Table of Contents

ACVR Program Committee and Administration
General Information
  • Registration Desk Hours
  • Wifi Info
  • Transportation Options
  • Hotel Parking
Access the App
Meal Options
Local Attractions
Hotel Floor Map
Agenda
Sponsors
Exhibitors
Abstracts
  • CT/MRI
  • Diagnostic Imaging
  • Nuclear Medicine
  • Radiation Oncology
  • Ultrasound
  • ZEWDIS
  • Artificial Intelligence
Scientific Exhibit Posters
Save the Date
**Program Committee**

Dr. Tony Pease, Education Director  
Dr. Keely Brewer, Chair 2023  
Dr. Shannon Holmes, Co-Chair Forum 2023 and Future Chair 2024  
Dr. Jessica Vallone, Past-Chair 2022  
Dr. Masahiro Murakami, Artificial Intelligence  
Dr. Nathan Nelson, Diversity, Equity, and Inclusion Chair  
Dr. Jamie Sage, CT MRI Society  
Dr. Grant Middleton, Ultrasound Society  
Dr. Erin Porter, Large Animal Diagnostic Imaging Society  
Dr. Robson Giglio, Zoological Exotic & Wildlife Diagnostic Imaging Society  
Dr. Beth Biscoe, Nuclear Medicine Society  
Lisa Chant, AVTDI Representative (Technician)  
Dr. Anthony Fischetti, Webmaster  
Libby Dietrich, Ex-Officio, Executive Administrator  
Brendan Leahy, Ex-Officio, Deputy Executive Administrator  
Janelle Witters, Ex-Officio, Meeting Manager  
Jannette Haven, Ex-Officio, Meeting Manager  
Dr. Allison Zwingenberger, Ex-Officio, ACVR President  
Dr. Ryan King, Ex-Officio, ACVR President-Elect  
Dr. Michelle Turek, Ex-Officio, ACVR-RO President  
Dr. Matt Cannon, Ex-Officio, ACVR Treasurer  
Dr. Tod Drost, Ex-Officio, ACVR Executive Director  

**Executive Council Officers/Directors (2023)**

Dr. Allison Zwingenberger, President  
Dr. Ryan King, President-Elect  
Dr. Federica Morandi, Past-President  
Dr. Matthew Cannon, Treasurer  
Dr. Leanne Magestro, Secretary  
Dr. Anthony Fischetti, Webmaster  
Dr. Michelle Turek, President, Recognized Specialty of Radiation Oncology  
Dr. Beth Biscoe, President, Recognized Specialty of Equine Diagnostic Imaging  
Dr. Jerry Owens, ACVR Historian  
Dr. Susanne Boroffka, ECVDI President  
Dr. Tony Pease, Ex-Officio, Education Director  
Dr. Stephanie Nykamp, Ex-Officio, Radiology/EDI Examination Director and EDI Examination Chair  
Dr. Michael Kent, Ex-Officio, Radiation Oncology Examination Chair  
Dr. Tod Drost, Executive Director  

**Council Members (2023)**

Dr. Lindsey Gilmour  
Dr. Jennifer Bouma  
Dr. Kemba Clapp  
Dr. Eric Hostnik  
Dr. Nathalie Rademacher  
Dr. Ryan Appleby  

**Recognized Specialty of Radiation Oncology Officers (2023)**

Dr. Michelle Turek, President  
Dr. Kim Selting, President-Elect  
Dr. Michele Keyerleber, Past-President  
Dr. Molly Holmes, Secretary  
Dr. Michael Kent, Radiation Oncology Examination Director  

**Recognized Specialty of Equine Diagnostic Imaging Officers (2023)**

Dr. Beth Biscoe, President  
Dr. Myra Barrett, Past President  
Dr. Meghann Lustgarten, Secretary
**Sheraton New Orleans Hotel Address**
500 Canal Street, New Orleans, LA 70130

**Check-In Time:** 4:00 PM  
**Check-Out Time:** 12:00 PM

**Conference Registration**
Registration is located on the 3rd floor, in the Napoleon Foyer

**Conference Registration Desk Hours**

<table>
<thead>
<tr>
<th>Date</th>
<th>Hours</th>
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<tbody>
<tr>
<td>Wednesday, October 25</td>
<td>6:00 am – 5:00 pm</td>
</tr>
<tr>
<td>Thursday, October 26</td>
<td>7:00 am – 5:00 pm</td>
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<tr>
<td>Friday, October 27</td>
<td>7:00 am – 5:00 pm</td>
</tr>
<tr>
<td>Saturday, October 28</td>
<td>7:00 am – 4:00 pm</td>
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</tbody>
</table>

**Emergency Medical Care**
There are several nearby hospitals and medical centers. The closest is Tulane Medical Center, which is approximately a 10-minute drive or 15-minute walk from the venue.

**Tulane Medical Center**
1415 Tulane Ave | New Orleans, LA 70112  
504-988-5623

**Wifi Information:**
Wifi Network Name: MarriottBonvoy_Conference  
Password: Vet2023

**Transportation Options**
The Sheraton New Orleans Hotel does not offer shuttle services; however, traditional car services such as Uber, Lyft, and Taxis are available.

**Hotel Parking**
- On-Site Parking  
  - Daily: $42  
- Valet  
  - Daily: $52  
- Electric Car Charging Station  
- Additional Parking Information  
  - Garage ceiling max 6’ 5”  
  - Tax not listed in fees:  
    - Valet: $16/0-3 hrs, $24/3-6 hrs, $30 6-12 hrs; Oversize: $62 + tax
1. Download the ACVR App

Scan the QR Code or go to the Apple App Store or Google Play and search for ACVR.

Install and open the app. Find your event icon in the Upcoming Events (bottom row) or search for 2023 ACVR Scientific Conference.

Tap the event icon to launch your event’s app.

2. Login to the App

If this is your first time accessing the mobile app, please create an account by entering the event code ACVR2023 followed by your name and email address.

If you already have an account, please log in using the credentials that were emailed to you upon account creation.

3. App Tips

Download the app before you go! Wi-Fi connection on-site can affect the functionality of the app.

Browse the event information and create a personal schedule by tapping on the star next to presentation titles.
The French Quarter in New Orleans is renowned for its rich history, vibrant atmosphere, and fantastic cuisine. The neighborhood boasts some of the best dining experiences not only in the city but in the entire United States. These fantastic restaurants are only suggestions, as many of these establishments may have long lines or may require reservations:

- **Café du Monde** – This is a must-visit for beignets and coffee. It's an iconic spot and a true New Orleans experience.
- **Commander's Palace** – Located a short streetcar ride from the French Quarter in the Garden District, this world-renowned restaurant serves upscale Creole fare in an opulent setting.
- **Galatoire's** – A century-old dining institution, Galatoire's offers traditional French-Creole cuisine. It's best known for classics like Turtle Soup and Bread Pudding.
- **Antoine's Restaurant** – The oldest continuously operating restaurant in the US, Antoine's is famed for inventing dishes like Oysters Rockefeller.
- **Arnaud's Restaurant** – Another classic Creole restaurant, Arnaud's offers specialties like Shrimp Arnaud and their famous Strawberry Soufflé.
- **Central Grocery** – Home of the original Muffuletta, this Italian-American deli is a must-visit for sandwich enthusiasts.
- **NOLA** – One of Emeril Lagasse's popular establishments, NOLA serves innovative New Orleans-style cuisine in a modern setting.
- **Cochon Butcher** – While it's slightly outside the French Quarter, it's worth the trip for meat lovers. Their sandwiches, particularly the Cubano, are renowned.
- **Green Goddess** – Tucked away in Exchange Place, this spot offers unique and flavorful dishes suitable for both vegetarians and carnivores.
- **Napoleon House** – Known for its Muffuletta and Pimm's Cup, this historic bar and eatery has been around for over a century.
- **The Court of Two Sisters** – Famous for its daily jazz brunch buffet, this spot serves a variety of Creole dishes in a charming courtyard setting.
- **Sylvain** – Set in a 19th-century carriage house, Sylvain offers a chic dining atmosphere with a menu that blends Southern and gastropub fare.
- **GW Fins** – For seafood lovers, GW Fins offers a menu that changes daily, based on the freshest available catches.
- **Killer Poboys** – This spot offers a modern twist on the traditional New Orleans sandwich, with unique fillings like glazed pork belly and seared shrimp.
- **Café Amelie** – A lovely spot with a beautiful courtyard, this cafe is known for its shrimp and grits, duck pasta, and other Creole-inspired dishes.

While these are some of the top traveler and personal recommendations, the French Quarter is filled with countless dining options!
The French Quarter, also known as the Vieux Carré, is the oldest neighborhood in New Orleans. With its rich history, vibrant culture, and unique architecture, there's no shortage of things to see and do. Here are some special highlights:

**Bourbon Street:** Famous for its lively bars and nightclubs, Bourbon Street is the heart of the French Quarter's nightlife. Visit at night for the music, drinks, and energetic crowds.

**Jackson Square:** This historic park is home to the St. Louis Cathedral, the Cabildo, and the Presbytère. Artists, performers, and musicians often gather here, making it a hub of activity.

**St. Louis Cathedral:** The oldest continuously active Roman Catholic cathedral in the U.S., it's an architectural gem and holds a lot of history.

**French Market:** This bustling marketplace offers a variety of goods, from souvenirs and crafts to fresh produce and local delicacies.

**Royal Street:** One street over from Bourbon, Royal Street is known for its art galleries, antique shops, and street musicians. The architecture and ironwork balconies are also a sight to behold.

**Live Music:** From jazz and blues to zydeco and rock, there's always music playing somewhere in the French Quarter. Spots like Preservation Hall, Fritzel's European Jazz Pub, and many others offer great live music experiences.

**Historic New Orleans Collection:** This museum and research center provides a deep dive into the history and culture of New Orleans.

**Take a Horse-Drawn Carriage Ride:** Learn about the history of the French Quarter while being chauffeured around by a mule-drawn carriage.

**Haunted History Tours:** New Orleans is known for its ghost stories and haunted past. Taking a guided tour can provide chilling tales of the city's history.

**Historic Bars:** From the Lafitte’s Blacksmith Shop Bar, believed to be the oldest structure used as a bar in the U.S., to the elegant Sazerac Bar, there are plenty of historic spots to enjoy a drink.

**Mardi Gras World:** While technically just outside the French Quarter, it offers a behind-the-scenes look at the world of Mardi Gras, including the floats and costumes.

**Steamboat Natchez:** Take a river cruise on the Mississippi aboard this historic steamboat, often accompanied by live jazz.

**Museums:** The French Quarter has several museums dedicated to different aspects of its history and culture. Some notable ones include the New Orleans Jazz Museum, The Museum of Death, and The Pharmacy Museum.

Remember that the French Quarter is a living, breathing neighborhood, and the joy of visiting often comes from the unexpected – a chance encounter with a street performer, a conversation with a local, or stumbling upon a hidden courtyard. So, while this list provides a starting point, there's much more to explore and discover on your own!
Beyond the French Quarter, there's a wealth of activities and sights to see. Here are some recommendations:

• **Garden District:** The Garden District is known for its well-preserved antebellum mansions and iconic St. Charles Avenue. A walking tour can help you delve into the architecture and history.

• **Cemetery Tours:** Due to the city's unique geography, many people are interred in above-ground vaults. The city's cemeteries, especially Lafayette Cemetery No. 1, are beautiful and historically rich.

• **Magazine Street:** Stretching for six miles, this street is home to an array of shops, restaurants, and art galleries.

• **Audubon Zoo & Aquarium:** Located in Uptown New Orleans, the zoo boasts an exotic mix of animals from around the globe. The Aquarium of the Americas, located near the French Quarter, showcases marine life from the Americas.

• **City Park:** One of the oldest urban parks in the U.S., it's home to the New Orleans Museum of Art, the Besthoff Sculpture Garden, and a host of outdoor activities.

• **WWII Museum:** The National WWII Museum offers a comprehensive look into America's involvement in the Second World War and is one of the most visited museums in the U.S.

• **Treme Neighborhood:** Known as America's oldest African-American neighborhood, Treme has a deep cultural and musical history.

• **Swamp Tours:** Explore the bayous and swamps surrounding New Orleans. You might spot alligators, birds, and other wildlife.

• **Catch a Show at Tipitina's:** Legendary for its music, Tipitina's is a place to enjoy live performances in an intimate setting.

• **The Bywater:** A vibrant, bohemian neighborhood filled with colorful homes, unique eateries, and a thriving arts scene.

• **Jazz Clubs on Frenchmen Street:** Though it's close to the French Quarter, Frenchmen Street has its own flavor with numerous jazz clubs and is less touristy than Bourbon Street.

• **Oak Alley Plantation:** A bit outside the city, this historic plantation offers a glimpse into the antebellum South with its majestic avenue of oaks.

• **New Orleans Jazz National Historic Park:** Delve deep into the history and culture of jazz in the city that birthed it.

• **The Levee Bike Path:** Rent a bike and ride along the Mississippi River levee for some unique views of the city and the river.

• **Eat and Drink Locally:** Beyond the French Quarter, neighborhoods like Uptown, the Marigny, and Mid-City offer a plethora of dining options ranging from po' boy sandwich shops to upscale Creole dining.

These are just a handful of things you can do in New Orleans. The city is rich in culture, history, and experiences waiting to be discovered. Whatever your interests, there's likely something in New Orleans that will captivate you.
We will be utilizing both the 3rd and 4th floors. For your convenience, please refer to these maps of the 1st, 3rd, and 4th floors.
Wednesday, October 25
7:00 pm
Introduction of New Diplomates Celebration in partnership with Varian, a Siemens Healthineers Company and Siemens Healthineers
Riverview Room
600 Decatur Street, Level 4

Thursday, October 26
5:30 pm
Varian, a Siemens Healthineers Company—FLASH Highlights for Radiation Oncology
Palace Café
605 Canal Street
RSVP required.

Thursday, October 26
7:00 pm
Antech Imaging Services Sponsored Event
Orpheum Theater and Double Dealer
129 Roosevelt Way
All welcome!

Friday, October 27
7:30 pm
MedVet/VetRad Sponsored Resident Mixer
Rex Room on Bourbon
401 Bourbon Street
RSVP required.

