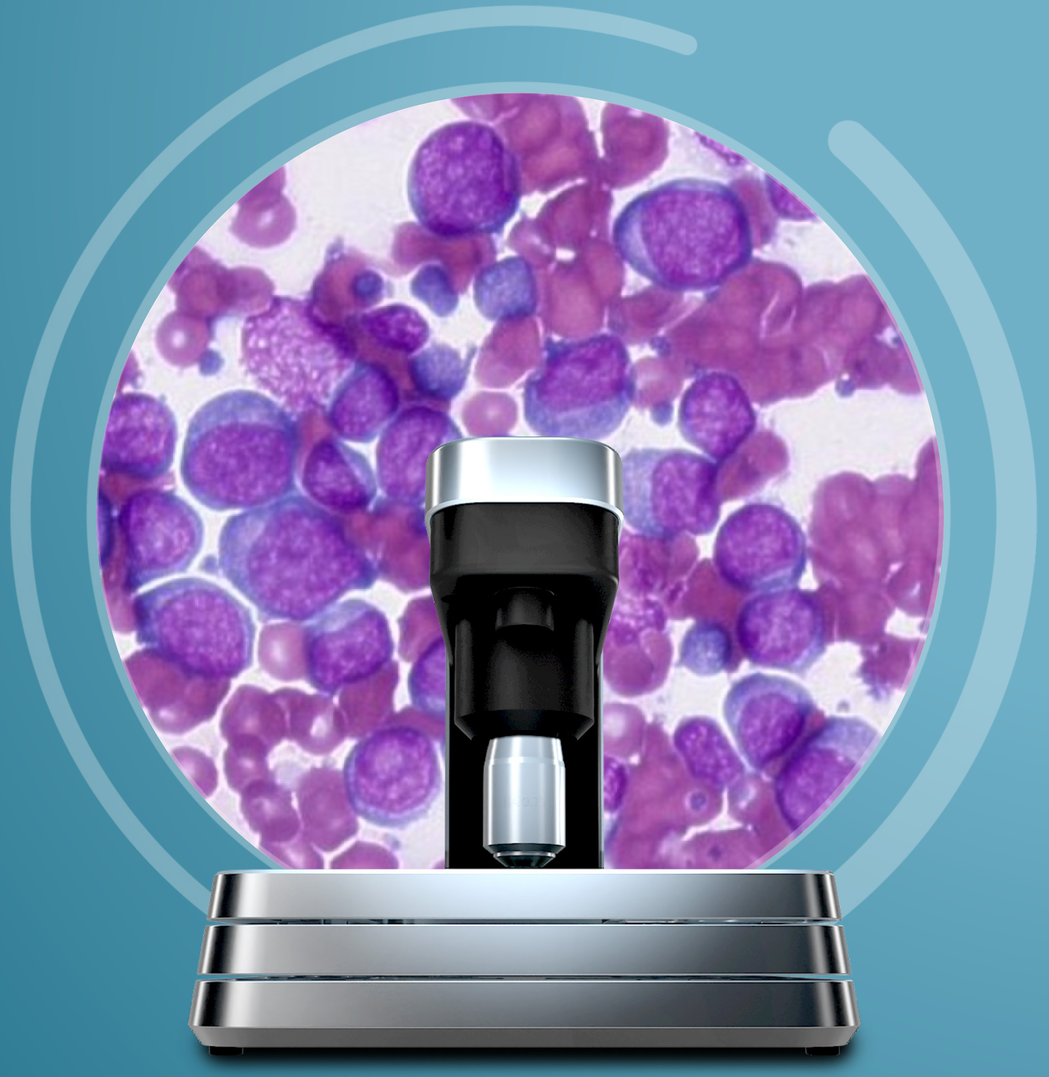
ZOETIS DIAGNOSTICS

vetscan Imagyst®

Hospital Resource Guide

Digital Cytology & AI Masses



zoetis

Welcome

to the Vetscan Imagyst® Digital Cytology and AI Masses Hospital Resource Guide.

This guide is designed to give you everything you need to get the most out of the Vetscan Imagyst Digital Cytology and AI Masses applications. Throughout the chapters listed, you will find links to supplemental resources to help address questions.

We hope you find this guide useful. And as always, contact your local Diagnostic Technical Support team for further assistance.

Need Guidance on a Treatment Plan?

Discuss results and a path forward for complex cases with remote specialist consultations when clinically warranted.* Schedule at ZoetisDx.com.

*Requires the use of Vetscan® Fuse or Vetscan Hub™ at least one Zoetis Diagnostics analyzer or service.

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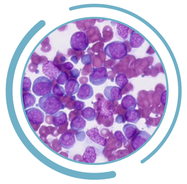
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Vetscan Imagyst Overview

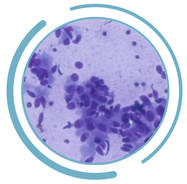
What Is Vetscan Imagyst?

The Vetscan Imagyst is an in-clinic analyzer powered by artificial intelligence (AI) that features multiple testing capabilities on a single platform. This multi-use diagnostic tool streamlines your point-of-care workflow with simple setup and comprehensive, repeatable diagnostic findings comparable to a clinical expert in just minutes.[1-11] With remote expert review* available whenever clinically warranted, you can make diagnostic and treatment decisions quickly and with confidence.



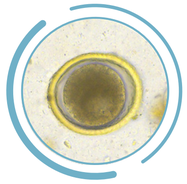
AI Masses

- Identifies cells in common lymph node and skin/subcutaneous masses suggestive of pathology
- Rapid point-of-care identification in minutes can help reduce wait times and the anxiety waiting causes



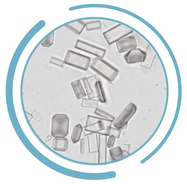
Digital Cytology

- Digital access to board-certified clinical pathologists
- Specialist insights within within hours or next day[12]



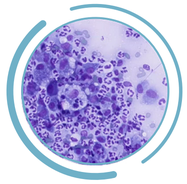
AI Fecal

- Detects specific parasite ova, cysts and oocysts for dogs and cats[13,14]
- Clean, efficient approach to fecal analysis
- Equine-specific AI identifies and classifies fecal parasite ova in minutes



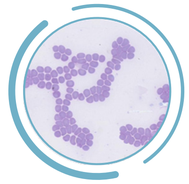
AI Urine Sediment

- Evaluates ~1000 fields of view for critical urine sediment elements
- Point-of-care testing reduces sample changes due to delayed testing[15,16]



AI Dermatology

- Analyzes skin impression smears and skin and ear swabs to identify yeast, inflammatory cells and bacteria
- Differentiates between cocci and rod bacteria



AI Blood Smear

- Identifies hematologic abnormalities
- Supplements CBC results for a comprehensive hematology picture

*Option to send digital slide image to our network of pathologists as needed. Additional costs may apply.

References: 1. Data on file, Study No. DHXMZ-US-25-285, 2025, Zoetis Inc. **2.** Data on file, Study No. DHXMZ-US-25-286, 2025, Zoetis Inc. **3.** Data on file, Study No. DHX6Z-US-23-205, 2024, Zoetis Inc. **4.** Data on file, Study No. DHX6Z-US-23-206, 2024, Zoetis Inc. 5. Data on file, Study No. DHX6Z-US-23-209, 2024, Zoetis Inc. **6.** Data on file, Study No. DHX6Z-US-24-257, 2024, Zoetis Inc. **7.** Data on file. Study No. DHX6Z-US-24-242, 2024, Zoetis Inc. **8.** Data on file, Study No. DHX6Z-US-24-275, 2024, Zoetis Inc. **9.** Data on file, Study No. DHX6Z-US-24-276, 2024, Zoetis Inc. **10.** Data on file, Study No. DHX6Z-US-23-222, 2023, Zoetis Inc. **11.** Data on file, Study No. DHX6Z-US-22-131, 2022, Zoetis Inc. **12.** Data on file, Study No. TI-11711 2024, Zoetis Inc. **13.** Data on file, Study No. DHX6Z-US-24-257, 2024, Zoetis Inc. **14.** Data on file, Study No. DHX6Z-US-24-242, 2024, Zoetis Inc. **15.** Chew, Dennis and DiBartola, Stephen. Interpretation of Canine and Feline Urinalysis. Nestle Purina, Wilmington, DE. 2004: p.1-31. **16.** Chew, Dennis and Schenck, Patricia A. Urinalysis in the Dog and Cat. First edition. Wiley Blackwell. 2023: p.162-217.

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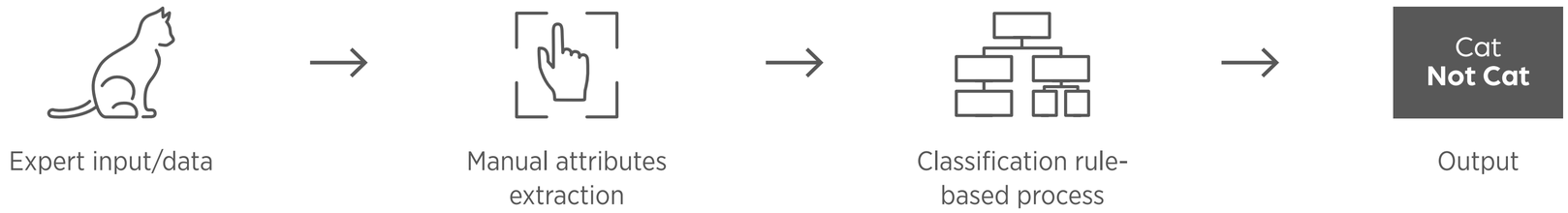
AI–Powered Image Recognition: How It Works

The Vetscan Imagyst leverages deep-learning AI to extract thousands of features that may otherwise be missed with superficial-learning AI algorithms, as seen in Figure 1.1.

