gold standard for diagnosing such chromosomal abnormalities is fluorescence in situ hybridization (FISH); however, a recent study developed a multiplexed droplet digital PCR (ddPCR) to detect copy number imbalances characteristic to canine urothelial carcinoma, which could prove a useful noninvasive molecular diagnostic test.\(^8\)

In summary, this report describes a case of urothelial carcinoma in a dog that was initially diagnosed via fine needle aspirate when it metastasized to the inguinal lymph node.

**References:**