Friday, October 27
9:00 pm
Vet’s Choice Radiology’s Black and White Party
The Peacock Room
501 Tchoupitoulas Street
RSVP required.
**Wednesday, October 25, 2023**

*Times: CDT*

**General Session: Napoleon AB123 & AB Corridor**

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>6:00 am-5:00 pm</td>
<td>Conference Registration – 3rd Floor Napoleon</td>
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</tbody>
</table>
| 7:55 am-8:00 am  | **Ice Breaker**  
                  Allison Zwingenberger, DVM, DACVR, DECVDI                        |
| 8:00 am          | **Welcome with Program Chair Dr. Keely Brewer**                      |
| 8:00 am-9:00 am  | **Veterinary Diagnostic Imaging, Past & Present**  
                  Mason Savage, DVM, DACVR                                          |
| 9:00 am-10:00 am | **Artificial Intelligence Potpourri**  
                  Ryan Appleby, DVM, DACVR                                         |
| 10:00 am-10:30 am| **Break**                                                            |
| 10:30 am-11:30 am| **Experiences with Human Sonographers in Veterinary Mobile US & Telemed**  
                  Layla Shaikh, VMD, DACVR                                           |
| 11:30 am-12:30 pm| **Impact of PET on Racehorses**  
                  Kate Wulster Bills, VMD, DACVR, DACVR-EDI                      |
| 12:30 pm-2:00 pm | **Lunch**                                                            |
| 12:45 pm-1:45 pm | **Lunch and Learn with MedVet and VetRad**  
                  Things I Wish I Knew During My Residency—RSVP required             |
| 2:00 pm-3:00 pm  | **POV: Private Practice Residency Programs**  
                  Jennifer Brisson, DVM, DACVR                                     |
| 3:00 pm-3:30 pm  | **Break**                                                            |
| 3:30 pm-4:30 pm  | **POV: Academic Residency Programs**  
                  Kathryn Phillips, DVM, DACVR, DACVR-EDI                          |
| 4:30 pm-5:00 pm  | **Break**                                                            |
| 5:00 pm-6:30 pm  | **Exhibit Hall Opening Reception**  
                  Photobooth sponsored by Idexx from 4:30 pm to 6:30 pm             |
| 6:30 pm-7:00 pm  | **Traditional New Orleans Second Line**  
                  (parade to New Diplomate Introduction Reception)                  |
### AGENDA

**Wednesday, October 25, 2023**  
*Times: CDT*

<table>
<thead>
<tr>
<th>General Session; Napoleon AB123 &amp; AB Corridor</th>
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<tbody>
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</table>
| **Introduction of New Diplomates Celebration**  
(Riverview Room - 600 Decatur St 4 level, New Orleans, LA 70130) – Varian, a Siemens Healthineers Company/Siemens Healthineers presents Latest Innovations in Radiation Oncology Support & Advanced Diagnostic Imaging |
| Join ACVR as we welcome new Diplomates to our College!  
We're also happy to welcome our industry partner, **Varian, a Siemens Healthineers Company/Siemens Healthineers** who will be providing a brief presentation at this event. |

| Wednesday, October 25, 2023  
*Times: CDT* |
<table>
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<tbody>
<tr>
<td>Concurrent Session: Radiation Oncology: Borgne</td>
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<tr>
<td>6:00 am-5:00 pm</td>
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<tr>
<td><strong>Conference Registration – 3rd Floor Napoleon</strong></td>
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<td>8:00 am</td>
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<tr>
<td><strong>Welcome with Program Chair Dr. Kimberly Selting</strong></td>
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<tr>
<td>8:00 am-9:30 am</td>
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</tbody>
</table>
| **Planning Competition Discussion**  
**Tips and Tricks for Optimal Radiation Therapy Planning**  
*Belinda Thibodaux, ARRT(R)(T)’CMD* |
| 9:30 am-10:00 am                           |
| **Abstract Presentations**                 |
| 9:30 am:                                  |
| **Lily Thorsen**: Image-Guided Intensity-Modulated Radiation Therapy for The Treatment Of Canine Adrenal Tumors |
| 9:45 am:                                  |
| **Valerie Morales Coll**: Lattice SBRT For Palliation of Large Soft Tissue Sarcomas In Dogs |
| 10:00 am-10:30 am                         |
| **Break**                                 |
**AGENDA**

**Wednesday, October 25, 2023**  
*Times: CDT*

### Concurrent Session: Radiation Oncology: Borgne

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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>10:30 am-11:30 am</td>
<td><strong>Abstract Presentations</strong></td>
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<tr>
<td><strong>10:30 am:</strong></td>
<td>Natasha Spanos: Evaluating Clinical Response In 68 Dogs with Presumed Or Confirmed Intracranial Meningiomas Treated With Stereotactic Radiation Therapy</td>
</tr>
<tr>
<td><strong>10:45 am:</strong></td>
<td>Ber-in Lee: Local Immune Response to Radiation Therapy And Combined Myeloid Cell Targeted Therapy In A Dog Model Of Sinonasal Carcinoma</td>
</tr>
<tr>
<td><strong>11:00 am:</strong></td>
<td>Kim Selting: Impact of Dose Rate On Response Of Dogs With Sinonasal Neoplasia To Radiation Therapy</td>
</tr>
<tr>
<td><strong>11:15 am:</strong></td>
<td>Takamitsu Kato: SQAP Inhibits DNA Repair and Sensitizes Canine Cancer Cells to Radiation In Normal Oxia And Hypoxic Condition</td>
</tr>
</tbody>
</table>
| 11:30 am-12:30 pm | Current Status of VRTOG Adverse Event Scoring System Version 2.0  
*Valerie Poirier, DVM, DACVIM (Oncology), DACVR-RO*
| 12:30 pm-2:00 pm | Lunch                                                                 |
| 12:45 pm-1:45 pm | Lunch and Learn with MedVet and VetRad  
*Things I Wish I Knew During My Residency—RSVP Required* |
<p>| 2:00 pm-3:00 pm | <strong>Abstract Presentations</strong>                                            |
| <strong>2:00 pm:</strong>  | Cory Wakamatsu: Outcomes Following Radiation Therapy for Dogs with Pericardial Effusion Secondary To Suspected Cardiac Hemangiosarcoma |
| <strong>2:15 pm:</strong>  | Whitney Wyatt: Salivary Analysis in Dogs Treated with Definitive Radiation Therapy For Head And Neck Cancer |
| <strong>2:30 pm:</strong>  | Yen-Hao Lai: Effects of Half Body Irradiation on Remission And Survival For Dogs With High Grade Lymphoma |
| <strong>2:45 pm:</strong>  | Valerie Poirier: Clinical Outcome Of 27 Dogs Treated with Radiation Therapy for Infiltrative Lipoma |
| 3:00 pm-3:30 pm | Break                                                                 |</p>
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<tr>
<th>Time</th>
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<tbody>
<tr>
<td>3:30 pm-4:30 pm</td>
<td><strong>Abstract Presentations</strong></td>
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<tr>
<td><strong>3:30 pm:</strong></td>
<td>Tracy Gieger: Use of Radiation Therapy (2 Gy X 4) To Treat Feline</td>
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<td></td>
<td>Chronic Enteropathies</td>
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<td><strong>3:45 pm:</strong></td>
<td>Kim Selting: Low Versus Standard Dose Rate Palliative External Beam</td>
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<td></td>
<td>Radiation Therapy for Canine Appendicular Osteosarcoma</td>
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<tr>
<td>4:00 pm-5:00 pm</td>
<td><strong>RO Business Meeting</strong></td>
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<td></td>
<td>Michelle Turek, President</td>
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<tr>
<td>5:00 pm-6:30 pm</td>
<td><strong>Exhibit Hall Opening Reception</strong></td>
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<td>(Riverview Room - 600 Decatur St, 4 level, New Orleans, LA 70130)</td>
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<td></td>
<td>Varian, a Siemens Healthineers Company/Siemens Healthineers presents</td>
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<td></td>
<td>Latest Innovations in Radiation Oncology Support &amp; Advanced Diagnostic</td>
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<td>Imaging</td>
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</table>

Join ACVR as we welcome new Diplomates to our College! We’re also happy to welcome our industry partner, **Varian, a Siemens Healthineers Company/Siemens Healthineers** who will be providing a brief presentation at this event.
**AGENDA**

**Wednesday, October 25, 2023**  
*Times: CDT*

<table>
<thead>
<tr>
<th>Concurrent Session: Bayside ABC—Technicians hosted by AVTDI</th>
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</table>
| **9:00 am-10:00 am** | **Proactive Imaging for Technicians**  
*Hollye Felps, LVT, RT(MR), VTS(DI)*  |
| **10:00 am-10:30 am** | **Break**  |
| **10:30 am-11:30 am** | **CT vs. MRI: What Do They Do, How Different, and When Should They Be Used?**  
*Matt Winter, DVM, DACVR*  |
| **12:30 pm-2:00 pm** | **Lunch**  |
| **2:00 pm-3:00 pm** | **Abdominal Sonography: Interesting Cases**  
*Layla Shaikh, VMD, DACVR*  |
| **3:30 pm-4:30 pm** | **Foundations of Fluoroscopy**  
*Jamie Rechy, DVM, DACVR*  |

**Thursday, October 26, 2023**  
*Times: CDT*

<table>
<thead>
<tr>
<th>General Session: Napoleon AB123 &amp; AB Corridor</th>
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<td><strong>7:00 am-5:00 pm</strong></td>
<td><strong>Conference Registration – 3rd Floor Napoleon Exhibit Hall open</strong></td>
</tr>
</tbody>
</table>
| **7:55 am-8:00 am** | **Ice Breaker**  
*Allison Zwingenberger, DVM, DACVR, DECVDI*  |
| **8:00 am-10:00 am** | **Conference Keynote: “Much More than Models” - 3D Printing in Veterinary Medicine**  
*Fred Wininger, VMD, MS, DACVIM (Neurology)*  |
| **10:00 am-10:30 am** | **Break with Exhibitors**  |
| **10:00 am-10:30 am** | **Poster Viewing – Comfort Lounge/Registration**  |
| **10:30 am-11:30 am** | **ACVR Annual Business Meeting**  
*ACVR Diplomates only*  |
| **11:30 am-12:30 pm** | **CT/MR Keynote: Emerging Techniques for Large Animal CT Imaging: Dual-Energy, Subtraction, Sparse-View**  |
### Thursday, October 26, 2023

**Times:** CDT

<table>
<thead>
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<tr>
<td>12:30 pm-2:00 pm</td>
<td><strong>Lunch</strong></td>
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<td>2:00 pm-3:00 pm</td>
<td><strong>DEI Keynote: How to Support Your Gender Diverse Team members</strong></td>
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<td></td>
<td><em>Ewan Wolff, PhD, DVM, DACVIM(SAIM)</em></td>
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<td><em>Sponsored by MedVet/VetRad</em></td>
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<tr>
<td>3:00 pm-3:30 pm</td>
<td><strong>Volunteership with ACVR - Dr. Ryan King</strong></td>
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<td><em>VRU’s Future—Dr. Eric Hostnik</em></td>
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<tr>
<td>3:30 pm-4:00 pm</td>
<td><strong>Break with Exhibitors</strong></td>
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<tr>
<td>3:50 pm-4:00 pm</td>
<td><strong>Presentation of Bernstein Award and Distinguished Service Award</strong></td>
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<td>4:00 pm-5:00 pm</td>
<td><strong>RO/CT CBCT Tips &amp; Tricks</strong></td>
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<td><em>Robert T. O’Brien, DVM, MS, DACVR; Kimberly Selting, DVM, MS, DACVM(Oncology), DACVR-RO</em></td>
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<tr>
<td>6:00 pm-10:00 pm</td>
<td>Antech Imaging Services Sponsored Event</td>
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<td><em>Orpheum Theater - 129 Roosevelt Way, New Orleans, LA 70112</em></td>
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### Thursday, October 26, 2023

**Times:** CDT

**Concurrent Session—Radiation Oncology: Borgne**

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<tr>
<td>11:30 am-12:30 pm</td>
<td><strong>RO Keynote</strong></td>
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<tr>
<td></td>
<td><strong>Ultra-High Dose Rate (FLASH) Radiotherapy: Improving Outcomes by Controlling Space &amp; Time</strong></td>
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<tr>
<td></td>
<td><em>Keith Cengel, MD, PhD</em></td>
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<tr>
<td>12:30 pm-1:45 pm</td>
<td><strong>Lunch</strong></td>
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<tr>
<td>1:45 pm-2:30 pm</td>
<td><strong>SOTA: Veterinary Radiation Oncology: The Business Behind the Medicine</strong></td>
</tr>
<tr>
<td></td>
<td><em>Siobhan Haney, VMD, MS, DACVR-RO, MBA</em></td>
</tr>
<tr>
<td>2:30 pm-3:30 pm</td>
<td><strong>Panel: The Many Faces of the Business of Veterinary Radiation Oncology</strong></td>
</tr>
<tr>
<td></td>
<td><em>Ira Gordon, DVM, DACVR-RO; Siobhan Haney, VMD, MS, DACVR-RO, MBA; Jayme Looper, DVM, DACVR-RO, Neal Mauldin, DVM, DACVIM (IM&amp;O), DACVR-RO</em></td>
</tr>
</tbody>
</table>

[www.acvr.org](http://www.acvr.org)
## AGENDA

**Thursday, October 26, 2023**  
*Times: CDT*

### Concurrent Session - Radiation Oncology: Borgne

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
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</thead>
<tbody>
<tr>
<td>3:30 pm-4:00 pm</td>
<td>Break with Exhibitors</td>
</tr>
<tr>
<td>3:50 pm-4:00 pm</td>
<td>Presentation of Bernstein Award and Distinguished Service Award</td>
</tr>
</tbody>
</table>
| 4:00 pm-5:00 pm | **RO/CT CBCT: Tips & Tricks – General Session**  
  *Robert T. O’Brien, DVM, MS, DACVR; Kimberly Selting, DVM, MS, DACVIM(Oncology), DACVR-RO*
| 5:30 pm-7:30 pm | **Varian, a Siemens Healthineers Company – FLASH Highlights for Radiation Oncology**  
  *Palace Cafe - 605 Canal Street, New Orleans, LA 70130* |
| 7:00 pm-10:00 pm | **Antech Imaging Services Sponsored Event**  
  *Orpheum Theater - 129 Roosevelt Way, New Orleans, LA 70112* |

**Friday, October 27, 2023**  
*Times: CDT*

### General Session: Napoleon AB123 & AB Corridor

<table>
<thead>
<tr>
<th>Time</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00 am-5:00 pm</td>
<td><strong>Conference Registration – 3rd Floor Napoleon</strong></td>
</tr>
</tbody>
</table>
| 7:55 am-8:00 am | **Ice Breaker**  
  *Allison Zwingenberger, DVM, DACVR, DECVDI* |
| 8:00 am-9:00 am | **ZEWDIS Keynote**  
  *Relationship with Radiologists*  
  *Copper Aitken-Palmer, DVM, PhD, DACZM* |
| 8:00 am-9:00 am | **DI and EDI Residency Director Open Panel**  
  *Stephanie Nykamp, DI and EDI Exam Director; Allison Lee, DI RSEC Chair; Kathryn Phillips, EDI RSEC Chair* |
| 9:00 am-10:00 am | **Ultrasound Keynote**  
  *Professional Certification: Present and Future - An Inteleos Perspective*  
  *Dale Cyr, MBA, CAE, CEO* |
| 10:00 am-10:30 am | **Break with Exhibitors**                                            |
| 10:30 am-12:30 pm | **Image Interpretation Session**  
  *Moderator: Ben Young, DVM, MS, DACVR*  
  *Panelists: Silke Hecht, Dr. Med. Vet., DACVR, DECVDI; Kathryn Phillips, DVM, DACVR, DACVR-EDI; Grant Middleton, DVM, DACVR; Mason Savage, DVM, DACVR* |
### Friday, October 27, 2023
*Times: CDT*