Figure 1.1 *Superficial vs. Deep Machine Learning*

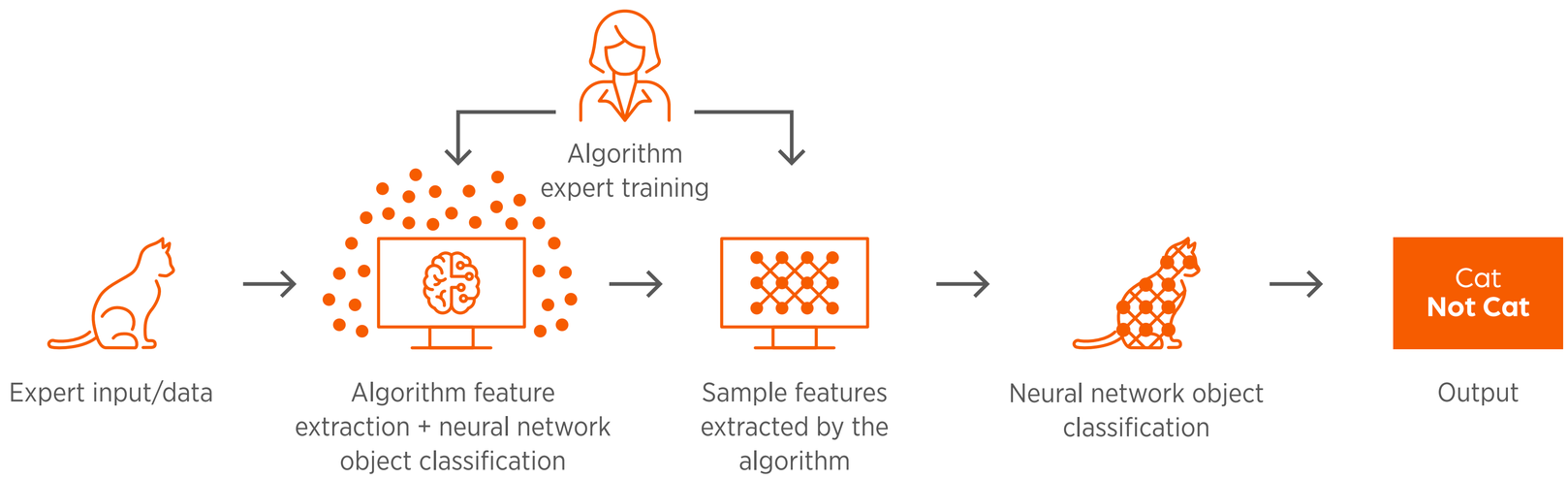
Superficial Learning (Machine Learning)

Manually trained by an expert for attributes that will differentiate objects that can be seen with the naked eye.



Convolutional Neural Network (Deep–Learning)*

Trained by showing thousands of individual expert-classified images to the algorithm. The algorithm then extracts features that cannot be detected with the naked eye.



The deep-learning system utilized for the Vetscan Imagyst is a convolutional deep neural network, which uses many narrow filters to extract a large quantity of features from a selected sample image. Those features are then applied to the deep-learning neural network to enhance accuracy and automate sample analysis to reduce hands-on staff time.

*Vetscan Imagyst

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Vetscan Imagyst Overview

Why AI Masses?

Part of the innovative, multi-use Vetscan Imagyst platform from Zoetis, Vetscan Imagyst AI Masses brings cutting-edge AI analysis of common lymph node and skin/subcutaneous masses to our comprehensive digital cytology offering, for fast answers and less wait time.

Can help enable fast, accurate[1–2], in-clinic screening with best-in-class* AI

- **Analysis of potentially neoplastic cells** in common lymph node and skin/subcutaneous masses
- **Accurate[1-2] results in minutes** so you can plan next steps on your timeline
- **Feel supported in your diagnosis** with Add-on Expert Review†

Can help improve efficiency without changing workflow

- Can enable **in-clinic diagnosis of cases within minutes** — no waiting for answers
- Clear, detailed reports with images that **can help inform decisions**
- **Familiar, one-time sample preparation** for both AI and expert review†

Increased accessibility to care can help improve compliance

- Fast in-clinic testing **can help increase customer compliance**
- Quick answers can help **keep cases in-clinic**
- Easy **access to experts in 14 specialties** with complimentary consultations

*Vetscan Imagyst is the only commercial AI analyzer available on the market offering six testing capabilities.
†Option to send digital slide image to our network of pathologists as needed. Additional costs may apply.

References: 1. Data on file, Study No. DHXMZ-US-25-285, 2025, Zoetis Inc. **2.** Data on file, Study No. DHXMZ-US-25-286, 2025, Zoetis Inc.

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Vetscan Imagyst Overview

Why Vetscan Imagyst Digital Cytology?

Unlocks deep insights and the freedom to make timely, individualized diagnosis and treatment decisions at the point-of-care for every case.

Vetscan Imagyst Digital Cytology, part of the unique, multi-use Vetscan Imagyst platform from Zoetis, accelerates the process for expert clinical pathology review. It offers digital cytology review by board-certified clinical pathologists within hours or next day*[1].

Accelerated access for assisting with better clinical outcomes

- Get **actionable insights** next day or within hours[1] for urgent review
- Can help enable **important diagnostic and treatment decisions** sooner
- Offers your patients **specialist-level care** in your clinic

Digital image transfer can help simplify the expert review process

- **Easy, in-clinic preparation** of samples and slides
- Confirmation of image upload within **minutes**
- **Digital submission** can help eliminate risk of slide damage or loss

Anytime* expert support provides a valuable service

- Consult with the **Global Clinical Consulting service** at no cost
- **Access** to experts in 14 different specialties*
- **Easily book consults** through the ZoetisDx portal

The Freedom to Choose

Zoetis provides support from every angle, with the freedom to make individualized diagnostic and treatment decisions that fit your patients' needs:

1. Get rapid analysis of common lymph nodes and skin/subcutaneous masses at the point-of-care with Vetscan Imagyst AI Masses, supported by expert clinical pathologist review† from Vetscan Imagyst Digital Cytology.
2. With the full Digital Cytology offering, you can analyze a variety of samples across all species for expert-level insights across a wide range of cases, with flexible results delivery options based on your timeline.
3. The Zoetis Virtual Laboratory combines cutting-edge AI and specialist expertise for comprehensive results, with a complimentary clinical consultation service for the full spectrum of care.

*Dependent on consultant availability.
†Option to send digital slide image to our network of pathologists as needed. Additional costs may apply.

Reference: 1. Data on file, Study No. TI-10365, 2023, Zoetis Inc.

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The Zoetis Virtual Laboratory

Bringing Specialist Level Medicine to Your Clinic

The Zoetis Virtual Laboratory is an integrated support network of board-certified specialists paired with expert-level[1-12] AI, enhancing every element of your diagnostic practice to help you make diagnostic and treatment decisions with confidence.



References: 1. Data on file, Study No. DHXMZ-US-25-285, 2025, Zoetis Inc. **2.** Data on file, Study No. DHXMZ-US-25-286, 2025, Zoetis Inc. **3.** Data on file, Study No. DHX6Z-US-23-205, 2024, Zoetis Inc. **4.** Data on file, Study No. DHX6Z-US-23-206, 2024, Zoetis Inc. **5.** Data on file, Study No. DHX6Z-US-23-209, 2024, Zoetis Inc. **6.** Data on file, Study No. DHX6Z-US-24-257, 2024, Zoetis Inc. **7.** Data on file. Study No. DHX6Z-US-24-242, 2024, Zoetis Inc. **8.** Data on file, Study No. DHX6Z-US-24-275, 2024, Zoetis Inc. **9.** Data on file, Study No. DHX6Z-US-24-276, 2024, Zoetis Inc. **10.** Data on file, Study No. DHX6Z-US-23-222, 2023, Zoetis Inc. **11.** Data on file, Study No. DHX6Z-US-22-131, 2022, Zoetis Inc. **12.** Data on file. Study No. DHXMZ-US-24-235, 2024, Zoetis Inc.

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Why Cytology?



Introduction to Cytology

Cytology is a first-line diagnostic that evaluates individual cells or groups of cells microscopically to identify their source and any findings distinctive of disease.[1] By examining cells and their characteristics, cytology can provide information about a disease process via a collection technique that often doesn't require sedation.

Cytology Can Aid In:

– Establishing a working diagnosis

– Providing preliminary prognosis

– Therapeutic interventions (such as planning surgery)

– Suggesting further diagnostic testing

Why Use Cytology?

Cytological analysis helps guide diagnostic and therapeutic decision-making, enabling a more informed assessment of the potential benefits and risks prior to surgical intervention. It also provides insights that inform preoperative planning and post-surgical treatment.

Cytology Benefits

– Minimally invasive with less patient discomfort

– Often doesn't require sedation

– Relatively inexpensive vs. surgical biopsy

– Rapid results

– Often provides a definitive diagnosis or can narrow differential diagnoses

Reference: 1. Monte P and Cian F. Chapter 21 Diagnostic Cytology, BSAVA Manual of Canine and Feline Clinical Pathology, p.398.