#### General Session: Napoleon AB123 & AB Corridor

<table>
<thead>
<tr>
<th>Time</th>
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</thead>
<tbody>
<tr>
<td>12:30 pm-2:00 pm</td>
<td>Lunch</td>
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</tbody>
</table>
| 2:00 pm-3:00 pm | LADIS Keynote  
**Emerging Techniques for Large Animal CT Imaging: Dual-Energy, Subtraction, Sparse-View**  
*Holly Stewart, VMD, DACVS (LA)* |
| 3:00 pm-3:30 pm | Break with Exhibitors                                               |
| 3:30 pm-5:30 pm | Artificial Intelligence Panel  
**Current Use of AI in Veterinary Diagnostic Imaging: A Panel Discussion with Industry Experts**  
*Moderator: Ryan Appleby, DVM, DACVR  
Panelists: Neil Shaw, DVM, DACVIM; Andrew Weissman, VMD, DACVR; John Craig, CEO; Diane Wilson, DVM, DACVR; Seth Wallack, DVM, DACVR* |
| 5:30 pm-6:30 pm | Exhibit Hall Power Hour – Closing of Exhibit Hall                   |
| 6:00 pm-8:00 pm | Meet the Resident Program Event                                     |
| 7:30 pm-9:30 pm | MedVet/VetRad Sponsored Resident Mixer—**RSVP Required**  
*Location: Rex Room on Bourbon Street* |
| 9:00 pm-11:00 pm | Vet’s Choice Radiology Sponsored Event—**RSVP Required**  
*Location: The Peacock Room* |

#### Concurrent Session: Borgne

<table>
<thead>
<tr>
<th>Time</th>
<th>Abstract Presentations</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:15 am-9:00 am</td>
<td></td>
</tr>
</tbody>
</table>
8:15 am: **Monique Mayer**: Blood and hand surface lead in veterinary workers using lead shielding during diagnostic radiography  
8:30 am: **Pablo Espinosa Mur**: Radiographic Findings In Dogs with 360 Degrees Gastric Dilatation and Volvulus |
**Friday, October 27, 2023**  
*Times: CDT*

### Concurrent Session: Borgne

<table>
<thead>
<tr>
<th>Time</th>
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<tbody>
<tr>
<td>9:00 am-9:45 am</td>
<td>Abstract Presentations</td>
</tr>
<tr>
<td>9:00 am:</td>
<td><strong>Thomas Monto:</strong> A “Gullwing Sign” On Magnetic Resonance Imaging of Extradural Spinal Tumors Allows Prioritization of Round Cell Neoplasia</td>
</tr>
<tr>
<td>9:15 am:</td>
<td><strong>Alexandra Scharf:</strong> Diffuse Tensor Imaging of the Plantar Nerves in the Horse</td>
</tr>
<tr>
<td>9:30 am:</td>
<td><strong>Christy Buckley:</strong> CT Hepatic Attenuation in Dogs with Diabetes Mellitus To Evaluate For Suspected Hepatic Steatosis</td>
</tr>
<tr>
<td>9:45 am:</td>
<td><strong>Tobias Schwarz:</strong> Comparison of Radiological Interpretation made by Veterinary Radiologists and AI Software for Canine and Feline Radiographic Studies</td>
</tr>
<tr>
<td>10:00 am-10:30 am</td>
<td>Break</td>
</tr>
</tbody>
</table>
| 10:30 am-12:30 pm | Image Interpretation Session  
*General Session* |
| 12:30 pm-2:00 pm | Lunch                                                                |
| 2:00 pm-3:00 pm | Abstract Presentations                                               |
| 2:00 pm:        | **Catana Capps:** Ultrasonographic Appearance of The Spleen of Growing Kittens Using A High Frequency Linear Transducer |
| 2:15 pm:        | **Thiago Rinaldi Muller:** The Abdominal Ultrasonographic Findings of Cats With Feline Infectious Peritonitis: An Update |
| 2:30 pm:        | **Katherine Neal:** Prevalence and Association of Pancreatitis in Dogs with Hypercalcemia |
| 2:45 pm:        | **Atsushi Toshima:** Ultrasonographic Evaluation of Pleural Metastasis in Cats With Pulmonary Carcinoma |
# AGENDA

## Saturday, October 28

Times: CDT

### General Session: Napoleon AB123 & AB Corridor

<table>
<thead>
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<th>Time</th>
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<td>7:55 am-8:00 am</td>
<td>Ice Breaker&lt;br&gt;Allison Zwingenberger, DVM, DACVR, DECVI</td>
</tr>
<tr>
<td>8:00 am-9:30 am</td>
<td><strong>Nuclear Medicine Panel</strong>&lt;br&gt;Moderator: Samantha Loeber, DVM, DACVR, DACVR-EDI&lt;br&gt;Panelists: Lynn Griffin, DVM, MS, DACVR, DACVR-RO; James Karnia, DVM, DACVR; Amy LeBalc, DVM; Kate Wulster Bills, VMD, DACVR, DACVR-EDI; David Vail, DVM, MS, DACVIM (Oncology)</td>
</tr>
<tr>
<td>9:30 am-9:45 am</td>
<td>Alexandra Belotta (Nuclear Medicine Resident Winner)&lt;br&gt;Comparison of sedation and general anesthesia protocols for 18F-FDG-PET/CT studies of dogs and cats: musculature uptake and worker radiation dose</td>
</tr>
<tr>
<td>9:45 am-10:00 am</td>
<td>Kosuke Kinoshita (Artificial Intelligence Non-Resident Winner)&lt;br&gt;Investigation of the accuracy and contributing factors of AI-based diagnosis of urothelial carcinoma in canine abdominal radiography</td>
</tr>
<tr>
<td>10:00 am-10:30 am</td>
<td>Break</td>
</tr>
<tr>
<td>10:30 am-10:45 am</td>
<td>Seng Fong Lau (Diagnostic Imaging Resident Winner)&lt;br&gt;Computed tomographic characteristics of anatomical variations of external and internal jugular veins in dogs</td>
</tr>
<tr>
<td>10:45 am-11:00 am</td>
<td>Andy Leffler (Diagnostic Imaging Non-Resident Winner)&lt;br&gt;Extramural compression and dorsoventral narrowing of the left principal bronchus in lateral recumbency related to canine body conformation</td>
</tr>
<tr>
<td>11:00 am-11:15 am</td>
<td>Celine Giron (CT MR Resident Winner)&lt;br&gt;Assessment of pulmonary parenchymal and vascular enhancement with thoracic computed tomography angiography in healthy cats</td>
</tr>
<tr>
<td>11:15 am-11:30 am</td>
<td>Maria (Ria) Watko (CT MR Non-Resident Winner)&lt;br&gt;Computed tomographic and magnetic resonance imaging features of aortic body paragangliomas in 36 dogs</td>
</tr>
<tr>
<td>11:30 am-11:45 am</td>
<td>Masahiro Murakami (CT MR Dip Winner)&lt;br&gt;Computed tomographic hepatic volumetry in dogs with primary hypoplasia of portal vein</td>
</tr>
</tbody>
</table>
# AGENDA

**Saturday, October 28**  
*Times: CDT*

## General Session: Napoleon AB123 & AB Corridor

<table>
<thead>
<tr>
<th>Time</th>
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</table>
| 11:45 am-12:00 pm | Cristina Geston *(Ultrasound Resident Winner)*  
*Ultrasound-guided small intestine mucosal aspirates aid in the diagnosis of feline lymphoma using PCR for Antigen Receptor Rearrangement: 60 cases* |
| 12:00 pm-1:30 pm | Lunch                                                                |
| 1:30 pm-2:45 pm  | Honorable Mention Abstracts                                         |
| 1:30 pm-1:45 pm  | Alex zur Linden  
*Assessment of An Ultrasound Skill Simulator in Teaching Basic Ultrasound Use* |
| 1:45 pm-2:00 pm  | William Stevenson  
*Ultrasonographic Evaluation of Splenic Nodules and Masses With B-Flow Interrogation Correlates to Cytologic Or Histopathologic Characterization As Benign Or Malignant* |
| 2:00 pm-2:15 pm  | Steven Magidenko  
*Evaluation of Pneumorrhachis and Intraforaminal Gas Detected by Contrast-Enhanced Computed Tomography in Dogs Without Trauma* |
| 2:15 pm-2:30 pm  | Jorge Santana Mignucci  
*Computed Tomographic Features of Presumed Normal Hepatic Lymph Nodes In 87 Dogs* |
| 2:30 pm-2:45 pm  | Aitor Gallastegui Menoyo  
*Splenic Thickness Ratio in CT as a Predictor of Splenic Malignancy in Dogs with Generalized Splenopathy* |
| 2:45 pm-3:15 pm  | Honorable Mention Abstracts                                         |
| 3:15 pm-3:30 pm  | Susannah Lillis  
*Veterinary Radiologist Use of Eye Protection Away from Work* |
| 3:30 pm-3:45 pm  | Stephanie Stromberg  
*Radiographic Appearance of The Cecum in Dogs* |
| 4:00 pm-4:15 pm  | Nicholas Goody  
*Ocular Biometry in Rabbits Using Computed Tomography* |
| 4:15 pm-4:30 pm  | Closing Remarks                                                     |
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Beignets | DEI Keynote

Introduction of Diplomates Celebration | Lunch Symposium

www.acvr.org
Antech Imaging Services
17620 Mt Herrmann St
Fountain Valley, CA, 92708
https://info.antechimpagingservices.com/

Telemedicine
Booth #101/200

At Antech Imaging Services, providing a Better World for Pets is at the core of everything we do. By creating a worldwide network of telemedicine specialists who continually collaborate on cases in real time, AIS has built a team that works as a cohesive unit to provide unparalleled support to veterinarians and their patients. We pride ourselves on fostering a culture of mutual respect, lifelong learning, and support for our family of specialists, allowing each team member to thrive, have the quality of life, career satisfaction, and growth they are looking for.

Asteris
7405 TransCanada, Suite 100
Montreal, QC, H4T 1Z2
www.asteris.com

Telemedicine, PACS/RIS
Booth #108

Asteris is a leading provider of PACS, RIS and Teleconsultation technology solutions for veterinary practices. Our Keystone software suite, designed by veterinarians, offers a patented approach to digital image management, advanced teleconsultation workflows, and integrations with practice management software systems. Our solution lets you prioritize patient care, not technology.

Brown’s Medical Imaging
14315 C Circle
Omaha, NE, 68144
www.brownsmedicalimaging.com

Equipment
Booth #113

Brown’s Medical Imaging has specialized in the sales and service of medical imaging equipment for over 25 years. Offering new and remanufactured CT, MRI and Digital X-ray systems for the veterinary community. Equipment available for both large and small animal applications. ISO certified remanufacturing of CT and MRI systems.
Talkingvet provides the industry's most accurate veterinary dictation with a variety of configurations to match any environment. We accommodate onsite, mobile, Windows and macOS options with our dictation suite for one low price.

Simple and easy to use. Stop by and try for yourself.

From our #1 selling Piloter tablet ultrasound to our Philips EPIQ, Core Imaging has a solution for every imaging need, and we are committed to supporting you beyond the sale. Our CoreVu technology connects you with sonographers and customer service instantaneously. This is a must-see technology!

CorridorVet is a modern ACVR-Radiologist owned and developed PACS and collaborative telespeciality software. This is a zero-footprint software is made for radiologists by radiologists.

Unlike others, CorridorVet enables and encourages integration and collaboration by allowing for single-user logins for all uses. This allows clients to access both mobile and remote reports from a single login and streamlines access to specialists and secondary providers for overflow and vacation coverage.
Dechra
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Overland Park, KS, 66211
www.dechra-us.com

Pharmaceutical
Booth #107

Dechra Veterinary Products offers a wide range of veterinary approved products. Our companion animal portfolio focuses on endocrinology, oncology, dermatology, ophthalmology, anesthesia, fluid therapy, pain management, lameness, joint health support, and dental care. Dechra’s equine portfolio includes anesthesia, pain management, fluid therapy, reproductive health, dermatology, regenerative therapy, and joint support products. Our newest brand is Zenalpha® (medetomidine and xatinoxan hydrochlorides injection) for use in dogs. For more information, please visit www.dechra-us.com or call (866) 933-2472.

Dogwood Veterinary Specialty
1234 Powers Ferry Common
Marietta, GA, 30067
dogwood.vet

Services
Booth# 312

Dogwood Veterinary Specialty is a locally owned referral center in Marietta, Georgia. We are rapidly expanding and offer 24/7 emergency care plus internal medicine, oncology, surgery, cardiology and critical care service.

Dragon Veterinary Canada Ltd.
208-620 Nine Mile Drive
Bedford, Nova Scotia, B4A 0H4
https://www.dragonveterinary.com

Services, Telemedicine, Voice-to-Text Software
Booth #203

Dragon Veterinary is the leading voice-to-text software developed by veterinarians for veterinarians. It provides a fully integrated solution that helps veterinary professionals navigate medical decision-making and treatment plans entirely by voice and integrates seamlessly with your practice management software of choice, allowing you to complete more accurate and more detailed notes in less than half the time! Dragon Veterinary is more than just dictation, it is a way for veterinarians to get back to their roots and spend more time doing what they do best: caring for their very special patients.
**Esaote North America**  
11907 Exit Five Parkway  
Fishers, IN, 46037  
[www.esaoteusa.com](http://www.esaoteusa.com)

**Equipment**  
**Booth #310**

Esaote North America is an Italian medical device manufacturer with a robust dedicated Veterinary portfolio designed to meet the unique demands of veterinary practice. Esaote draws upon almost 40 years of experience in providing scalable, fully featured diagnostic imaging solutions, including ultrasound and Dedicated MRI, without compromising superior image quality.

---

**Ethos Veterinary Health**  
29229 Canwood St., Suite 100  
Agoura Hills, CA, 91301  
[https://www.ethosvet.com/](https://www.ethosvet.com/)

**Recruiting**  
**Booth #205**

Ethos is a veterinary health company with hospitals across the U.S. providing advanced medical care for pets. Our approach includes a focus on transformative science, continuous learning and growth for team members, and collaboration. For more information, visit ethosvet.com. Ethos Discovery is a 501(c)(3) nonprofit incubator of scientific innovation that seeks to improve health outcomes in pets and humans with complex medical problems, including cancer. For more information, please visit ethosdiscovery.org.

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**Golden Hour**  
2024 Rayford Rd.  
Spring, TX, 77386  
[www.goldenhourvet.com](http://www.goldenhourvet.com)

**Recruiting**  
**Booth #307**

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IDEXX Telemedicine
9200 SE Sunnybrook Blvd.
Clackamas, OR 97105
https://www.idexx.com/en/

Telemedicine
Booth #100, 102

IDEXX Telemedicine Consultants is a global community of veterinary specialists who use our expertise to provide critical information to veterinarians. Our veterinary specialists leverage IDEXX's innovative technology, support, and collective knowledge to support outstanding patient care. Explore what IDEXX Telemedicine can do for your career.

Los Angeles Animal Specialty, Emergency & Rehabilitation (LAASER)
2500 N San Fernando Rd
Los Angeles, CA, 90065
https://laaser.vet/

Recruiting
Booth #215

LAASER is a multi-disciplinary specialty hospital located in the heart of Los Angeles. Clinical specialties include: Emergency and Critical Care, Neurology, Surgery, Internal Medicine, Cardiology, Clinical Nutrition, Dentistry, Anesthesia, and Integrative Medicine/Rehabilitation. Imaging modalities include: MRI (Siemens Avanto 1.5T), CT (BodyTom by Neurologica - Samsung subdivision), fluoroscopy, ultrasound (Canon Aplio, GE e95, plus more).

LSU School of Veterinary Medicine
LSU School of Vet Med, 2307 Skip Bertman Dr.
Baton Rouge, LA, 70803
www.lsu.edu/vetmed

Recruiting
Booth #214

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- Diagnostic Imaging/Radiology
- Radiation Oncology
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8354 Northfield Blvd., Suite 3700 Unit 317
Denver, Colorado, 80238
https://www.mt3.co.jp/en/

**Pharmaceutical**
**Booth #300**

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400 Preston Rd Ste 400
Plano, TX, 75093
www.medQ.com

**Software**
**Booth #204**

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**MedVet**
350 E. Wilson Bridge Road
Worthington, OH, 43085
medvet.com

**Recruiting**
**Booth #105**

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**MYVET IMAGING**
81 Ruckman Road, Unit A
Closter, New Jersey, 07624
[www.myvetimaging.com](http://www.myvetimaging.com)

**Equipment**
**Booth #304**

MyVet Imaging, specializes in veterinary digital imaging offering a broad range of imaging products ranging from feline, canine and large animal CMOS intraoral sensors to high-end digital companion animal radiographic equipment to computed tomography systems.

**Nuvodia**
2818 N Sullivan Rd, Suite 120
Spokane Valley, Wa, 99214
[nuvodia.com](http://nuvodia.com)

**Services, Technology**
**Booth #302**

Nuvodia Technology Services is a Healthcare IT managed-services provider specializing in delivering integrated Radiology Informatics solutions. For more than 20 years, Nuvodia has partnered with industry-leading technology vendors to deliver cloud-based RIS, PACS, and VR solutions focused on Radiologist efficiency. Nuvodia combines this cloud technology with exceptional 24x7x365 application management and Help Desk support to create a completely outsourced solution. In addition, Nuvodia offers workflow and strategic consulting focused on solving today's radiology workflow challenges.

**PetCure Oncology**
2333 Waukegan Road, Suite 245
Bannockburn, Illinois, 60015
[https://petcureoncology.com/](https://petcureoncology.com/)

**Services**
**Lanyard Sponsor**

PetCure Oncology manages a national network of radiation therapy providers that specialize in stereotactic radiation (SRS/SRT). Veterinarians and pet owners alike have come to trust PetCure's comprehensive, collaborative approach to cancer care. That’s why our clinical team of 11 board-certified radiation and medical oncologists have treated more than 7,000 dogs and cats with radiation therapy since 2015.
RAD Technology Medical Systems
20801 Biscayne Blvd, Suite 403
Aventura, Florida, 33180
http://www.radtechnology.com

Modular veterinary radiotherapy vaults and clinics
Booth #115

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Remedy View
15405 La Arboleda Way
Morgan Hill, CA, 95037
http://www.remedyview.com

Telemedicine
Booth #315

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Users are veterinary radiologists reading online for their clients directly, and simply pay a small fee per completed report.

The system is compatible with any clinic or hospital that can send DICOM images and with any desktop viewing software for reading. Free setup, storage and ongoing support is provided to radiologists and their clients.

Samsung
14 Electronics Ave
Danvers, MA, 01923
https://www.samsunghealthcare.com

Equipment
Booth #110, 112

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Malvern, PA 19355
https://www.siemens-healthineers.com/

Equipment
Booth #104

Combining the strength of our people, knowledge, and portfolio, we passionately pursue our single and unifying purpose: We pioneer breakthroughs in healthcare. For everyone. Everywhere. We've been pushing the boundaries in medical technology for more than 125 years. Combined with the pioneering history of Varian our breakthroughs now span imaging, diagnostics, and cancer therapy. We have unique strengths in patient twinning, precision therapy as well as digital, data, and AI that set us apart and enable us to actively shape the transformation of healthcare. We will continue to build on these strengths to help fight one of the world’s most threatening diseases: cancer. Discover our comprehensive portfolio for radiation therapy and find out how we strive to create a world without fear of cancer.

Sedecal USA Inc/Vet-Ray Technology by Sedecal
7555 N. Caldwell Ave
Niles, Illinois, 60714
Vetray.com

Equipment
Booth #301

Vet-Ray Technology by Sedecal: Sedecal manufacturer of Veterinary specific X-ray products has grown to be the world’s largest Veterinary provider of over 20 different Digital, Dental and Analog configurations for small and large animal applications. Sedecal specializes in products for Companion Animal, Equine, Zoo Animals and Universities across the world.

Sound
3200 Lionshead Ave
Carlsbad, CA, 92010
http://www.soundvet.com/

Equipment
Booth #303

SOUND® is based in Carlsbad, CA, and produces the most widely accepted and used digital radiography, ultrasound, and PACS systems in the veterinary industry. SOUND® also holds leadership positions in ultrasound, digital radiography, PACS, Laser Therapy, CT and education. SOUND’s Academy of Veterinary Imaging has three locations and has conducted over 14,000 ultrasound trainings.
**Timeless Veterinary Systems**  
614 North River Road, Suite E  
Charlottetown, Prince Edward Island, C1E 1K2  
timelessveterinary.com

**Services, Telemedicine**  
Booth #206

The Cloud-Based Management System for Telemedicine and Referrals  
A new and innovative approach to referral management and telemedicine that streamlines and simplifies the entire referral process and improves the overall referral experience. The system is designed to empower independent consultants with an affordable first-class system, but powerful enough to support a network of specialists around the world.

---

**United Veterinary Care**  
4360 Northlake Blvd, Suite 214  
Palm Beach Gardens, FL, 33410  
https://www.unitedveterinarycare.com/

**Recruiting**  
Booth #111

United Veterinary Care is a national group of general, specialty and emergency veterinary practices united by our vision of improving the lives of all pets and people.

Our team is made up of some of the best clinicians and businesspeople in the veterinary profession. United Veterinary Care is a place where people come to practice what they're passionate about -- and change the world while they do.

---

**Universal Imaging, Inc.**  
299 Adams Street  
Bedford Hills, NY, 10507  
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CT Hepatic Attenuation in Dogs with Diabetes Mellitus to Evaluate for Suspected Hepatic Steatosis

Presenting Author: Christy Buckley, DVM - Purdue University College of Veterinary Medicine
Co-Author: Caroline Fulkerson, DVM, MS, DACVR - Purdue University College of Veterinary Medicine
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Hypoattenuation of the liver consistent with severe hepatic steatosis has been rarely reported in veterinary patients. In humans measuring CT hepatic attenuation is diagnostic for hepatic steatosis, and hypoattenuation of the liver is defined as absolute if less than 40 HU or relative if the liver is 10 HU less than the spleen. At the authors’ institution, some dogs presenting for diabetic ketoacidosis (DKA) have visually hypoattenuating livers. The purpose of this study is to describe hepatic attenuation in dogs with various stages of diabetes mellitus. We hypothesized dogs with diabetic ketosis (DK) or DKA were more likely to have hypoattenuating livers. Twenty seven diabetic dogs were included, fifteen categorized in group 1 as without DK or DKA, six in group 2 as DK without evidence of acidosis, and six in group 3 as DKA. In group 3, four of six dogs had absolute and relative hypoattenuating livers. Three of these were visually hypoattenuating to vasculature, with one having negative attenuation and a histopathologic diagnosis of severe hepatic lipidosis. In group 2, four of six dogs had relative hypoattenuating livers. In group 1, only one of fifteen dogs had a relative hypoattenuating liver. Hepatic steatosis is likely able to be diagnosed on CT in dogs and was more common with DK or DKA in our patients. These findings may help provide hepatic sampling recommendations and alter patient prognosis. Further research is needed to establish absolute and relative liver hypoattenuation in dogs with correlation to histopathology and patient outcome.
**Splenic Thickness Ratio in CT as a Predictor of Splenic Malignancy in Dogs with Generalized Splenopathy**

*Presenting Author: Aitor Gallastegui, LV, MSc, DACVR - University of Florida*
*Co-Author: Steven Robillard, DVM - University of Florida*
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*Co-Author: James Colee, M.S. - University of Florida*
*Co-Author: Christopher J. Lanier, DVM, MPH, MS - University of Florida*
*Co-Author: Diego Portela, MV, PhD, DACVAA - University of Florida*

The assessment of the spleen in CT can lead to inaccurate diagnoses, tissue oversampling, increased patient risk, and medical costs. However, current quantitative tools that can improve diagnostic accuracy and differentiate neoplastic and non-neoplastic splenic pathology are lacking. This study evaluated twelve splenic ratio measures for the diagnosis of splenic neoplastic pathologies resulting in generalized splenic changes in dogs. 260 dogs with a concurrent abdominal CT and splenic cytology were recruited retrospectively. Thirty-one dogs had splenic neoplasia with lymphoma being the most frequent (55%). Interobserver and intraobserver agreement for the subjective assessment of splenic mass effect and rounded margins was poor for both observers. Both observers had moderate interobserver agreement and substantial intraobserver agreement for the subjective assessment of splenomegaly. Three ratios were able to differentiate between neoplastic and non-neoplastic spleens with a cut of value of ≥2.1, with the following sensitivity, specificity, positive predictive value, and negative predictive values for observer one. PRTAO: 77%, 3%, 10%, and 40% (AUC= 0.628; p=0.015); POHAO: 74%, 5%, 10%, 58% (AUC=0.623; p=0.008); and PRHAO: 71%, 21%, 10%, and 86% (AUC, 0.617; p=0.028). However, the low predictive values, poor intraobserver agreement of less experienced observers, and poor interobserver agreement may limit the clinical value of this tests. Future studies with larger sample sizes, histopathology, or multivariate analyses might be necessary to identify a clinically valuable splenic thickness ratio. Cytology should still be performed in spleens with diffuse CT abnormalities to determine the presence of neoplasia.
AWARD WINNER
Assessment of Pulmonary Parenchymal and Vascular Enhancement with Thoracic Computed Tomography Angiography in Healthy Cats

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The pulmonary vasculature comprises large, medium and small caliber arteries and veins. Small pulmonary vessels (< 20-25 µm), expected to enhance in the presence of iodinated contrast medium, may contribute to lung parenchymal enhancement on computed tomography angiography (CTA). The objectives were to assess pulmonary parenchymal and pulmonary vascular enhancement and size in anesthetized healthy cats on CTA. Phase 1 compared automated versus manual contrast medium injection in three cats. Phase 2 compared three maintenance anesthetic protocols (1: alfaxalone; 2: isoflurane; 3: alfaxalone-dexmedetomidine) in four cats. Linear mixed and generalized models with post hoc correction were used. No significant difference in global lung attenuation was present between the two injection methods (F-value 0.23; IC -0.43–0.28). Automated injection resulted in simultaneous maximal pulmonary parenchymal and vascular (arterial and venous) enhancement immediately after contrast medium injection (T0). No significant differences in lung attenuation or in the size and attenuation of the pulmonary arteries and veins were found between the three anesthetic protocols (P>0.25). Pulmonary parenchymal enhancement was maximal at T0 for all anesthetic protocols. As with alfaxalone, the dorsoventral lung attenuation gradient was maintained with isoflurane, but not with alfaxalone-dexmedetomidine. A caudocranial gradient was also present for all anesthetic protocols. In parallel to lung enhancement, pulmonary arteries and veins showed maximal enhancement and size at T0 for all anesthetic protocols, which were significantly different from measures made at any other times (P< 0.001 to P=0.02). In conclusion, this study provides a basis for assessing lung parenchymal enhancement in healthy cats undergoing CTA.
Ocular Biometry in Rabbits Using Computed Tomography

Presenting Author: Nicholas Goody, BVM&S, MRCVS - The University of Edinburgh
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To establish a reliable method of measuring intraocular structures, and to establish a normal reference range for measuring eyes in domestic rabbits (Oryctolagus cuniculus) without findings of ophthalmic disease using a 64-slice multidetector computed tomography (MDCT) scanner. In this retrospective study, 100 eyes from 50 rabbits without findings of ophthalmic disease who received a head CT scan were selected for measurement of the eye’s horizontal, sagittal, and equatorial planes using 3D multiplanar reconstruction. Dimensions of the lens, anterior chamber and vitreous chambers, in addition to lens density in Hounsfield units were collected. These parameters were compared against age, sex, weight, body condition, and ear conformation. Comparison of measurements before and after intravenous contrast was performed. A reference guide was established, with width being the longest measurement (18.03 ± 0.81mm), followed by height (17.18 ± 0.69mm) and then length (16.64 ± 0.66mm). Age and weight were identified as being associated with significant differences in measurements, with age significantly associated with increased anteroposterior length of the anterior chamber, increased equatorial lens width, and increased lens density. Weight was significantly associated with an increase in eye length, width, height, and increased anteroposterior distance of the vitreous chamber. CT is a practical method of biometry of the rabbit eye, and these repeatable measurements correlate with sonographic measurements established by previous studies. Having these reference values is useful for veterinarians in the identification of ocular diseases in rabbits including lens luxation, microphthalmia, and buphthalmos.
Evaluation of Pneumorrhachis and Intraforaminal Gas Detected by Contrast-Enhanced Computed Tomography in Dogs Without Trauma

Presenting Author: Steven R. Magidenko, DVM - University of Florida
Co-Author: Elodie Huguet, DVM, DACVR - University of Florida
Co-Author: Federico R. Vilaplana Grosso, LV, DECVDI, DACVR - College of Veterinary Medicine, University of Florida