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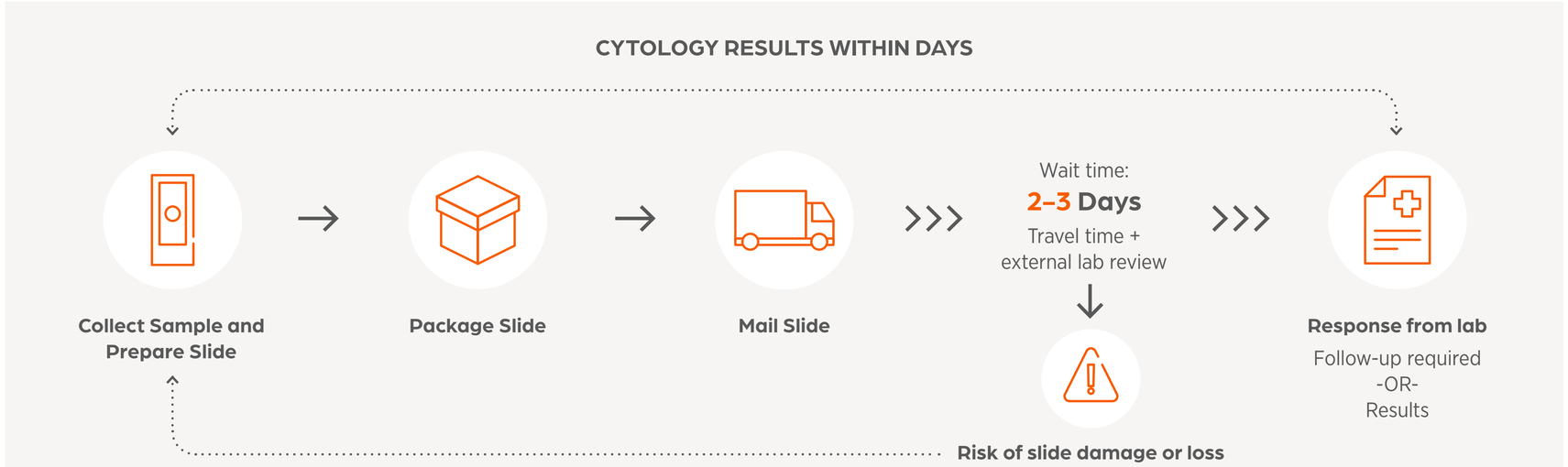
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Why Cytology?

Vetscan Imagyst Digital Cytology vs. Traditional Cytology

Traditional cytology workflow:



Vetscan Imagyst Digital Cytology addresses some of the most common issues associated with traditional cytology:

Issue	Vetscan Imagyst Solution
Pet owners object to the high cost of cytology	Low cost of entry for Vetscan Imagyst Digital Cytology
Traditional cytology takes time to receive results. This can be even more frustrating when it's difficult to get a quality sample, resulting in long wait times for indeterminate results	Get answers quickly, so you lose less time should you need an additional sample
Cytology is inefficient and takes too long for me to make clinical decisions	Specialist insights available when you need them with flexible results delivery options that are easily accessible through the ZoetisDx portal, to guide fully informed diagnostic and treatment decisions – Vetscan Imagyst Digital Cytology delivers results next day or within hours[1] with Urgent Review – Vetscan Imagyst Digital Cytology is 120 times faster* than traditional cytology: 43 minutes vs. 3.6 days[2] – 63% of pet owners **prefer to see results in the same visit**[3]

*On average

References: 1. Data on file, Study No. TI-11711, 2024, Zoetis Inc. **2.** Mwacalimba K, Melchior E, et al. Case Study Series: Clinical Impact of Vetscan Imagyst AI digital cytology and Virtual Laboratory on patient outcomes. Animal Medical Center of Euclid. Study No. 23SORDIA-01-02. Zoetis Inc.: 2024. **3.** Zoetis. U.S. Market Research: Client Experience Diagnostics. January 24, 2024.

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Why Cytology?

What Is Digital Cytology?

Digital cytology is a digital cytopathology service. It involves digital image transfer of a whole slide image (WSI) to board-certified clinical pathologists. The clinical pathologist will perform a microscopic evaluation of the WSI looking at individual cells or groups of cells to determine their origin and any changes characteristic of disease.

Benefits of Digital Cytology vs. Cytology

Fast results:

With flexible results delivery options, get results when you need them versus a couple of days if you send the sample to an external lab.

Upgrade your practice's expertise:

Easy and fast access to a variety of experts can help improve the level of care your practice can provide. With that level of expertise, you can make critical decisions promptly, benefitting the patient and pet owner.

Access to an expert:

You are quickly put in contact with an expert clinical pathologist who reviews your slides and provides results within hours[1] or next day to match patient needs*. If you have questions about the results, you can consult with the pathologist. If you have questions about next steps, you can schedule a specialist consultation via Zoom™† or email for more information at no extra charge.

Greater efficiency:

In addition to reducing the time to results, digital cytology also reduces the risk associated with sample loss or damage during physical transport to a lab. If there are sample concerns, you will get support from a board-certified clinical pathologist to assist with sample interpretation.

*Option to send digital slide image to our network of pathologists as needed. Additional costs may apply.
†Zoom is a trademark of Zoom Video Communications, Inc.
Reference: 1. Data on file, Study No. TI-11711, 2024, Zoetis Inc.

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Why Cytology?

Vetscan Imagyst Digital Cytology and AI Masses reduce your wait time for results and eliminate the need to package and mail slides, keeping cases in-clinic to help increase compliance:

Vetscan Imagyst digital cytology workflow:

FLEXIBLE CYTOPATHOLOGY RESULTS OPTIONS WITHIN HOURS[1] OR NEXT DAY



Collect Sample and Prepare Slide

Scan
Confirmation of image upload within minutes

Expert review and result reporting

Know

AI Masses workflow:

RESULTS IN MINUTES



Collect and Prepare Slide

Scan

Results in minutes

Add-on Expert Review is available; additional costs may apply*

Know

*See Section 5, Interpretation Atlas, for additional guidance on when Add-on Expert Review is clinically warranted.

Reference: 1. Data on file, Study No. TI-11711, 2024, Zoetis Inc.

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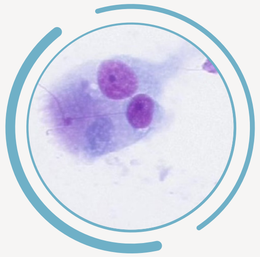
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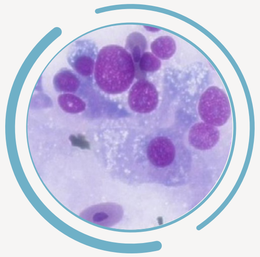
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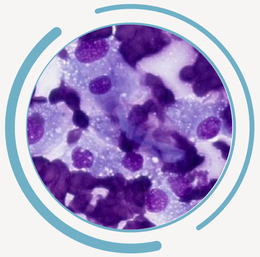
Vetscan Imagyst Digital Cytology Offers Fast Review of A Variety of Cytology Specimens



Feline Ciliated
Respiratory Epithelial Cell



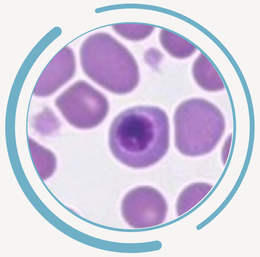
Bearded Dragon
Granulomatous Inflammation



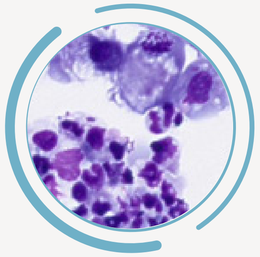
Canine Soft
Tissue Sarcoma



Canine Round
Cell Tumor



Canine Regenerative Anemia
with Metarubricytosis



Equine Bronchoalveolar Lavage
with Mild Neutrophilia

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Why Cytology?

What Types of Samples Can Be Processed with Vetscan Imagyst Digital Cytology?

Vetscan Imagyst Digital Cytology can be Used to Examine the Same Tissues and Fluids as Traditional Cytology in Dogs and Cats:



Felines



Canines

Tissues that can be examined include:	Fluids that can be examined include:
Lymph nodes*	Urine (wet* or dry prep)
Visceral organs (e.g.,liver, kidney, pancreas, intestines, spleen)	Cerebrospinal fluid (CSF)†
Musculoskeletal (e.g., muscle, bone, joints)	Aqueous/vitreous humor
Ear*	Blood*
Skin (cutaneous and subcutaneous)*	Transtracheal wash (TTW)/Bronchoalveolar lavage (BAL†)/ nasal flush
Oral	Urinary tract wash
Reproductive (e.g., ovaries, uterus, mammary, prostate, testes)	Synovial/joint
Brain	Pericardial‡
Eyes/adnexa	Peritoneal/abdominocentesis‡
	Pleural/thoracocentesis‡

*AI analysis available for results within minutes
†Advanced sample preparation techniques required
‡May require advanced sample preparation techniques

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- The Basics: Best Practices
- Required Materials and Components
- Step-by-Step Sample Prep Instructions by Test Type
- Tissues
- Fluids

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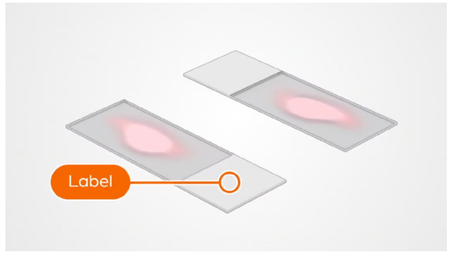
Sample Preparation

for Vetscan Imagyst AI Masses and Digital Cytology

The Basics: Best Practices

Properly prepared slides are crucial for accurate testing and optimal patient care. While sample preparation varies depending on sample type, there are some general best practices to follow:

Figure 3.1 *Vetscan Imagyst AI Masses Quick Start Guide*



Sample Collection and Handling

1. Use new, clean glass slides with a frosted edge
2. Ensure slides are labeled clearly in pencil with the patient's name and sample source
   - Ink labeling can wash off during staining
   - Do not label the slide box only
3. Collect your sample using the appropriate method for the test type
4. Do not heat fix when drying the slide



Keys to Excellent Stain Quality

- ✓ Always stain samples using a quick stain (e.g., Diff Quik™ or other Romanowsky-type stain) according to manufacturer's protocol
- ✓ A dip method is recommended versus flooding the slides with stain to ensure uniform staining
- ✓ Stains should be changed out regularly to avoid depletion and build up of stain
- ✓ Avoid heating, freezing, or refrigerating cytology slides, which may distort cells
- ✓ Ensure unstained cytology slides are not collected in the vicinity of formalin or formalin vapors. Exposure of cytology specimens to formalin prior to staining may make the slides uninterpretable as formalin interferes with cell staining
- ✓ Alternative staining techniques such as Gram staining or urine sediment (supravital) stain are not acceptable for submission

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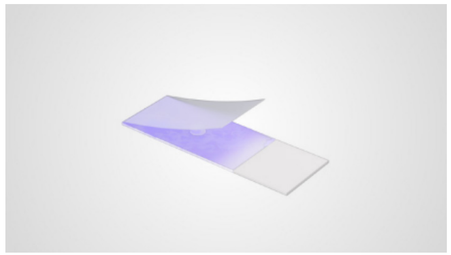
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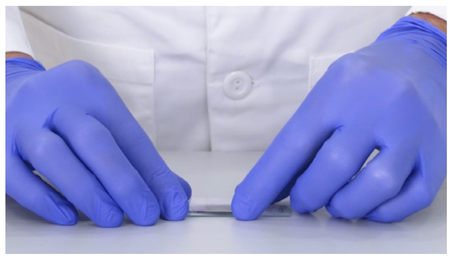
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Sample Preparation

Figure 3.1 *Vetscan Imagyst AI Masses Quick Start Guide (cont'd)*





Coverslipping

- ✓ Use a Zoetis-issued or similar coverslip (24 x 60 mm; 0.13-0.17 mm thickness)
- ✓ Ensure that only one coverslip is used, as coverslips can easily stick together
- ✓ Always use a coverslip

Coverslipping Steps

1. Place the stained slide on a flat surface
2. Add immersion oil to the surface of the sample. Use only enough to cover the sample, as excess oil can contaminate the scanner lens
3. Handle the coverslip by its edge to avoid fingerprints
4. Place the edge of the coverslip onto the sample and lay it gently over the sample, avoiding the formation of air bubbles
5. Blot excess oil with a delicate task wipe or lotion free tissue

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Required Materials and Components

Every sample preparation for Vetscan Imagyst AI Masses and Digital Cytology requires the following materials and components, as outlined in Figure 3.2, regardless of test type:

Figure 3.2 *Vetscan Imagyst AI Masses Standard Materials*



Additional Information for Submission

- ✓ Well-rounded view of the patient history (include breed, age, gender)
- ✓ Visual description of the sample and sample parameters (e.g., body site of the sample, fluid characteristics, color)
- ✓ Other relevant test results (e.g., minimum database testing)

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Step–by–Step Sample Prep Instructions by Test Type

This section provides instructions for sample preparation for each of the following test types:

Table 3.3 *Test Types included in Step–by–Step Sample Prep Instructions*

Tissues	Fluids
Lymph node*	Urine (wet* or dry prep)
Visceral organs (e.g., liver, kidney, pancreas, intestines, spleen)	Cerebrospinal fluid (CSF)†
Musculoskeletal (e.g., muscle, bone, joints)	Aqueous/vitreous humor
Ear*	Blood*
Skin (cutaneous and subcutaneous)*	Transtracheal wash (TTW)/Bronchoalveolar lavage (BAL†)/ nasal flush
Oral	Urinary tract wash
Reproductive (e.g., ovaries, uterus, mammary, prostate, testes)	Synovial/joint
Brain	Pericardial‡
Eyes/adnexa	Peritoneal/abdominocentesis‡
	Pleural/thoracocentesis‡

*AI analysis available for fast results
†Advanced sample preparation techniques required
‡May require advanced sample preparation techniques

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Sample Preparation

Tissues

In this section, you will find detailed sample preparation tips and instructions for tests involving tissues:

Fine Needle Aspiration/Biopsy

Fine needle aspiration and fine needle biopsy can be used for visceral organs, brain, reproductive organs, cutaneous masses, lymph nodes, bone and muscle.

Required Materials

Figure 3.4 *Vetscan Imagyst Required Materials for Fine Needle Aspiration (FNA) and Fine Needle Biopsy (FNB)*



20/22 gauge needle



3 or 6 mL syringe

Keys to Excellent Stain Quality

- ✓ Use fresh stain
- ✓ Prepare slides with well-stained, thinly spread samples
  - You can submit one slide for one site with AI Masses
  - You can submit a maximum of two different tissue sites/sources, and up to four slides, for Digital Cytology
- ✓ Relevant history/mass description

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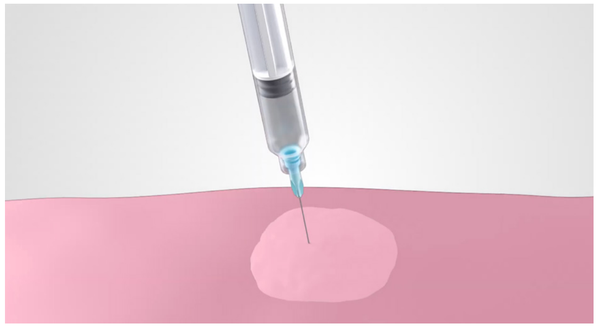
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Sample Preparation

Sample Prep Technique – Fine Needle Aspiration (FNA)

Fine needle aspiration is useful for lesions, internal organs and fluids, and masses if there is concern that the mass will exfoliate poorly.



Step 1
Prepare the slides

1. Once the sample has been collected, position several slides label-side up
2. Gently depress the plunger to eject needle contents onto the first slide. Remove the needle from the syringe and withdraw the plunger to fill it with air
3. Replace the needle on the syringe and depress the plunger again to eject contents on the second slide
4. Repeat until no sample remains inside the needle
5. Take a fresh glass slide and gently place it on top of the sample. Without applying pressure, gently pull the two slides apart in a smooth horizontal motion
6. Place both the sample and spreader slides sample-side up to rapidly air dry. Repeat for each subsequent slide

Step 2
Stain the slides

1. Once the slides are fully air-dried, stain the slides using a Romanowsky-type stain (e.g., Diff Quik™), closely adhering to the manufacturer's instructions for processing, and allow it to dry

Step 3
Add immersion oil and coverslip

1. After the slide has been stained and air-dried, place a drop of immersion oil on the smear
2. Place a 24 x 60 mm coverslip on the slide
3. The immersion oil will allow the coverslip to adhere to the slide
4. Now the sample is ready to be processed

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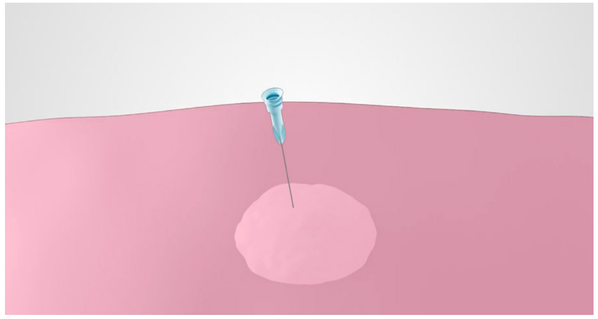
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Sample Preparation

Sample Prep Technique – Fine Needle Biopsy (FNB)

Fine needle biopsy (without aspiration) is preferred for most masses (See pg. 19, Fine Needle Aspiration for exceptions).

Impression smears and swabs can be used for making imprints from a biopsy specimen or from superficial/draining masses not amenable to FNA, but interpretation may be limited. They also may not adequately sample cell populations or organisms deeper in tissue.



Step 1
Prepare the slides

1. Once the sample has been collected, position several slides label-side up
2. Gently depress the plunger to eject needle contents onto the first slide. Remove the needle from the syringe and withdraw the plunger to fill it with air
3. Replace the needle on the syringe and depress the plunger again to eject contents on the second slide
4. Repeat until no sample remains inside the needle
5. Take a fresh glass slide and gently place it on top of the sample. Without applying pressure, gently pull the two slides apart in a smooth horizontal motion
6. Place both the sample and spreader slides sample-side up to rapidly air dry. Repeat for each subsequent slide

Step 2
Stain the slides

1. Once the slides are fully air-dried, stain the slides using a Romanowsky-type stain (e.g., Diff Quik™), closely adhering to the manufacturer's instructions for processing, and allow it to dry

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Sample Prep Technique – Fine Needle Biopsy (FNB) (cont'd)

Step 3
Add immersion oil and coverslip

1. After the slide has been stained and air-dried, place a drop of immersion oil on the smear
2. Place a 24 x 60 mm coverslip on the slide
3. The immersion oil will allow the coverslip to adhere to the slide
4. Now this sample is ready to be processed

Tips for Success

Do	Do not
✓ Hold the sample slide and spreader slide above the table to help ensure that no pressure is applied during the spreading process	× Pull slides in a vertical fashion, as cells may not spread thinly enough for optimal assessment
✓ Stain additional slides as needed if initially stained preparations do not appear cellular	× Heat fix when drying the slide
	× Apply excessive pressure on the spreader slide to promote cell preservation, and prevent cell lysis

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Sample Preparation

Dermatology — Swabs and Impression Smears

Required Materials

Figure 3.5 *Vetscan Imagyst Required Materials for Dermatology — Swabs and Impression Smears*



6-inch cotton-tipped swabs

Key Components

- ✓ Air-dried stained ear or skin swab
- ✓ Air-dried stained skin impression smear

Sample Prep Technique — Skin and Ear Swabs

Step 1

Prepare the slides

1. Once the sample has been collected, roll the swab across the surface of slide
2. Air dry to avoid heating artifacts

Step 2

Stain the slides

1. Once the slides are fully air dried, stain the slides using a Romanowsky-type stain (e.g., Diff Quik™), closely adhering to the manufacturer's instructions for processing, and allow it to dry

Step 3

Add immersion oil and coverslip

1. Once the slides are fully air-dried,, place a drop of immersion oil on the smear
2. Place a 24 x 60 mm coverslip on the slide
3. The immersion oil will allow the coverslip to adhere to the slide
4. Now this sample is ready to be processed

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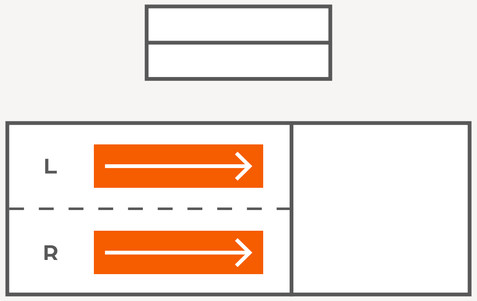
Sample Prep Technique — Left and Right Ears on the Same Slide

Once the samples are collected (see pg. 22, Sample Prep Technique — Skin and Ear Swabs), there are two options when positioning left and right ear samples on one slide:

Figure 3.6 *Vetscan Imagyst Sample Prep Technique for Left and Right Ears on the Same Side, Horizontal and Vertical Orientations*

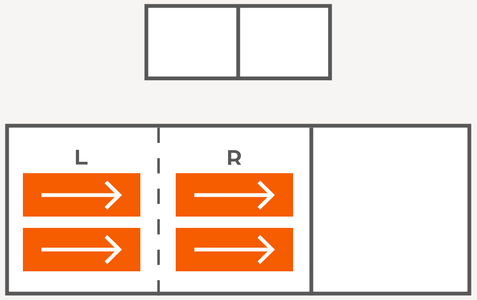
HORIZONTAL ORIENTATION

1. Roll samples across the slide from non-frosted edge to frosted edge (arrow shown) with left ear swab on top and right ear swab on bottom.



VERTICAL ORIENTATION

1. Divide the slide in half. Create the left ear sample by rolling the swab in two short horizontal parallel lines from the non-frosted edge to the middle of the slide (arrow shown).
2. Create the right ear sample by rolling the swab in two more short horizontal parallel lines starting from the middle of the slide to the frosted edge (arrow shown).



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Sample Preparation

See How to Impression Smear
Watch video for instructions on obtaining impression smears

Sample Prep Technique — Impression Smears

Step 1
Prepare the slides

1. After blotting off excess blood, gently touch/press the slide against the mass. This can be done a few times across the slide
2. Once the sample has been collected, allow the slide to dry to avoid heating artifacts

Step 2
Stain the slides

1. Once the slides are fully air-dried, stain the slides using a Romanowsky-type stain (e.g., Diff Quik™), closely adhering to the manufacturer's instructions for processing, and allow it to dry

Step 3
Add immersion oil and coverslip

1. After the slide has been stained and air-dried, place a drop of immersion oil on the smear
2. Place a 24 x 60 mm coverslip on the slide
3. The immersion oil will allow the coverslip to adhere to the slide
4. Now this sample is ready to be processed

Tips for Success

Do

- Always roll swabbed samples in one direction to avoid damaging the cells. This is crucial for inflammatory masses as rubbing the swab against the slide can distort cell samples
- Firm, consistent pressure will ensure a diagnostic layer is placed on the slide, while avoiding making the slide too thick

Do not

- Use excessive pressure when rolling the swab, especially when there is lots of exudate on the swab
- Heat fix when drying the slide
- Produce a thick sample

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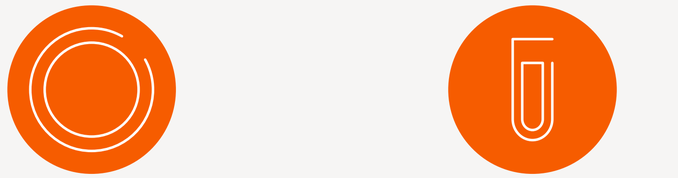
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Sample Preparation

Bone Marrow

Required Materials

__Figure 3.7__ Vetscan Imagyst Required Materials for Bone Marrow



Key Components

- ✓ Multiple slides (7-11) containing marrow

Sample Prep Technique — Bone Marrow

Step 1
Transfer marrow to Petri dish

1. Collect marrow in 2-3% EDTA-lined syringe
2. Transfer marrow to clean Petri dish
3. Tilt Petri dish to draw blood away from particles

Step 2
Select multiple particles

1. Use a microhematocrit tube or pipette to select a few particles
2. After collection, transfer particles onto a clean glass slide

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Sample Preparation

Sample Prep Technique — Bone Marrow (cont'd)

Step 3
Prepare slides

1. Place a clean glass slide over the slide containing the sample
2. Without applying pressure, pull the spreader slide across the sample slide horizontally
3. Allow sample to air dry
4. Now this sample is ready to be processed

Tips for Success

Do	Do not
The Petri dish should remain tilted during particle selection to minimize blood collection	Use excessive pressure on the spreader slide
Collect marrow in 2-3% EDTA. This is NOT a standard EDTA tube	Heat fix when drying the slide
If no anticoagulant is used, smears must be prepared within seconds after collection, because bone marrow clots rapidly. Smears prepared once clotting begins cannot be evaluated, because most of the nucleated cells will be lysed during smear preparation	
Collection into a syringe that contains EDTA as anticoagulant reduces the risk of clotting before a smear is prepared and allows time to prepare multiple smears that may be needed for special stains	
Prepare extra slides (6-10 total) so there are enough for resubmission if needed	

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Fluids

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Blood Smear

Required Materials

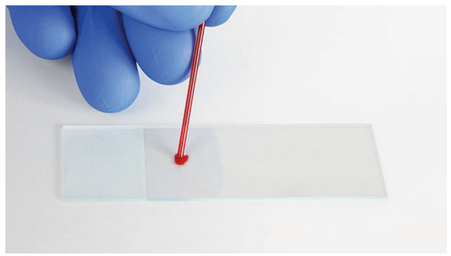
Figure 3.8 *Vetscan Imagyst Required Materials for Fluids*



Key Components

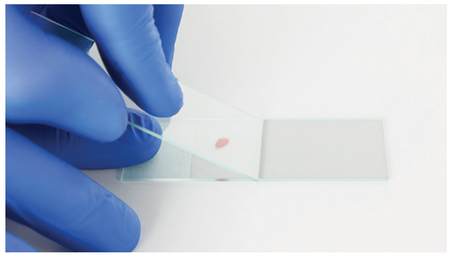
- ✓ Stained blood smear
- ✓ CBC data

Sample Prep Technique — Blood Smear



Step 1
Prepare the slide

1. Mix the EDTA anticoagulated blood
2. Use a microhematocrit capillary tube or precision pipette to draw blood from the tube that has just been mixed, and gently place a drop onto the labeled slide



Step 2
Place the spreader slide

1. Place the spreader slide on top of the labeled slide in front of the blood droplet and hold at a 30° to 45° angle

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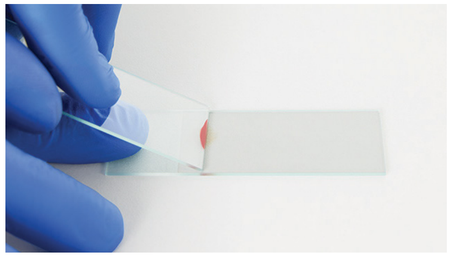
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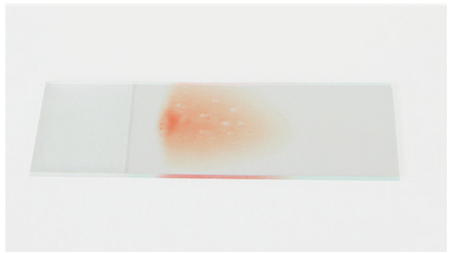
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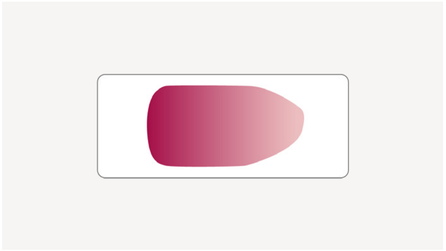
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Sample Preparation

Sample Prep Technique — Blood Smear (cont'd)









Step 3
Spread the blood

1. Draw the spreader slide back until it makes contact with the blood droplet
2. Capillary action will draw the sample toward the edges of the slide

Step 4
Complete the spread

1. Before the blood reaches the edges of the slide, with a smooth, stable and fluid motion, push the spreader slide away from the sample blood drop across the bottom slide
2. Maintain the same angle throughout the motion, and do not apply downward pressure. This should produce a uniform blood film covering approximately ½ to ⅔ of the slide