Pneumorrhachis (PR) is a rare condition in human and veterinary medicine, defined as gas within the spinal canal. Iatrogenic causes are the most common source of nontraumatic PR reported in humans. PR has been anecdotally recognized by the authors in dogs on CT. Our study aims to identify the cause, prevalence, and distribution of PR and intraforaminal gas in dogs undergoing CT, and identify any associated 24-hour post-CT complications. The medical records of dogs who underwent CT of the thorax, abdomen, and pelvis were retrospectively reviewed. Patients were excluded if they presented with a history of trauma, neurologic deficits, recent surgery, or epidural injection. PR and intraforaminal gas were identified as present or absent and quantified subjectively. Patient positioning, intravenous catheter location, and complications in the 24 hours following CT were recorded. PR was identified in 51/263 (19.4%) dogs. All dogs with PR had CT performed in sternal recumbency. Catheters were evenly distributed in laterality of placement, yet PR was predominantly right-sided (74%). The volume of gas identified was mild (87%) or moderate (13%). An increase in the amount of PR in post-contrast images was documented in 13 cases (14%). Intraforaminal gas was identified 19.8% of dogs and 73% had right-sided intraforaminal gas. No dogs developed neurologic deficits in the 24-hour post-CT. The incidence of PR and intraforaminal gas in this study was significantly higher than previously documented rates. Intravascular right-sided gas is proposed to be secondary to the ipsilateral location of the azygous vein and of no clinical significance.
A “Gullwing Sign” on Magnetic Resonance Imaging of Extradural Spinal Tumors Allows Prioritization of Round Cell Neoplasia

Presenting Author: Thomas Monto, DVM; University of Tennessee College of Veterinary Medicine
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Co-Author: Mylène Auger, DMV, DACVR; Animages
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A bilobed appearance of ventral extradural spinal lesions (“gullwing sign”) on magnetic resonance imaging (MRI) has been described with various spinal diseases in dogs including hydrated nucleus pulposus extrusion and spinal neoplasia and has been attributed to the meningovertebral ligament. The purpose of this retrospective, single-center study was to determine if the “gullwing sign” is more common with certain spinal tumor categories compared to others. The MRI database was searched for dogs and cats with a cytologic or histologic diagnosis of extradural spinal neoplasia. Cases were subdivided into 4 tumor classes (round cell, mesenchymal, epithelial, and neuroendocrine neoplasia). MRI studies were reviewed for the presence of a “gullwing sign”. Chi-Square and binary logistic regression analysis were performed to determine any association between the “gullwing sign” and tumor class and to determine if identification of a “gullwing sign” would allow prediction of a specific tumor class. Sixty-six cases were included in the study (5 epithelial, 31 mesenchymal, 4 neuroendocrine, and 26 round cell tumors). A “gullwing sign” was identified in 12/66 patients (18.2%) and was significantly more common in patients with round cell neoplasia (11/26 round cell tumors, 42.3%; 1/31 mesenchymal tumors, 3.2%; p< 0.001). A “gullwing sign” was almost twenty-nine times more likely to be associated with round cell neoplasia compared to other tumor classes (OR=28.6, 95%CI [3.4, 241.1]). Based on the results from this study, round cell neoplasia should be given primary consideration when a “gullwing sign” from extradural neoplasia is identified on MRI studies in small animal patients.
Primary hypoplasia of portal vein (PHPV) is a disorder characterized histopathologically by underdeveloped microscopic portal veins with no evidence of other disease cause portal hypoperfusion. The reported liver size in canine PHPV is controversial. Manual computed tomography (CT) hepatic volumetry is a noninvasive method to accurately calculate liver volume in dogs. However, there is no reported liver volume in dogs with PHPV using CT hepatic volumetry. Therefore, the purpose of this study is to describe liver volume in dogs with confirmed PHPV. The medical records was retrospectively searched to identify dogs that underwent abdominal CT and were diagnosed with PHPV. Breed, age, sex, body weight, and histopathological findings were also recorded. Manual CT hepatic volumetry was performed using a previously described method. The association between normalized CT-derived liver volume and age or body weight was calculated. CT hepatic volumetry was performed in 26 dogs with PHPV. The most common breed was Toy Poodle. The mean age of the dogs was 3.7 years and the mean body weight was 3.9 kg. The mean normalized liver volume was 26.5 cm3/kg. There were no significant correlations between CT-derived normalized liver volume and age and body weight. Our results suggest that the mean normalized liver volume in dogs with PHPV is similar to reported liver volumes in dogs without liver disease. While further research with larger sample sizes and control groups is needed to confirm these findings, our results suggest the potential for normal liver volume in dogs with PHPV.
Computed Tomographic Features of Presumed Normal Hepatic Lymph Nodes in 87 Dogs

Presenting Author: Jorge J. Santana Mignucci, DVM - The Ohio State Veterinary Medical Center
Co-Author: Eric Green, DVM - The Ohio State University
Co-Author: Greg G. Habing, DVM, MS, PhD, DACVPM - The Ohio State University

The hepatic lymphocentrum is a group of lymph nodes located near the porta hepatis. This lymphocentrum usually consists of two nodes, circular to ovoid in shape, located on either side of the portal vein. Previous retrospective studies have described abdominal lymph nodes, including hepatic lymph nodes, on computed tomographic (CT) examinations in a small number of dogs. The purpose of this retrospective study was to describe the number, location, height, width, length, x-ray attenuation (Hounsfield units, HU) of presumed normal hepatic lymph nodes in dogs on abdominal CT scans, to determine if the size of the lymph nodes is correlated to body weight, and to determine a cutoff value for a ratio of lymph node height to aortic diameter that may indicate lymphadenomegaly. Abdominal CT scans of 87 dogs with presumed normal hepatic lymph nodes were included. No cytologic or histopathologic evaluation was performed in any patient. In our presumed normal population, 95% of the patients had a lymph node height to aortic diameter ratio of less than 0.9.
Diffuse Tensor Imaging of the Plantar Nerves in the Horse

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Proximal suspensory desmopathy is a common cause of equine lameness, often associated with a compartment-like syndrome of the plantar fascia and accompanying neuropathy. The objective of this study was to optimize an MRI-based diffusion tensor imaging (DTI) protocol for imaging the plantar nerves at the level of the tarsus in normal equine limbs.

Ten pelvic limbs from horses euthanized for unrelated purposes and without evidence of PSD were imaged with a 3T MR system using both standard PDw DIXON and DTI sequences. A range of b-values from 600-1000 s/mm² was used. Data was processed with DTI Studios (https://dsi-studio.labsolver.org/). Relevant measurements were made for the medial and lateral plantar nerve along the plantar tarsus. The length and number of fiber tracts and DTI variables were recorded.

On PDw DIXON images, the mean cross-sectional area of the lateral plantar nerve at the level of the PIT and TMT was 6.55±0.37 and 4.71±0.73 mm² and the mean signal intensity was 810±162 and 776±173. DTI maps consistently generated tracts in the region of the lateral plantar nerve with DTI values in the range of values reported for peripheral nerves in humans. Our findings suggest that DTI of the medial and lateral plantar nerves at the level of the tarsus is possible, with quantitative DTI values providing objective parameters for evaluation of neural structures. These may be used as a basis for future comparison to neuropathies that may occur secondary to pathology such as PSD.
Computed Tomographic Features of Double Aortic Arch in Six Dogs

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Double aortic arch (DAA) is a rare, congenital anomaly affecting small animals, resulting in a complete vascular ring encircling the esophagus and trachea, and subsequent compression of these organs. Few studies have reported utilizing computed tomography angiography (CTA) for diagnosing DAA in dogs; thus, the imaging features are currently lacking in the literature. The objectives of this retrospective, multicenter, descriptive case series were to report the clinical and CTA characteristics of DAA in surgically treated cases. Medical records and CTA images were reviewed. Six juvenile dogs met the inclusion criteria (median age: 4.2 months; range: 2-5 months). The most common clinical signs included chronic regurgitation (100%), decreased body condition (67%) and coughing (50%). Common CTA features of DAA included a dominant left aortic arch (median diameter: 8.1 mm) and minor right aortic arch (median diameter: 4.3 mm) (83%), an aberrant right subclavian artery arising directly from the right aortic arch (83%), segmental esophageal constriction (100%) and variable degrees of dilation cranial to the heart base, and marked tracheal luminal compression (median %change: -55%) (100%) and leftward curvature of the trachea at the level of the bifurcation of the aortic arches (100%). All dogs underwent successful surgical correction with only minor postoperative complications. Due to the similarity of clinical and imaging characteristics described to that of other forms of vascular ring anomalies, CTA is vital for the specific diagnosis of DAA in dogs.
Aortic body paragangliomas (ABPGLs) are the most common heart base tumor in dogs, however descriptions of their CT and MRI findings are lacking. Although generally considered benign, ABPGLs can present as malignant neoplasms with local vascular or soft tissue invasion and metastasis. The objectives of this study were to characterize imaging features of confirmed benign and malignant ABPGLs and localize mass distribution with respect to established aortic body locations in dogs. Thirty-six dogs with 35 CTs and 3 MRIs were included. Most dogs were males, with nearly equal representation of brachycephalic and non-brachycephalic dogs. ABPGLs were heterogeneously contrast-enhancing (35/35), well-marginated (36/36), predominantly lobular (19/36) or ovoid (12/36), and cavitated (18/36). Vascular and local invasion was noted in 7/36 cases and confirmed metastatic lesions in 8/36 cases. Sites of metastasis included the local lymph nodes, heart, vena cava, bone, lungs, spleen, and larynx. ABPGLs frequently caused displacement (31/36) and compression (26/36) of regional structures, and less often encircled regional vessels (7/36). Using ROC analysis, tumor length of >6.6 cm and pre-contrast attenuation of >49.9HU had a sensitivity of 86% (for both) and respective specificity of 79% and 67% for vascular invasion. MRI features included variably T1 and T2 hyperintense parenchyma with tubular and punctate flow voids attributed to intratumoral vessels. ABPGLs present as lobular or ovoid, heterogeneously contrast-enhancing, often cavitated, middle or combined cranial/middle mediastinal masses with variable regional mass effect and the potential for local invasion and metastasis.
Radiographic Findings in Dogs with 360 Degrees Gastric Dilatation and Volvulus

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Gastric dilatation and volvulus (GDV) is a life-threatening emergency that requires urgent intervention. 360-GDV has been rarely reported in veterinary medicine and to the authors knowledge studies describing the radiographic features of 360-GDV are lacking. The aim is to report agreement rates between radiologists and sensitivity and specificity of radiographs to diagnose 360-GDV. Radiographic features and clinical variables associated with 360-GDV are also reported. Confirmed 360-GDV cases were retrieved, and the radiographic findings were compared to dogs presenting with gastric dilatation (GD) and 180-GDV. Images were reviewed and graded by three blinded board-certified radiologists. A total of 16 dogs with confirmed 360-GDV were identified. The median age was 10 years old (2 -11 years). The sensitivity for detection of 360-GDV ranged between 43.7% and 50% and the specificity between 84.6% and 92.1%. Interobserver agreement on final diagnosis was substantial (Kappa = 0.623; 0.487 -0.760, 95% CI). The highest agreement rate was in cases of 180-GDV (87%) followed by the GD cases (72%) and 360-GDV (46%). Esophageal gas distension and lack of small intestinal dilation were the only radiographic features associated with 360-GDV. Similar pyloric position was found between GD and 360-GDV. Additional radiographic variables that could help differentiate GD from 360-GDV include degree of gastric distension and the peritoneal serosal contrast. Two cases with 360-GDV were misdiagnosed by the three radiologists as GD. In conclusion, radiographically 360-GDV cases can resemble GD and vice versa. Radiologists and clinicians should be aware of the low sensitivity of radiographs for detection of 360-GDV.
ABSTRACTS

AWARD WINNER
Computed Tomographic Characteristics of Anatomical Variations of External and Internal Jugular Veins in Dogs

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The external jugular vein (EJV) has been used extensively in veterinary medicine, while the internal jugular vein (IJV) has been used mainly for research. Limited literature regarding anatomical variants in both EJV and IJV is available mainly in the form of case reports. The objectives of this study were to identify the number of dogs showing variations of the jugular veins in dogs undergoing computed tomography (CT) of the head and neck and to characterize these variations. Out of 1000 dogs recruited, 193 dogs had anatomical variations. Six types of anatomical variations were identified. The most common Type I (72.0%, n=139) was the absence of the linguofacial vein, with the lingual, facial, and maxillary veins entering the EJV at a common branching point. Type II (14.0%, n=27) described variable course of the EJV and IJV, which might result in absence of EJV. Type III (4.2%, n=8) was a variable anastomotic loop formed by the linguofacial or maxillary vein at the junction of the EJV. In Type IV (3.6%, n=7), the EJV was either aplastic or hypoplastic just distal to its formation. Type V was found in only six dogs (3.1%) with unilateral differences in diameter of the IJV. Six out of 193 dogs had a combination of more than one variation (Type VI, 3.1%). All variations described were found either unilaterally (47.2%, n=91 on the right side; 29.5%, n=57 on the left side) or bilaterally (23.3%, n=45). Recognition of these variations might be crucial for clinical applications.
Extramural Compression and Dorsoventral Narrowing of the Left Principal Bronchus in Lateral Recumbency Related to Canine Body Conformation

Presenting Author: Andrew Leffler, DVM - The Ohio State University
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Tracheal and bronchial narrowing are identified in routine radiography and may implicate airway degeneration. Focal principal bronchial narrowing due to extramural compression has been described while in sternal recumbency (Cote et al.). Authors hypothesize: 1) radiographs overestimate airway size compared CT, 2) bronchi are smaller when in dependent positioning, 3) the LPB height to width (H:W) will be smaller than the right principal bronchus (RPB) H:W while in lateral recumbency, and 4) there is a positive correlation of LPB H:W and thoracic H:W.

Dogs received three view thoracic radiographs and two CTs (right lateral and left lateral positioning). All measurements were completed in right lateral recumbency for radiographs and CT. The principal bronchi, descending aorta, and thorax were measured on laterally positioned CTs as outlined by Cote et al. Non-parametric paired analyses compared modalities and positioning. Pearson correlations assessed continuous measurements of thoracic conformation H:W and the principal bronchi H:W.

20 dogs were included. DV diameter measurements of the principal bronchi did not differ between radiographs and CT. Lobar bronchi are significantly smaller when in the dependent position for multiple lobes. There is no significant difference in HU for the accessory lung lobe between right and left lateral positions. The LPB H:W ratio was significantly smaller than the RPB H:W ratio data. Dogs with lower thoracic H:W ratio positively correlates to DV flattening of the LPB while in lateral recumbency. DV narrowing of LPB can be an extramural compression rather than presumed to be solely bronchomalacia.
Veterinary Radiologist Use of Eye Protection Away from Work

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Ocular injuries away from work include those sustained at home, playing sports or due to sun damage. In the general population, approximately half of all eye injuries occur in the home. Approximately 30% of Americans wear protective eyewear when undertaking eye-risk activities at home. The study purpose was to determine the use of protective eyewear amongst veterinary radiologists away from work. An observational survey study of veterinary radiologists was conducted. Demographic data and use of protective eyewear during non-work activities was collected. Descriptive statistics were calculated. Percentages for each response grouping of ‘Always’, ‘Sometimes’ and ‘Never’ were determined. A chi-squared test of independence was performed to examine the relation between gender, age and years exclusive to imaging, and protective eyewear away from work. There was a total of 386 respondents. Fifty six percent never use eye protection when gardening, 74% for handling chemicals, 93% when cooking and 64% when playing sport. More people used eye protection than did not for DIY and driving. There was a significant relationship between eye protection during DIY and gender (P< 0.05). Males were more likely to wear eye protection. There was a significant relationship between eye management away from work and age for gardening, use of chemicals, cooking, sport and DIY (P< 0.05). Respondents over 51 years were more likely to wear eye protection. The finding that most radiologists did not wear eye protection for most activities raises concern for potential eye damage resulting in incorrect patient diagnoses or loss of radiologist income.
Blood and Hand Surface Lead in Veterinary Workers Using Lead Shielding During Diagnostic Radiography

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The objectives of this prospective, analytical, descriptive study were to compare lead blood concentrations in veterinary workers using lead shielding with concentrations in a control population, to measure hand surface lead before and after use of hand shielding, and to compare hand surface lead with and without the use of disposable gloves worn under hand shielding. Fifty-three blood and 102 hand wipe samples were analyzed for lead using inductively coupled plasma mass spectrometry. There was no difference in blood lead between the exposed and control workers. Before lead glove use the median hand surface lead was 2.7 μg (range, 0.3-41.5 μg), and after lead glove use the median hand surface lead was 13.8 μg (range, 0.3-2337.1). Hand surface lead was significantly higher after use of lead gloves than before use (P < 0.001). The median hand surface lead for workers who wore disposable gloves under the lead gloves was 5.4 μg (range, 0.3-44.3 μg), and the median hand surface lead for workers who did not wear disposable gloves was 869.7 μg (range, 8.8-2337.1 μg). Hand surface lead was significantly higher for workers who did not wear disposable gloves under the lead gloves (P < 0.001). After lead glove use, 69% (18/26) of hand surface lead samples from workers not using disposable gloves were greater than 500 μg, 42% (11/26) were greater than 1000 μg, and 12% (3/26) were greater than 2000 μg. If lead shielding use is unavoidable, disposable gloves should be worn, and skin should be decontaminated after use.
Radiographic Appearance of the Cecum in Dogs

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Although the canine cecum is commonly identified on abdominal radiographs, a detailed description of its appearance is rare. There is no literature with the specific focus of describing its position, size, shape, or contents, leading to different opinions of what is considered normal. Therefore, the aims of this study were to 1) report how frequently the cecum can be identified, 2) characterize the typical location, contents, size, and shape of the cecum, and 3) provide a preliminary comparison of these features between dogs with and without gastrointestinal signs. All abdominal radiographic studies acquired from September through November 2022 were retrospectively evaluated. The cecum was identified in at least one view in 110/185 studies (59%) which met inclusion criteria. When identified, the cecum always contained gas (100%), frequently contained feces-like content (37%), and rarely contained fluid (4%). The greatest diameter of the cecum ranged from 2.5cm - 15.4cm (mean 7.2cm in the VD view), and it was most often coiled in shape (68%). The cecum was usually located within the mid or dorsal abdomen in lateral projections and the mid or right abdomen in VD projections. It was most commonly at the level of the T13-L5 vertebrae, occasionally identified as far cranial as T11 or caudal as L7. Further statistical analysis remains to compare the ceca of dogs with gastrointestinal signs to those without. This study will help to unify our understanding of the appearance of the cecum, and may provide a basis of comparison for future investigations of cecal pathology.
AWARD WINNER
Comparison of Sedation and General Anesthesia Protocols for 18F-FDG-PET/CT Studies of Dogs and Cats: Musculature Uptake and Worker Radiation Dose

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In veterinary medicine, PET/CT scans are usually performed with the patient under general anesthesia to reduce motion, and to minimize contact with staff, possibly reducing radiation doses to workers. The main objective of this single-center, prospective, crossover study was to compare volume and maximum standardized uptake values (SUVmax) of 18F-FDG uptake in the skeletal musculature of sedated and anesthetized healthy dogs and cats. A secondary objective was to compare radiation doses to workers between sedation and general anesthesia. Sedation was associated with increased volume of 18F-FDG uptake in the musculature of the thoracic limbs (P = .01), cervical (P = .02), and thoracic (P = .03) spinal musculature. The uptake pattern in the appendicular skeletal musculature was bilaterally symmetric. Increased SUVmax was observed for the muscles of the cervical and thoracic segments (P = .01 for both) of the spine with sedation compared to general anesthesia. Radiation doses to workers were significantly higher with sedation compared to general anesthesia (P = .01). However, radiation doses per PET/CT scan to workers in sedated patients (1-3.75 μSv) were lower than reported in previous studies. Sedation for PET/CT studies in dogs and cats is feasible but associated with increased physiologic uptake in specific musculature, and with increased radiation doses to workers. These limitations can be overcome by recognition of the uptake pattern and monitoring/rotation of the involved staff at institutions where a high caseload is expected.
Ultrasonographic Appearance of The Spleen of Growing Kittens Using a High Frequency Linear Transducer

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A reticulonodular splenic pattern, characterized by the presence of numerous hypoechoic nodules, is commonly associated with neoplastic or infectious etiologies. However, this appearance has been described as a normal age-related variant in both human children and puppies up to one year of age, likely representing lymphoid follicles. The purpose of this study was to determine whether the ultrasonographic appearance of the spleens of healthy, growing kittens mimics the canine presentation.

This was a prospective, descriptive study design. Fifty-six spleens and 47 healthy kittens (9 repeat kittens) were included. Apparently healthy kittens between the age of 0-18 months were scanned using a high frequency linear transducer. A reticulonodular pattern was present in 50 spleens (89%), with grade 2 being most common and the grades being highest on average between 0-4 months of age. Unexpectedly, young cats at or slightly older than 1 year of age were often noted to have a reticulonodular pattern, persisting in many up to 1.5 years old. After 4 months of age, there was a negative correlation with age and the grade of the imaged spleen, with a slight positive correlation after 11 months of age. The overall negative association with grade and increasing age persisted even amongst the kittens that were enrolled serially.

The findings of this study suggest that a reticulonodular pattern in young cats and kittens may be a normal finding within this population.
Shear-Wave Elastography of The Canine Patellar Tendon in Healthy Dogs and the Influence of Stifle Joint Angle

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Elastography is a sonographic modality that measures tissue stiffness, a mechanical property of tissues and a biomarker for disease. Canine musculoskeletal application has been limited to qualitative strain elastography of the patellar tendon and few other structures. This prospective study aimed to quantitatively evaluate patellar tendon stiffness using shear-wave elastography (SWE) in 17 clinically normal adult dogs weighing 25 kg or greater under sedation. Tendon stiffness was assessed at different stifle angles and in three different locations to assess if angle and location affected stiffness. Dogs were screened by general and orthopedic exam, lateral stifle radiographs, and patellar tendon 2D ultrasound. SWE was performed in long-axis at 150°, 120°, 90°, and 60° stifle angles at the proximal, middle, and distal tendon segments. Quality diagnostic SWE results varied significantly with stifle angle, and 150° of extension was the only angle found to be clinically useful based on ease of obtaining measurable results and having a quality control propagation waveform. Patellar tendons were primarily stiff with a red color elastogram and had a mean SWE velocity of 7.32 m/s ± 0.90 m/s. Tendon stiffness did not differ along tendon length at 150° or 120°. Tendon stiffness trended lower in the distal segment at all angles with greater standard deviation, raising questions regarding its clinical value. Stiffness decreased in the middle segment of tendon at 150° compared to 120° and indicates mild variability related to stifle angle. This study establishes a quantitative baseline of normal patellar stiffness to compare with pathologic states.
AWARD WINNER
Ultrasound-Guided Small Intestine Mucosal Aspirates Aid in The Diagnosis of Feline Lymphoma Using PCR for Antigen Receptor Rearrangement: 60 Cases

Presenting Author: Cristina M. Geston, Bsc, DVM - Inland Empire Veterinary Imaging
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We propose a technique of ultrasound guided aspiration of the small intestine in cats with ultrasonographic findings suggestive of reactive or neoplastic enteropathy which has successfully yielded samples on which PCR for Antigen Receptor Rearrangement (PARR) testing was performed. Segments of small intestine with increased overall thickness >0.26 cm, subjective muscularis thickening, or hyperechoic mucosa were sampled using a 27 g needle. Aspiration of the entire mucosal thickness was performed. Samples were reviewed cytologically by a board-certified cytopathologist familiar with small intestinal cytology. Samples were deemed sufficient for PARR based on an estimated cell count of >50,000. Samples were submitted to Colorado State University for PARR testing and successful results of clonality or poly-clonality were obtained. Discussion with referring veterinarians of all patients for whom PARR was performed on intestinal samples revealed no known complications. This technique allows for sampling of multiple segments of small intestine and sampling of the most abnormal areas on ultrasound. It is relatively low cost in comparison to endoscopy and surgical biopsy with histopathology and is more readily available than endoscopy. Ultrasound-guided small intestinal aspiration including the entire mucosal thickness is a safe, effective, accessible, and economic procedure which can provide representative samples of various segments of the gastrointestinal tract for use with PARR and cytology to aid in the diagnosis of feline gastrointestinal small-cell lymphoma. Although not intended as a stand-alone test, PARR testing on small intestinal aspirates can help guide treatment decisions in cases where access to multiple advanced diagnostics is limited.
Prevalence and Association of Pancreatitis in Dogs with Hypercalcemia

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A possible association between pancreatitis and hypercalcemia has been widely debated in human medicine. Objectives of this single-center, retrospective, observational study were threefold: to estimate the prevalence of pancreatitis in dogs with hypercalcemia, to determine if a specific etiology/etiologies have a higher prevalence of pancreatitis, and to determine if higher levels of serum calcium was more likely to be associated with pancreatitis. Medical records (January 2005 – December 2021) were searched to identify dogs with hypercalcemia that met the inclusion criteria of 1) abdominal ultrasound and 2) ionized calcium and serum calcium levels obtained within 1 week of imaging (n = 180). The included dogs were categorized by the etiology causing hypercalcemia (primary hyperparathyroidism, malignancy, renal hyperparathyroidism, hypoadrenocorticism, and granulomatous disease). Ultrasound images were reviewed for evidence of pancreatitis by a board-certified veterinary radiologist and a veterinary diagnostic imaging resident. The overall prevalence of pancreatitis in dogs with hypercalcemia was 18/180 dogs (10%). Prevalence of pancreatitis in each category is as follows: primary hyperparathyroidism, 10/63 (15.87%), hypercalcemia of malignancy, 6/106 (5.66%), renal hyperparathyroidism, 1/6 (16.67%), hypoadrenocorticism, 1/3 (33.33%), and granulomatous disease, 0/2 (0%). Based on logistic regression analysis, dogs with primary hyperparathyroidism were more likely to have pancreatitis than dogs with hypercalcemia of malignancy (p < 0.033). Hypercalcemic dogs with pancreatitis had significantly lower ionized calcium (p < 0.0042) and serum calcium (p < 0.0056) than hypercalcemic dogs without pancreatitis. Pancreatitis may be associated with lower calcium levels in hypercalcemic dogs; however, further studies are needed to elucidate these findings.
The Abdominal Ultrasonographic Findings of Cats with Feline Infectious Peritonitis: An Update

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The aim of this study was to describe the abdominal ultrasonographic findings in cats with feline infectious peritonitis (FIP). A retrospective study of cats was performed in a single academic veterinary hospital. FIP diagnosis was reached on review of history, signalment, clinical presentation, laboratory findings (complete blood count and chemistry panel), peritoneal fluid analysis, cytology and/or histopathology results from abnormal organs, and/or molecular testing (immunohistochemical or FCoV RT-PCR). Cats with confirmed FIP by molecular testing and cats with a highly suspicious diagnosis of FIP were included. Twenty-five cats were included. Abdominal ultrasound findings included abdominal effusion in 22/25 cats and lymphadenopathy in 20/25. Intestinal changes were noted in 17/25 cats. Six out of 17 cats showed colonic changes with asymmetric wall thickening in 2/6. Ileocecocolic junction lesions noted in 6/17 cats had a mixed echogenicity mass. Jejunal abnormalities noted in 4/17 cats, included segmental wall thickening (3/4), and loss of wall layering (1/4). Hepatic abnormalities were found in 20/25 cats. Hepatomegaly was present in 13/25 cats and in 12/13 the liver was hypoechoic. Splenic changes were present in 9/25 cats; 7/9 had splenomegaly, 3/9 spotted parenchyma and 1/9 hypoechoic nodules. Renal changes were present in 8/25, including a hypoechoic subcapsular rim in 5/8, and cortical nodules in 7/8. Most cats (23/25) had two or more locations of abdominal abnormalities. A wider range of ultrasonographic lesions compared to previous reports is reported in cats with FIP. Effusion, lymph node, liver and intestinal tract changes were the most common findings.
Ultrasonographic Evaluation of Splenic Nodules and Masses with B-Flow Interrogation Correlates to Cytologic or Histopathologic Characterization as Benign or Malignant

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Ultrasound is widely used to screen patients for splenic disease. The use of B-Mode, color Doppler, and power Doppler can better evaluate splenic lesions as some imaging characteristics have been associated with malignancy. A relatively new non-Doppler technology used to evaluate vasculature called B-Flow, helps overcome certain limitations of color and power Doppler that affect visualization of blood flow. Currently there are no studies describing the use of B-Flow in evaluating splenic lesions in dogs. The purpose of this study was to evaluate the usefulness of B-Flow imaging to differentiate benign and malignant splenic nodules and masses both alone and combined with traditional B-mode and Doppler techniques. A total of 55 splenic lesions were evaluated including 45/55 (81.8%) benign and 10/55 (18.18%) malignant lesions. On B-mode evaluation, imaging characteristic such as capsular distortion, a targetoid appearance, lesion echogenicity and echotexture, and the presence of cavitary effusion were not association with malignancy (P-value: 0.123, 0.591, 0.974, and 0.158, respectively). The presence of a tortuous intralesional vessel (OR = 2.60, P = 0.018) or an increased intralesional:extralesional vessel diameter ratio (OR = 5.20 for each 1.0 unit increase in ratio, P = 0.025) as assessed with B-flow was associated with malignancy. No other vascular characteristics evaluated with B-flow, color Doppler, or power Doppler were associated with lesion malignancy (P values ranging between (0.056 – 0.839). In conclusion, the use of B-flow to evaluate splenic lesions for tortuous or larger intralesional vessels may help clinicians prioritize malignant etiologies over benign ones.
Metastases of feline primary pulmonary carcinoma are common and associated with a poor prognosis. Although pleural metastases are histologically common, its ultrasonographic characteristics have not been described. Fine needle aspiration (FNA) of the pleura has the potential to be a diagnostic option for diagnosing thoracic disease. The aim of this retrospective study was to evaluate the ultrasonographic features of pleural metastases in cats with pulmonary carcinoma and the diagnostic potential of ultrasound-guided FNA for pleural metastases.