Step 5
Inspect the slide

1. After the blood smear is made, visually inspect the slide to ensure that ½ to ⅔ of the slide is covered (see pg. 30, "Common Errors in Blood Smear Slide Appearance" for additional guidance)
2. The smear should look like a thumbprint and exhibit a visible feathered edge at its end

Step 6
Stain the slide

1. Once the sample has fully air-dried, stain the slide using a Romanowsky-type stain (e.g., Diff Quik™), closely adhere to the manufacturer's instructions for processing:
   - Fixative
   - Red stain
   - Blue stain
   - Water rinse

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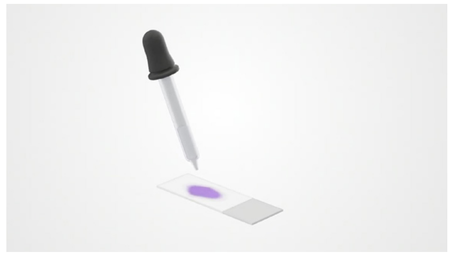
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Sample Prep Technique — Blood Smear (cont'd)



Step 7
Add immersion oil and coverslip

1. After the slide has been stained and air-dried, place a drop of immersion oil on the smear
2. Place a 24 x 60 mm coverslip on the slide
3. Now this sample is ready to be processed

Tips for Success

Do

- Use a 30° angle for most samples; 45° for anemic samples

Do not

- Tap capillary tube against the slide
- Apply too much pressure on the spreader slide
- Use too much blood
- Allow the blood to reach the edges of the slide
- Use a wooden stick for blood transfer in place of a capillary tube or pipette (platelets and white blood cells tend to adhere to the stick)
- Heat fix when drying the slide

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Sample Preparation

Common Errors in Blood Smear Slide Appearance[1]

Compare your blood smear with the following examples, which show how a blood smear should NOT look:



A Delay

- Time delay; the blood already began to dry



B Chipped

- Chipped or rough edge on spreader slide
- Do not lift the spreader slide before it reaches the end of slide



C Hesitation

- Hesitation in forward motion of slide



D Too quickly

- The smear is too short
- Spreader slide pushed too quickly



E Small blood drop

- Smear is too short or too thin
- Drop of blood is too small



F Spread

- Drop of blood not allowed to spread across the width of slide
- Start the spreader slide movement later during the capillary action of the blood



G Dirty slide

- Dirt/grease/fingerprint on the slide
- Make sure to use a clean slide



H Uneven pressure

- Uneven pressure on the spreader slide



Perfect slide

1. Slide is clean
2. Even pressure applied to the spreader slide
3. Uniform blood film that is not too thick or thin
4. All slide edges are smooth and there are no streaks

Reference: 1. Rodak BF, Fritsma GA, Keohane EM, Butina MM, Mirza KM, Walenga MW: *Rodak's Hematology, Clinical Principles and Applications*. ed 7, St. Louis, 2025, Elsevier. p 228.

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Sample Preparation

Body Cavity (pleural, peritoneal effusions)

Required Materials

Figure 3.9 *Vetscan Imagyst Digital Cytology Required Materials for Body Cavity (pleural, peritoneal, effusions)*



Pre-printed slide template

Refractometer

EDTA tube

Select CBC analyzers can be used to obtain a WBC count on the fluid if the fluid does not contain particulate material*

Key Components

- ✓ Stained direct (unconcentrated) preparation
- ✓ Stained sediment (concentrated) preparation
- ✓ Highly recommended for submission: total protein measurement and cell count

Total Protein Measurement

1. Use a refractometer to measure total protein
2. It is best to use the fluid supernatant for measurement, but the unspun fluid can be used for measurement if the fluid is clear

Cell Count

1. A CBC analyzer can be used to obtain a WBC count on the fluid if the fluid does not contain particulate material
2. Please see analyzer manufacturer's directions for fluid analysis

*The Vetscan® HM5 analyzer is validated for providing in-clinic nucleated cell counts† in alternative fluid samples for some species, including pleural and peritoneal fluids in dogs and synovial fluid in horses.[1‡] These cell counts can enable identification of inflammation, infections and neoplasia to characterize the effusion to aid in making a diagnosis.
†HM5 analyzers are not intended to provide accurate differential counts for alternative fluid analysis samples.
‡For results for species and/or fluids not validated, fluid samples may be run, however, precision and accuracy is not available and results will not be supported by Zoetis Diagnostics.

Reference: 1. Brudvig JM, Swenson CL. Total nucleated cell and leukocyte differential counts in canine pleural and peritoneal fluid and equine synovial fluid samples: comparison of automated and manual methods. Veterinary Clinical Pathology 2015;44:570–9. doi:10.1111/vcp.12298.

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Sample Preparation

Sample Prep Technique — Body Cavity (pleural, peritoneal effusions)

- Make sure it is clear which slide is the direct preparation and which slide is the sediment preparation prior to submission
- When you have fluid, always do a direct (unconcentrated) preparation first, followed by a sediment (concentrated) preparation if possible

Step 1
Collect fluid sample

1. Promptly place the fluid sample into an EDTA tube
2. If enough fluid remains, place a portion into a red top tube

Step 2
Direct (unconcentrated) preparation

1. Label the slide(s) with the patient name and sample source
2. If only a small amount of fluid is aspirated, transfer it directly onto the slide from the syringe
3. If fluid was placed into an EDTA tube, gently invert the tube of fluid several times to ensure it is well mixed
4. Place a drop of fluid near the label end of the slide and use the blood smear technique to spread the fluid, making sure to leave a feathered edge
5. Alternatively, if the sample is highly viscous, use the squash preparation technique. Place a second slide gently over the sample and without applying pressure, pull the two slides apart in a smooth horizontal motion
6. Rapidly dry the slide

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Sample Preparation

Sample Prep Technique — Body Cavity
(pleural, peritoneal effusions) (cont'd)

Step 3
Sediment (concentrated) preparation

1. Label the slide sediment with a pencil with the patient name and sample source
2. Aliquot a portion of well-mixed fluid into a separate tube for centrifugation
3. Spin down the fluid, decant the supernatant, and gently resuspend the pellet in the small amount of remaining fluid (similar to preparation of urine sediment)
4. Place a drop of the sediment near the label end of the slide and use the blood smear technique to spread the fluid, making sure to leave a feathered edge
5. Rapidly dry the slide
6. Once the slide has fully air dried, stain the slide using a Romanowsky-type stain (e.g., Diff Quik™), closely adhering to the manufacturer's instructions for processing, and allow it to dry
7. Place a drop of immersion oil on the slide
8. Place a 24 x 60 mm coverslip on the slide
9. Now this sample is ready to be processed

Tips for Success

Do

- Fluid in the EDTA tube should be used for slide preparation
- Fluid in the red top tube may be needed for additional testing

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Sample Preparation

Body Cavity (pericardial)

Required Materials

Figure 3.10 *Vetscan Imagyst Digital Cytology Required Materials for Body Cavity (pericardial)*



EDTA tube



Micropipette capable of 20µL sample



22-gauge needle

Key Components

- ✓ Stained direct (unconcentrated) preparation, similar to a blood smear

Sample Prep Technique

Step 1
Collect fluid sample

1. Promptly place the fluid sample into an EDTA tube

> **Note:** Pericardial fluid often has an appearance similar to peripheral blood. If the pericardial fluid sample obtained does not appear to be blood, please refer to **Body Cavity Fluids** (pleural, pertioneal effusions) for sample preparation recommendations.

Step 2
Prepare the slide

1. Mix the EDTA anticoagulated fluid
2. Use a microhematocrit capillary tube or precision pipette to draw fluid from the tube that has just been mixed, and gently place a drop onto the labeled slide

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Sample Prep Technique — Body Cavity (pericardial) (cont'd)

Step 3
Place spreader slide

1. Place the spreader slide on top of the labeled slide in front of the fluid droplet and hold at a 30° to 45° angle

Step 4
Spread the sample

1. Draw the spreader slide back until it makes contact with the fluid droplet
2. Capillary action will draw the sample toward the edges of the slide

Step 5
Complete the spread

1. Before the fluid reaches the edges of the slide, with a smooth, stable and fluid motion, push the spreader slide away from the sample fluid drop across the bottom slide
2. Maintain the same angle throughout the motion, and do not apply downward pressure
3. This should produce a uniform fluid film covering that is approximately ½ to ⅔ of the slide
4. Let the slide air-dry to avoid air-drying artifacts

Step 6
Inspect the slide

1. After the fluid smear is made, visually inspect the slide to ensure that ½ to ⅔ of the slide is covered
2. The smear should look like a thumbprint and exhibit a visible feathered edge at its end

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Sample Prep Technique — Body Cavity (pericardial) (cont'd)

Step 7
Stain the slide

1. Once the sample has fully air-dried, stain the slide using a Romanowsky-type stain (e.g., Diff Quik™), closely adhere to the manufacturer's instructions for processing

Step 8
Add immersion oil and coverslip

1. After the slide has been stained and air-dried, place a drop of immersion oil on the smear
2. Place a 24 x 60 mm coverslip on the slide
3. The immersion oil will allow the coverslip to adhere to the slide
4. Now this sample is ready to be processed

Tips for Success

Do

- Pericardial fluid often has an appearance similar to peripheral blood. If the pericardial fluid sample obtained does not appear to be blood, please refer to pg. 31, Body Cavity (pleural, peritoneal effusions) for sample preparation recommendations

Do not

- Tap capillary tube against the slide
- Allow the fluid to reach the edges of the slide
- Use a wooden stick for fluid transfer in place of a capillary tube or pipette (platelets and white blood cells tend to adhere to the stick)
- Heat fix when drying the slide

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Sample Preparation

Cerebrospinal Fluid (CSF)

Note: Requires special handling. CSFs will not be accepted without both key components.