Cats with pleural effusion, who had undergone pleural ultrasound, and had a confirmed diagnosis of pulmonary carcinoma or metastatic carcinoma with radiographic diagnosis of primary pulmonary neoplasia were included in the study. Three observers reviewed the ultrasound images and evaluated the size, maximal thickness, location, shape, echogenicity, homogeneity, and intercostal muscle invasion of the pleural thickening. Cytological and histopathological diagnoses were also recorded.

Twenty-two cats were included. Ultrasonographic pleural thickening was present in all 22 cats, with 18 in the cranial pleura. The pleural thickening was commonly diffuse (54.5%), smooth (40.9%), hypoechoic (68.2%), and homogeneous (68.2%). The mean maximal thickness of the pleura was 5.6 mm. Intercostal muscle invasion was suspected in eight cats. In all six cases where FNA of the thickened pleura was performed, a cytological diagnosis of malignant neoplasia was confirmed from the thickened pleura.

This study is the first to provide an ultrasonographic appearance of pleural metastases in cats with pulmonary carcinoma. Additionally, the study describes the diagnostic potential of ultrasound-guided FNA in thickened pleura in feline pulmonary carcinoma.
Assessment of an Ultrasound Skill Simulator in Teaching Basic Ultrasound Use

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Ultrasonography is a challenging skill to teach given the long learning curve and requirement for hands on practice coupled with saturated veterinary academic programs and the shortage of academic veterinary radiologists. Ultrasound skill simulators can help bridge the gap by providing students access to individual, reusable simulators for skill acquisition and practice. A reusable and accessible 3D shapes ultrasound skill simulator was created to teach basic ultrasound skills. Fifty second year veterinary students watched an instructional video and performed a basic ultrasound skill test on a simulator which was followed by a period of practice before repeating the test. Students improved their time to task completion on the second test by an average of 58 seconds. Improvements were also noted in the number of shapes they interrogated (23%, 3.67 to 4.51) and the average number of correctly identified shapes (42%, 2.18 to 3.1). Feedback on a post-session survey was largely positive, with 86% (43/50) students strongly agreeing that they would use the simulator again for practice and that it should be incorporated into the curriculum, 62% (31/50) strongly agreeing with the simulator increasing their basic ultrasound skills and knowledge, and 44% (22/50) strongly agreed that the simulator improved their confidence using ultrasound.
Urothelial carcinoma (UC) is a highly malignant urinary cancer of the transitional epithelium in dogs. Recent advances in artificial intelligence (AI) and machine learning have shown substantial potential in veterinary medicine. The purpose of this study was to evaluate the accuracy of AI-based software in detecting UC in dogs using abdominal radiography and to identify factors that influence the sensitivity of AI-based diagnosis.

Dogs underwent abdominal radiography and ultrasound were retrospectively retrieved. Dogs with histologically confirmed UC and ultrasound changes were included in UC-training and UC-validation groups, while dogs without clinical suspicion of urinary neoplasia and without ultrasound findings consistent with UC were included as non-UC-training and non-UC-validation groups. Histological and imaging findings of UC were recorded.

A convolutional neural network (CNN) was trained with 500 studies from the UC-training and 500 studies from the non-UC-training groups. For validation, an additional 185 studies from the UC-validation and 180 studies from the non-UC-validation groups were used to provide AI-based diagnosis of UC by the trained CNN.

The sensitivity, specificity and accuracy of the AI-based diagnosis of UC were 69%, 67% and 68%, respectively. The software showed higher sensitivity in detecting more severe UC (histological grade 4/4, diffuse and with muscular invasion) with mineralization. However, sublumbar lymphadenomegaly and ureteral obstruction did not improve the sensitivity of AI-based UC diagnosis.

In conclusion, well-trained AI software can potentially diagnose severe UC with mineralization using abdominal radiography. Further research is needed to improve the accuracy and clinical applicability of AI-based diagnosis of UC in dogs.
Comparison of Radiological Interpretation Made by Veterinary Radiologists and AI Software for Canine and Feline Radiographic Studies

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Human-based radiologic interpretation suffers from both noise and bias. Artificial Intelligence (AI) has the potential to reduce bias and increase diagnostic availability. Purpose of this study was to analyze how commercial AI software dedicated to veterinary radiology compares to the performance of veterinary radiologists. Our hypotheses were that the mean diagnostic accuracy of AI will be higher than the mean diagnostic accuracy of veterinary radiologists and that the diagnostic accuracy of AI is higher than the diagnostic accuracy of any radiologist. Fifty canine and feline radiographic studies in DICOM format were anonymized and reported by 11 board-certified veterinary radiologists and processed with commercial AI software dedicated to small animal radiography (SignalRAY®️, SignalPET®️ Dallas, TX, USA). The diagnostic were recorded and coded. The mean sensitivities, specificities and accuracies were high for both veterinary radiologists (0.5787; 0.9650; 0.8733) and the AI software (0.7008; 0.9402; 0.9204). The AI software outperformed the below-mean veterinary radiologists (p< 0.0002), confirming our first hypothesis. There was no significant difference in diagnostic accuracy between the AI software and the best-performing veterinary radiologist (p=0.0051), rejecting our second hypothesis. AI performed better in low-noise settings and exhibited different strengths in low-noise settings and high-noise settings. Given the unique strengths of human experts and AI, as well as the differences in sensitivity versus specificity and low-noise versus high-noise settings, AI is likely to best complement rather than substitute human experts. Hence, it would be worth exploring how AI could be provided to human experts to enhance their performance.
Use of Radiation Therapy (2 Gy X 4) to Treat Feline Chronic Enteropathies

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Introduction: Chronic enteropathies in cats are treated with oral medications, but some cats resist pilling. We hypothesize that external beam RT could provide an appealing alternative.

Methods: Cats with biopsy-confirmed lymphoma/inflammatory bowel disease complex (FLL/IBD) were enrolled into a single-arm prospective clinical trial. Computerized (IMRT or 3D CRT) RT plans were created; a 1 cm isotropic PTV expansion from the intestinal tract was utilized and 95% of the PTV received 8 Gy total (2 Gy x 4 every-other-day fractions). Therapeutic responses were evaluated using veterinary exams and monthly owner-completed questionnaires, and categorized as: no response (NR), partial response (PR), or complete response (CR).

Results: Nine cats were enrolled; 5 had enteropathy-associated T cell lymphoma and 4 had inflammatory bowel disease (lymphoplasmacytic and/or eosinophilic enteritis). One owner withdrew their cat from the study after fraction #2. The remaining 8 cats completed RT; 5 developed transient lethargy, hyporexia and/or diarrhea after RT; in all cases, these signs were managed on an outpatient basis and resolved within 2 weeks. In total, 6 cats responded favorably to RT (CR in 5 cats, PR in 1); only two had NR. Three cats have >1 year of follow-up on-study, and none of them have relapsed.

Discussion: This succinct RT protocol resulted in minimal toxicity, and clinical improvement in most cats. Continued assessment for response duration is ongoing.

Conclusion: Early experiences indicate that low-dose abdominal cavity RT (2 Gy x 4) is a safe and effective option for cats with FLL/IBD.
SQAP Inhibits DNA Repair and Sensitizes Canine Cancer Cells to Radiation in Normal Oxia and Hypoxic Condition

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Sulfoglycolipid, α-sulfoquinovosyl-acylpropanediol (SQAP) is a novel radiosensitizer, which is known to cause angiogenesis alteration and sensitizes hypoxic tumors in the in vivo animal model. We examined the SQAP radiosensitization mechanisms from DNA repair with canine cancer cell lines and CHO isogenic DNA repair cell lines. Previous studies have shown that SQAP radiosensitization was limited to in vivo xenograft models, but we found SQAP sensitized cells to radiation in a tissue culture system. SQAP sensitized three canine osteosarcoma cell lines and three canine melanoma cell lines to gamma-ray irradiation. Sensitizer enhancement ratio (SER) calculated from D10 values were 1.19-1.41. SQAP was also effective in radiosensitizing cells under hypoxic conditions with SER values of 1.17-1.76. The oxygen enhancement ratio (OER) was calculated from D10 values, and SQAP treatment did not change OER values under normal oxic and hypoxic conditions. SQAP treatment was not selectively effective towards hypoxic cells but rather sensitized cells in any oxygen status. To further identify potential mechanisms of radiosensitization we utilized CHO cells with DNA repair deficient mutants. SQAP treatment reduced the spontaneous sister chromatid exchange formation in CHO wild type and EM9 (XRCC1 mutant). On the other hand, 51D1 (rad51d mutant, homologous recombination (HR) repair deficient) showed no reduction. CHO wild type cells were radiosensitized by SQAP but 51D1 with homologous recombination repair deficiency were not radiosensitized by SQAP treatment. We identified that SQAP treatment enhanced mitomycin C cytotoxicity in CHO cells. SQAP may be a novel DNA repair inhibitory activity and a promising radiosensitizer.
Effects of Half Body Irradiation on Remission and Survival for Dogs with High Grade Lymphoma

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An optimum protocol of adding wide-field irradiation to multi-agent chemotherapy for dogs with lymphoma has not been established. The aim of this study is to evaluate the efficacy of a combination chemotherapy and half body irradiation (HBI) protocol for dogs with high-grade lymphoma. The cranial HBI was administered 2 weeks after completion of the second cycle of the multi-agent chemotherapy protocol. The radiation therapy protocol consisted of 4 Gy/fraction once per day for 2 consecutive days for cranial half body, followed by the same protocol to the caudal half 2 weeks later. In the control group, only multi-agent chemotherapy was administered. All patients were required to have cytological confirmation of high-grade lymphoma (at least stage III) and have complete remission after two cycles of multi-agent chemotherapy. Fourteen patients in HBI and 11 patients in the control group were included. The median progression free interval (PFI) in the HBI group (558 days) is significantly longer than in control group (316 days, P = 0.0023). Ten of 14 patients in HBI group are still alive with a median follow-up time of 571 days. The mean ST in HBI group (906 days) is not significantly longer than chemotherapy only (316 days). The only prognostic factor for PFI is whether the patient had radiotherapy or not (P = 0.03). T or B cell lymphoma and substage were not correlated to PFI. For chemotherapy-responding patients that complete a multi-agent protocol, HBI significantly prolonged the time to tumor relapse compared with chemotherapy-only group.
Local Immune Response to Radiation Therapy and Combined Myeloid Cell Targeted Therapy in a Dog Model of Sinonasal Carcinoma

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Introduction: Sinonasal carcinoma (SC) is an aggressive cancer. Myeloid cells like macrophages (MQs) and monocytes can exhibit immunosuppression in the tumor immune microenvironment (TiME). The repurposed drugs propranolol and losartan may reprogram TiME by decreasing MQ and monocyte recruitment and immunosuppressive activities. We hypothesize that combining Stereotactic Body Radiation Therapy (SBRT) and TiME-modulation (propranolol + losartan) will inhibit myeloid cells, restore T-cell immunity, and provide more durable local control for canine SC patients.

Methods: Dogs with spontaneous SC were randomized into SBRT and SBRT + propranolol & losartan (SBRT-PL). Local immune responses were assessed via serial nasal lavage, in which cytokines were quantified by Milliplex analysis, and cells were analyzed by flow cytometry and NanoString Immune-Oncology panel. Statistical analyses were performed using Prism software.

Results: 11 dogs have been enrolled (8 SBRT, 3 SBRT-PL). At 3-month, compared to SBRT, SBRT-PL had decreased pro-tumor cytokines including IL-6 (16% vs 1324%), IL-8 (12% vs 366%), KC-like (28% vs 115%), and MCP-1 (204% vs 622%). Additionally, SBRT-PL had higher cytotoxic T (2933% vs 374%), helper T (1114% vs 202%), co-stimulatory cells (159% vs 46%), and less T-regs (80% vs 298%) and M2 MQ (146% vs 422%). Preliminary NanoString data showed decrease hypoxia and TNF-α signaling in SBRT-PL at Day 14 compared to pre-treatment.

Conclusion: Concurrent SBRT and propranolol/losartan may suppress pro-tumor cytokines and immunosuppressive myeloid cells and encourage T-cell infiltration. We will continue evaluating transcriptomics of serially collected samples by NanoString analysis. Tumor response and survival will be correlated with the molecular findings.
Lattice SBRT for Palliation of Large Soft Tissue Sarcomas in Dogs

Unresectable soft tissue sarcomas (STS) tumors in dogs are challenging to treat with palliative radiation therapy resulting in response rates of 7-50% and progression free survival from 5-8 months. Stereotactic body radiation therapy (SBRT) improves local control and palliation of symptoms of unresectable tumors in human patients, however, SBRT can be difficult to deliver safely, particularly in superficial tumors. Spatially fractionated radiotherapy using an intensity-modulated technique termed “Lattice radiotherapy” allows for safe hypo-fractionated, dose escalated therapy for large tumors and may contribute to immunostimulation. We hypothesize that patients receiving lattice SBRT will experience longer control of their local disease with minimal side effects compared to current palliative protocols, and that lattice will result in an immunologically “hot” tumor. Seven dogs were prospectively randomized to receive either standard of care (SOC) palliative RT (n=3, 20 Gy in 5 daily fractions) or lattice SBRT (n=4, 20 Gy to 95% of the PTV with lattice-SIB to 66.7 Gy delivered every other day). Progression Free Survival was longer in dogs treated with lattice with no dogs progressing with lattice SBRT at median 230 days versus all dogs progressing in the control arm at a median 21 days (p=0.027). No dog in either group developed acute radiation side effects. Evaluation of immunologic changes to the tumor and peripheral blood mononuclear cells is currently underway using the NanoString Canine IO panel. Lattice SBRT was well-tolerated and resulted in a measurable disease response and palliation and could be considered in patients with large, unresectable soft tissue sarcoma.
Radiotherapy (RT) is used for treatment of canine infiltrative lipoma. Response data is limited to a single study of 13 dogs published 20 years ago. Inclusion criteria for this retrospective multi-institutional study were dogs diagnosed with infiltrative lipoma, treated with IMRT or 3D-CRT, and with minimum 2 years follow-up. Progression free survival (PFS) was estimated from the first day of RT to disease progression or death. Dogs alive at last contact were censored. Kaplan/Meyer analyses, Mann-Whitney U Test and Cox proportional-hazards regression were performed. Twenty-seven dogs met inclusion criteria. Twenty-one tumors were macroscopic, six were microscopic. Median gross tumor volume (GTV) was 154.2 cm³ (range: 1.8-2524 cm³). Median total dose given in daily fractions was 51Gy (range: 20-57Gy). Five dogs (18.5%) had grade 3 acute skin toxicity; all received >51Gy. Five dogs (18.5%) developed progressive disease (PD) at a median of 664 days (range: 117-1215 days). Median PFS for all dogs was 1483 days (95%CI: 799-2167 days). Seven dogs were censored with median follow-up time of 1694 days (range: 1025-2360 days). Dogs that experienced PD had significantly larger GTV (median GTV 769.6cm³ vs 108.9cm³, p=0.005). Decreasing dose of RT was associated with shorter PFS[p=0.002, HR 0.894 (95%CI 0.831-0.961)]. There was no difference in PFS between microscopic and macroscopic tumors (p=0.99). However, increasing GTV was associated with decreased PFS (p=0.021). These data support the use of RT for long-term control of canine infiltrative lipoma. Higher total radiation doses may improve duration of tumor control.
Impact of Dose Rate on Response of Dogs with Sinonasal Neoplasia to Radiation Therapy

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Nasal tumors are commonly diagnosed in older dogs and radiation therapy is the standard-of-care treatment. Modern linear accelerators have adjustable dose rates and flattening-filter-free (FFF) beams allow higher dose rates. However, the impact of altering dose rate on treatment outcome for efficacy and side effects is not well documented in dogs. Our goal was to describe outcomes in dogs with sinonasal tumors following standard (SDR) or high dose-rate (HDR) radiotherapy for palliative- or definitive-intent. Cases presenting to the University of Illinois between June 2019 and January 2023 were retrospectively reviewed. Data from patient, tumor, and treatment variables were abstracted and compared. Outcome measures included tumor shrinkage following radiation, progression free and overall survival as well as additional therapy following an initial course of radiation therapy. Survival times, in days, were compared using student’s t-tests. Fifty-two dogs were included. Twenty-nine were treated with SDR (600 cGy/min with 6MV) and 23 with HDR (1400 cGy/min with 6MVFFF beam). Dogs were treated with definitive-intent (n=32: SRT=29, conventionally fractionated=4) or palliative-intent (n=19) protocols. Five dogs had lymph node metastasis and none had lung metastasis at initial presentation. At SDR, dogs treated with palliative-intent fared significantly worse than those treated with definitive-intent (median survival time (MST) 85d vs 490d, respectively, P=0.0002). Dogs treated with definitive-intent had an MST of 490d (range 237-1048) at SDR versus 219d (range 116-551) at HDR (P=0.01). In this series of dogs with sinonasal tumors, we found that dogs treated with HDR had shorter survival times than those treated with SDR.
Appendicular osteosarcoma can be treated with radiation therapy to palliate pain and avoid amputation of the affected limb. Cobalt-60 machines were used in early reports, whereas newer linear accelerators with variable dose rate settings and higher standard dose rate are now in widespread use. Radioactive decay of cobalt-60 results in a gradually decreasing dose rate which could result in a different biologic response, especially below 100 cGy/min. Our goal was to compare efficacy and toxicity following palliative radiation therapy with cobalt (variable dose rates below 100 cGy/min) versus linear accelerator/linac (600 cGy/min). Between April 2009 and December 2022, dogs (n=203) with appendicular osteosarcoma were treated with palliative external beam radiation therapy (10 Gy x 2 on consecutive days) using cobalt-60 (variable low dose rate) or linac (600 cGy/min). Most dogs also were treated with zoledronate. Time to first event (TTFE) was not significantly different between dogs treated with cobalt-60 (n=161) and those treated with a linac (n=38). There were 25 confirmed pathologic fractures in the cobalt-60 group (15.5%) and six in the linac group (15.7%); the cobalt-60 group included 7 cases with a TTFE of greater than 400 days (4%) compared to one in the linac group (3%). There was no apparent correlation among all low dose rates (range 25-80 cGy/min) with regards to TTFE. In this group of dogs, low dose rate radiotherapy was as efficacious as standard dose rate delivery using modern linacs. In addition, the rate of confirmed pathologic fracture was similar in the two groups.
Evaluating Clinical Response in Dogs with Presumed or Confirmed Intracranial Meningiomas Treated with Stereotactic Radiation Therapy

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Intracranial meningiomas are the most common primary brain tumor in dogs. Previous studies with radiation therapy showed MST ranging from 399-561 days with adverse events related to radiation in 34-42% of patients. This retrospective study aims to provide an update on clinical outcomes of dogs treated with stereotactic radiation therapy (SRT) at a standardized protocol of 24 Gy in 3 fractions. Dogs were included if they had an imaging-based diagnosis or histologically confirmed diagnosis of intracranial meningioma. All patients were diagnosed with advanced imaging alone (n=66, 97%) or in combination with incisional biopsy (n=2, 3.1%). The treatment field included the gross tumor volume (GTV) including the tumor seen on both CT and MRI, as well as a 1 mm isotropic expansion for the planning target volume (PTV). Preliminary data assessment showed a MST of 322 days (range 0-1485 days). Thirty-seven patients in this study were lost to follow-up after a mean of 229 days. Of the five patients that had assessment of volumetric response post SRT, two had a partial response (PR), one had a complete response (CR), one had stable disease (SD), and one had progressive disease (PD). Of the 42 patients who presented with seizures, 14 had resolution, 9 had improvement and 4 were stable. Of the 20 patients presenting with vestibular disease, 4 had resolution, 4 had improvement, and 1 was stable. The 4 patients that presented for blindness, did not regain vision. Data collection is ongoing with a plan to be completed in the coming months.
With the advent of more conformal, image-guided IMRT, radiation therapy is a non-invasive alternative option for dogs with adrenal tumors where surgical excision poses a high risk of complication. However, the role of radiation therapy is still unclear. This multi-institutional retrospective study is the largest yet to provide more data for adrenal tumors treated with image-guided IMRT. Fifteen patients were included ranging between 7-13 years of age, and most were mixed breeds. Clinical signs at presentation included polyuria, polydipsia, abdominal distension, pain, ascites, venous dilation, vomiting, diarrhea, anorexia, and hemiparesis. Most tumors were pheochromocytomas (n=12) based on cytology, urine metanephrine/normetanephrine, histopathology, and/or clinical signs. Vascular invasion was observed in 14 dogs. Eight patients received SBRT (3-5 fractions of 6-11Gy), five received a hypofractionated protocol (8-15 fractions of 3-4.2Gy), and two received a palliative protocol (4x6Gy or 5x5Gy). For the 14 patients with follow-up staging, ORR was 92.8% (5SD, 6PR, 2CR). PFS was 717 days (range, 100-2263), and OST was 746 days (range, 100-2263). Six patients (40%) experienced VRTOG grade 2 acute gastrointestinal AEs that resolved in 2 weeks to 4 weeks. Up to 3 patients (20%) experienced grade 3 acute gastrointestinal AEs, and two of these patients were euthanized due to the AEs. Both received SBRT 3x11Gy. One patient developed chronic diarrhea as a potential late-term AE. This study showed that radiation therapy is an effective, non-invasive alternative for surgery for adrenal tumors but with increased risks of severe adverse effects when larger doses per fraction were utilized (>10Gy).
Outcomes Following Radiation Therapy for Dogs with Pericardial Effusion Secondary to Suspected Cardiac Hemangiosarcoma

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Canine hemangiosarcoma is a tumor of malignant endothelial cells and is one of the two most reported tumors at the cardiac heart base. Radiation therapy has been previously shown to be well-tolerated in dogs with pericardial effusion, even demonstrating decreased hemorrhagic events following a single treatment to the heart base. Our retrospective study aims to provide an updated assessment of outcomes following radiation therapy with varied protocols and examine the benefit of adjuvant chemotherapy in this setting. Twenty-seven patients were included with two patients treated twice. All patients received an echocardiogram prior to treatment that identified a mass near the right atrium, auricle, or atrioventricular groove. Of the 29 treatments, 16 cases were treated with 3D-CRT or IMRT and 13 received a manual setup. There were no significant radiation-induced side effects noted. The overall MST was 123 days (range: 2-553 days). Median time in the lost-to-follow up group (7) was 56 days. Adjuvant chemotherapy was elected in 16 of the 27 dogs. MST was 123 days for dogs that received chemotherapy vs 140 days without chemotherapy (p = 0.91). The authors aim to assess whether initial diagnostic results prior to radiation therapy correlate with outcomes. A secondary objective is to assess whether the radiation delivery modality or elected protocol affected outcome. The third goal was to assess end-of-life outcomes, regarding what percentage ultimately succumbed to the primary site, metastatic disease, or other. Further expansion on findings and discussion is planned as data analysis is continued over the coming months.
Salivary Analysis in Dogs Treated with Definitive Radiation Therapy for Head and Neck Cancer

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Xerostomia ("dry mouth") is one of the most common side effects in humans with head and neck cancer undergoing radiation therapy. There is little to no data in the literature describing the incidence or impact of radiation-induced xerostomia on canine patients. The purpose of this study is to characterize the effect of definitive radiation therapy on salivary composition and swallowing kinetics for patients with head and neck cancer. Saliva composition, video/audio analysis, and videofluoroscopy are evaluated to assess for xerostomia. Analysis is performed at the start of radiation and then at set intervals after the completion of radiation.

Nine healthy dogs were used as controls for saliva composition and video/audio analysis. Currently, saliva analysis has been performed in ten patients undergoing definitive radiation therapy. At the start of treatment, the patients mean LDH, calcium, amylase, and phosphorus were 3770.8, 11.24, 60.4, and 2.29, respectively. The mean values at 3-months post radiation were 4190.8, 8.74, 47.4, and 5.14, respectively. The saliva composition has changed in each patient but no apparent trend across the patient population has been appreciated. There has been a subjective increase in the time for saliva collection post radiation, which is now being recorded. The video/audio analysis and videofluoroscopy portion of the study are underway.

The data collected from this study will help determine whether canine patients develop symptoms of xerostomia following radiation therapy. This information can be used to help clinicians better identify this condition and implement strategies to alleviate clinical signs.
Computed tomographic measurements of spleens in healthy and Aspergillosis-infected Kakapo (Strigops habroptilus) adults and chicks.

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The spleen is an important immunological organ in birds and splenomegaly is expected with systemic infections and inflammatory disease. There is a paucity of peer-reviewed studies that describe normal versus abnormal splenic sizes to help determine when disease is present versus resolution. A retrospective study was performed to quantify splenic size into systemically healthy, sick and recovered birds divided into adults and chicks. Measurements acquired were 1) the greatest dimension and 2) the sum of the greatest dimension and its two orthogonal measurements. Two-tailed T-tests were used to compare a) splenic measurements at diagnosis and clinical recovery, b) healthy to sick birds at the time of diagnosis, and c) healthy adults to chicks. The only statistical significance identified was between healthy adult and chick splenic sizes. No significant difference was identified between age-matched healthy and sick birds or between the day of diagnosis versus recovery. Percentage variation in splenic measurements were calculated for all Aspergillosis birds and was highly variable between day of diagnosis and declared clinically recovered. This may suggest that that individuals respond to the systemic infection with splenomegaly, mount a response without significant hyperplasia or failed to mount a response altogether. In sick chicks with Bursa of Fabricus, responses may be shared with the spleen. In conclusion, splenic size cannot be used to determine the presence, absence or recovery from Aspergillosis infection; splenic size over the course of systemic Aspergillosis infection may vary mildly or greatly, and increasing or decreasing in splenic size as the bird recovers.
Computed tomography (CT) is a valuable diagnostic technique in the clinical work-up of dogs with suspected vascular lesions. Pseudoaneurysms are an accumulation of blood extra-luminally contained by the adventitia layer or nearby tissues. These lesions are caused by damage to the vessel wall due to trauma, degenerative or erosive disease processes. Purpose of this retrospective, multi-centre, observational, case series study was to describe the CT features of pseudoaneurysms and their potential causes in dogs. We hypothesized that (1) pseudoaneurysm can be identified on CT as a small area of marked vascular contrast enhancement in the vicinity of a vessel contained by soft tissue structures and (2) that there is evidence of vascular trauma associated with the pseudoaneurysm. Medical records archives were searched for canine patients with bleeding, imaging archives were searched for CT studies with visible extravasation of contrast-enhanced blood. Three dogs met the inclusion criteria. CT findings included a well-defined, confined area of vascular contrast enhancement adjacent to the carotid or maxillary artery. 4DCT demonstrated contrast medium leaking from the vessel and becoming restricted between the adjacent structures. All dogs had signs of trauma, either a bone fracture or penetrating lesion. Vascular pseudoaneurysm should be considered a differential diagnosis in dogs with CT features of a well-defined, perivascular, strongly contrast-enhancing lesion, particularly in cases of suspected local bleeding. 4DCT is helpful to confirm active extravasation.
Tympanic membrane perforations are not reliably detected on CT

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Average accuracy for the detection of tympanic membrane perforation on CT in a cadaver dog model is low (44%) with fair interobserver agreement among four radiologists.

The integrity of the tympanic membrane is an important factor when deciding treatment and therapeutic recommendations for dogs with ear disease; however, otoscopic examination may be difficult to perform due to features of external ear canal disease or patient compliance. Computed tomography (CT) is useful for the evaluation of middle ear disease, including cases in which middle ear disease is detected incidentally. The tympanic membrane is detectable using CT but, anecdotally, apparent focal defects or discontinuities of the tympanic membrane are often seen in patients with and without ear disease. The purpose of this prospective, observer agreement study was to determine if perforations of the tympanic membrane are reliably detectable on CT. Fifteen cadaver dogs underwent CT and video otoscopy to verify the integrity of each tympanic membrane. Cadavers were randomly assigned to be left intact or to undergo a myringotomy on either the left ear, the right ear, or both ears. CT was performed immediately following the myringotomies. Four blinded radiologists evaluated the pre- and post-myringotomy scans for a total of thirty scans (sixty tympanic membranes). Interobserver agreement for all four readers was fair, while average accuracy for detection of tympanic membrane perforation was low (44%). Although the tympanic membrane is visible on CT, perforations of the tympanic membrane are unlikely to be accurately detected or excluded. An apparently intact tympanic membrane or defect in the membrane on CT should not be used as criteria to guide clinical treatment recommendations based on this cadaver model.
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