Required Materials

Figure 3.11 *Vetscan Imagyst Digital Cytology Required Materials for Cerebrospinal Fluid (CSF)*



EDTA tube



Red top tube



Cytocentrifuge (or “cytospin”)



Pipette

Key Components

- ✓ Cytocentrifuge/cytospin preparation
- ✓ Hemacytometer cell count (performed manually by a trained individual)

A cytocentrifuge (or “cytospin”) is a specialized centrifuge that is used in the reference lab setting to concentrate very low cellularity fluids, such as CSF or washes, onto a small circular area of the slide. This preparation technique helps to preserve cell integrity and ensure there are cells available for evaluation by the pathologist.

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Sample Prep Technique — Cerebrospinal Fluid (CSF)

Step 1
Collect fluid sample

1. Promptly aliquot CSF sample into an EDTA tube and into a red top tube if enough fluid is available

Step 2
Cytocentrifuge preparation

1. Label the slide “CSF + patient name” with a pencil
2. Prepare the funnel, slide, and clip apparatus according to the cytocentrifuge manufacturer’s instructions
3. Carefully pipette 200 uL of CSF into the funnel (minimum 100 uL)
4. Centrifuge the sample according to the manufacturer’s instructions
5. Remove the slide from the centrifuge and unclip from the funnel apparatus
6. Using a slide marking pen, or a pre-printed slide template, draw a circle on the underside of the slide surrounding the sample area. This step will ensure the area of interest can be easily visualized and included in the scanned field

Step 3
Stain the slide

1. Once the slide is fully air-dried, stain the slide using a Romanowsky-type stain (e.g., Diff Quik™), closely adhering to the manufacturer’s instructions for processing, and allow it to dry

Step 4
Add immersion oil and coverslip

1. After the slide has been stained and air-dried, place a drop of immersion oil on the smear
2. Place a 24 x 60 mm coverslip on the slide
3. The immersion oil will allow the coverslip to adhere to the slide
4. Now this sample is ready to be processed

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Tips for Success

Do

- Send CSF samples to a reference laboratory if hemacytometer cell count and cytocentrifuge preparations are not available
- Prior to submission, include: relevant patient history, description of fluid, hemacytometer manual cell counts (RBC and WBC), and cytocentrifuge slide

Do not

- Draw on the sample side of the slide with the slide marking pen. Even concentrated CSF samples can be of very low cellularity and difficult to visualize on the slide once stained
- Heat fix when drying the slide

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Sample Preparation

Washes (TTW, BAL, nasal flush, urinary tract wash)

Required Materials

Figure 3.12 *Vetscan Imagyst Digital Cytology Required Materials for Washes (TTW, BAL, nasal flush, urinary tract wash)*



EDTA tube



Sterile tube



Cytocentrifuge/cytospin
(highly recommended if available)

Key Components

- ✓ Stained direct (unconcentrated) preparation
- ✓ Stained sediment (concentrated) preparation

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Sample Preparation

Sample Prep Technique — Washes (TTW, BAL, nasal flush, urinary tract wash)

Note: always do a direct (unconcentrated) preparation first, followed by a sediment (concentrated) preparation if possible.

Step 1
Collect fluid sample

1. Promptly place the fluid sample into an EDTA tube
2. If enough fluid remains, place a portion into a red top tube

Step 2
Direct (unconcentrated) preparation

1. Label the slide directly with a pencil with the patient name and sample source
2. Gently invert the tube of EDTA fluid several times to ensure it is well mixed
3. Place a drop of fluid near the label end of the slide and use the blood smear technique to spread the fluid, making sure to leave a feathered edge
4. Rapidly dry the slide
5. Once the slide is fully air-dried, stain the slide and allow to dry

Step 3
Sediment (concentrated) preparation

1. Label the slide sediment with a pencil with the patient name and sample source
2. Aliquot a portion of well-mixed fluid into a separate tube for centrifugation
3. Spin down the fluid, decant the supernatant, and gently resuspend the pellet in the small amount of remaining fluid (similar to preparation of urine sediment)
4. Place a drop of the sediment near the label end of the slide and use the blood smear technique to spread the fluid, making sure to leave a feathered edge
5. Rapidly dry the slide
6. Once the slide is fully air-dried, stain the slide and allow to dry

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Sample Preparation

Tips for Success

Do

- Fluid in the EDTA tube should be used for slide preparation
- Fluid in the sterile tube may be needed for additional testing, such as culture
- Make sure it is clear which slide is the direct preparation and which slide is the sediment preparation

Do not

- Heat fix when drying the slide

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Sample Preparation

Synovial/Joint

Required Materials

Figure 3.13 *Vetscan Imagyst Required Materials for Synovial/Joint*



1” 20-22 gauge needle



2 to 5 mL syringe



EDTA tube

Key Components

- ✓ Stained direct (unconcentrated)
- ✓ Highly recommended for submission — note the visual fluid parameters:
  - What is the color of the sample? Is it straw/yellow or blood contaminated?
  - What is the clarity of the sample? Is it clear or cloudy?
  - What is the viscosity of the sample? Is it stringy and viscous or watery?

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Sample Preparation

Sample Prep Technique — Synovial/Joint

Always do a direct (unconcentrated) preparation first, followed by a sediment (concentrated) preparation if possible.

Step 1
Collect fluid sample

1. If only a small amount of fluid is collected, slides may be made directly from a needle/syringe
2. Otherwise, place an aliquot of fluid in an EDTA
3. If enough fluid remains, place a portion into a sterile tube without additive in case culture is needed

Step 2
Direct (unconcentrated) preparation

1. Label the slide(s) with the patient name and sample source
2. If only a small amount of fluid is aspirated, transfer it directly onto the slide from the syringe
3. If fluid was placed into an EDTA tube, gently invert the tube of fluid several times to ensure it is well mixed
4. Place a drop of fluid near the label end of the slide and use the blood smear technique to spread the fluid, making sure to leave a feathered edge
5. Alternatively, if the sample is highly viscous, use the squash preparation technique. Place a second slide gently over the sample and without applying pressure, pull the two slides apart in a smooth horizontal motion
6. Rapidly dry the slide

Step 3
Stain the slide

1. Once the slide is fully air-dried, stain the slide and allow to dry using a Romanowsky-type stain (e.g., Diff Quik™), closely adhering to the manufacturer's instructions for processing, and allow it to dry

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Sample Prep Technique — Synovial/Joint (cont'd)

Step 4
Add immersion oil and coverslip

1. After the slide has been stained and air-dried, place a drop of immersion oil on the smear
2. Place a 24 x 60 mm coverslip on the slide
3. The immersion oil will allow the coverslip to adhere to the slide
4. Now this sample is ready to be processed

Tips for Success

Do	Do not
If only a small amount of fluid is collected during sample collection, slides may be made directly from a needle/syringe. Otherwise, place an aliquot of fluid in an EDTA tube and mix well	Heat fix when drying the slide

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Sample Preparation

Urine Sediment

Required Materials

Figure 3.14 *Vetscan Imagyst Digital Cytology Required Materials for Urine Sediment*

Clean, clear, sterile container for urine sample

Plastic pipettes



Vetscan Imagyst urine sample prep device (consisting of XactUrine® urine centrifugation tube with graduated 1-, 2- and 3-mL fill lines and XactUrine® pipette tip with stopper, all included in the Vetscan Imagyst AI Urine Sediment Sample Kit)

Centrifuge capable of 450-500 RCF X 2 min

Micropipette capable of 20µL sample

Key Components

- ✓ Air-dried urine sediment smear/concentrated preparation (Diff Quik™ or similar)
- ✓ Wet prep/unstained: accepted as Add-On Expert Review following AI Urine Sediment evaluation

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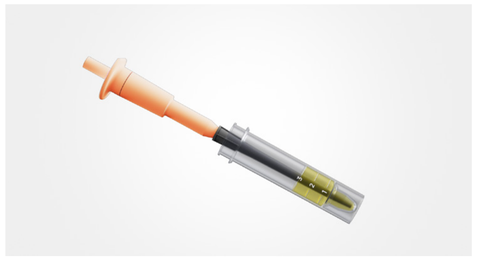
Sample Preparation

Sample Prep Technique — Urine Sediment



Step 1
Centrifuge the sample

1. Determine if dilution may be necessary*
2. Mix the sample well
3. Transfer 1, 2, or 3 mLs to the centrifugation tube
4. Centrifuge with a corresponding tube for balance for 2 minutes at 450–500RCF
5. Allow to come to a complete stop



Step 2
Prepare the sample

1. Attach the XactUrine pipette tip to the micropipette
2. Place the pipette with tip attached in the tube
3. Tilt the tube to pour off the supernatant until no liquid is visualized above the stopper
4. Return the tube to vertical
5. Depress the plunger to expel any air from the micropipette
6. Keeping the plunger depressed, reseat the micropipette in the lower portion of the tube, and resuspend the remaining pellet by pressing and releasing the micropipette plunger until well-mixed



Step 3
Prepare slide (wet prep)

1. Place a pre-printed slide on the template
2. Orient the fiducial circle toward the bottom of template
3. Label the slide with patient name and sample source on the frosted edge
4. Once pellet is resuspended, place 20µl in the fiducial circle
5. Place the edge of a square coverslip on the slide and lay it gently over the sample, avoiding the formation of air bubbles
6. Now this sample is ready to be processed

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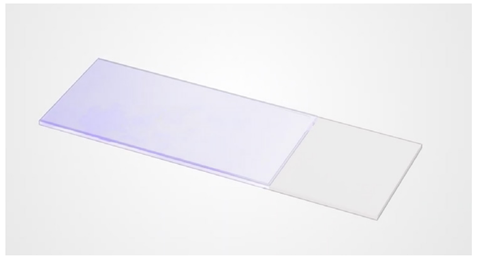
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Sample Preparation

Sample Prep Technique — Urine Sediment (cont'd)



Step 4
Prepare stained slide (dry prep)†

1. Mix the remaining urine sediment well
2. Use one drop to create smear or line-prep
3. Allow to air-dry completely
4. Once the slide is fully air-dried, stain the slide using a Romanowsky-type stain (e.g., Diff Quik™)
5. Allow to air-dry
6. Add one drop of immersion oil
7. Place a 24 x 60 mm coverslip on the slide
8. Now this sample is ready to be processed

Tips for Success

Do

- Mix sample well prior to placing an aliquot into the urine centrifugation tube
- Ensure only one pre-printed slide is used and the fiducial circle is face up
- Ensure only one coverslip is placed on sample
- Follow Vetscan Imagyst maintenance guide for regular cleaning

Do not

- Use more than 20µL of sample, as increased volume can spill over the sides of the slide onto scanner stage
- Heat fix when drying the slide
- Allow air bubbles to group around the center fiducial, as this can cause scanner difficulty in focusing on the sample

*It is important to evaluate the color and clarity of the urine sample using a clear specimen container to determine if dilution is necessary. Refer to the Dilution Guide.
†It is strongly recommended that you prepare an additional stained urine sediment slide for analysis. While a review of the wet mount may be preferred for questions surrounding crystals or casts, a stained, air-dried slide is essential for review of bacteria and cellular morphology.

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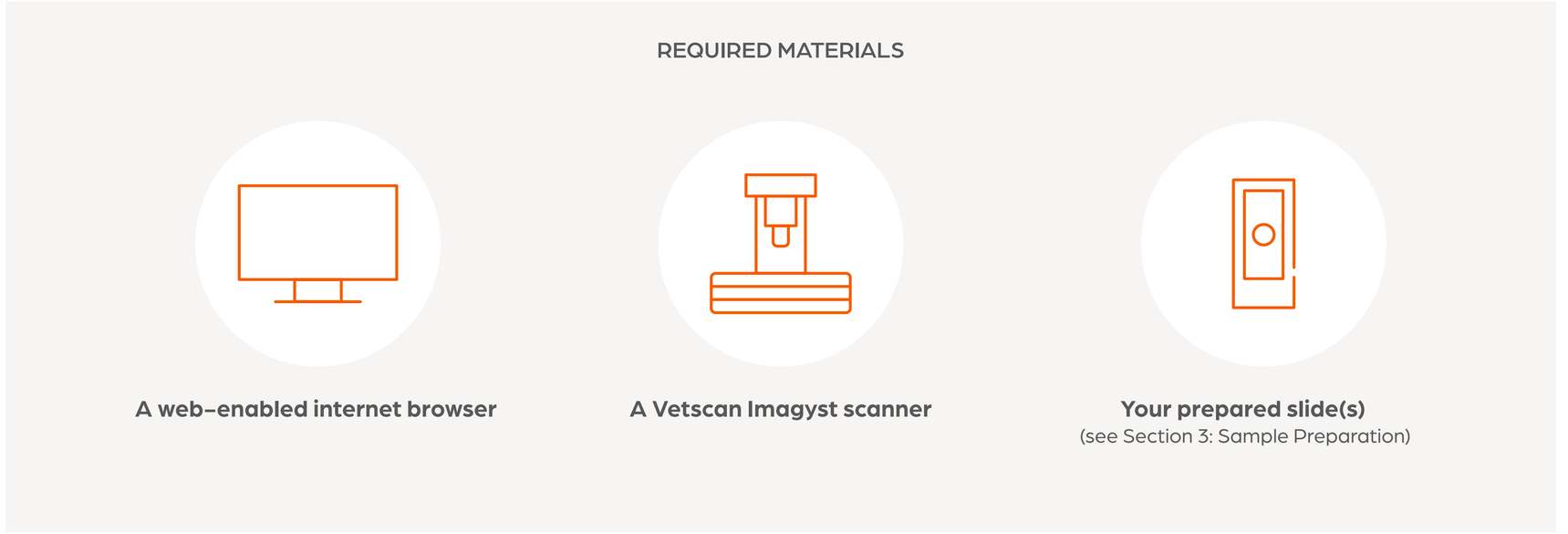
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Using the Vetscan Imagyst for Digital Cytology

How to Run a Digital Cytology Analysis

Figure 4.0 *Vetscan Imagyst Required Materials for Running a Digital Cytology Analysis*



Best Practices

It's important to follow protocols and instructions carefully when using Vetscan Imagyst for accurate testing. Here are some general best practices to follow:

- ✓ Properly prepare your cytology slides using the required collection, handling, staining and coverslipping procedures (see Section 3)
- ✓ Place the slide correctly on the scanner with the sample side up and label facing right
- ✓ Ensure the slide is fully within the scanning area
- ✓ Keep the scanner clean (see Section 8)
- ✓ Check for any obstructions near the scanner that might impede movement
- ✓ Follow the recommended workflow for scanning and submitting digital slides through the Vetscan Imagyst platform
- ✓ Ensure there is no immersion oil on top of the coverslip and use only enough to cover the sample, as excess oil can contaminate the scanner lens

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Vetscan Imagyst Workflow: How–To Guide

Step 1
Order the test

1. Make sure your scanner is connected to the network and has been powered on
2. Open your practice information management software and locate the patient's chart and medical record
3. Enter the treatment code for the test you are performing. If your software is connected to the Vetscan Hub™*, you can order the test from there
4. Open the treatment list and select the test type from the list of available tests and click **Done**
5. Log into Vetscan Imagyst and select **Start** for the correct sample. The sample information, patient name and patient ID will come pre-populated on the screen

> If your clinic does not have connectivity enabled, the test can be initiated directly on the Imagyst platform: select the **Add new test** icon, then enter the patient ID, name and species in the **Add test** window and select **Create**.

Step 2
Complete the patient history

1. Enter the site name, preparation time and body region

Step 3
Add sample sites (you may create up to two sample sites)

1. Click on either **Add fluid** or **Add mass**
2. Complete the required information fields (such as body region) and click **Create**. This information will populate on your report and enable further diagnostic testing decisions
   - To open and edit a sample site, select a **Sample card**
   - To remove a sample site, open a sample site card and select **Delete**

*Vetscan Hub is an all-in-one intuitive platform that allows you to synchronize your in-clinic diagnostics with select PIMS software on a single screen, for a seamless workflow, comprehensive insights and enhanced patient care. Tests ordered in your PIMS appear instantly on the Vetscan Hub, which then displays the results and shares them back to your PIMS. The Vetscan Hub also connects your in-clinic workflow to the Virtual Laboratory ecosystem through ZoetisDx.com.

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Vetscan Imagyst Workflow: How–To Guide (cont'd)

Step 4
Select the scanner

1. Once you have entered all the information, select **Add a Scan** to open the scan window
2. When the scan window opens, select a scanner
3. If the tray is closed, click **Open Tray**
4. Unlock the slide holder

Step 5
Load and scan the prepared slide, and submit the order

1. With the slide locking mechanism open, place the slide on the scanner sample side up, with the sample on your left and the frosted edge to your right
2. Close the locking mechanism
3. Return to the Vetscan Imagyst on your laptop, tablet or mobile device and click the **Preview** button
4. When the preview appears, review the suggested scan area and estimated time to scan. If both are acceptable, click **Continue** and the scanner will begin scanning
5. When you've completed scanning all slides, click the **Close** button
6. Prior to submitting the order, you can attach additional files that the pathologist might find useful. Click **Attach Files** and upload any JPEG or PDF files, including any available patient reports
7. When those files have been uploaded, click **Close**
8. Click **Submit Order**. Your test order has now been submitted

An incomplete or unsubmitted test will display with an **Incomplete Test Order** status in the inbox.
Select **Open** to complete all required fields and review steps 2–5.

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Vetscan Imagyst Workflow: How–To Guide (cont'd)

Step 6
Find and review the report

1. Navigate to the inbox. You will see four tabs at the top of the inbox. The first tab is **Pending Orders** where you can find the test status
2. Your test order will show in the **Pending Order** tab while it's out for review as either **Waiting for Assignment** or **Assigned to Pathologist**
3. The report will be available in the **Ready for Review** tab after the clinical pathologist finishes their review
4. Find your specific test order and click the **Review** button to open the report in the report viewer
5. To share the report for viewing within the Vetscan Imagyst, click the **Share** button to bring up a link
6. Anyone can review the results within Vetscan Imagyst with the shareable PDF report

Step 7
Finalize the report

The report is available in the Vetscan Hub™ and the ZoetisDx portal where it can be seen with other diagnostic results.

1. After you review the report, click **Acknowledge** which indicates that you have seen the report and moves it from the **Ready for Review** tab to the **Test History** tab
2. Once the results have transferred over, the report can be accessed and viewed within the Vetscan Hub™ with other diagnostic results
3. Finally, the report is sent to your patient information management system software. This completes the test order

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Tips for Success

Do

- Before scanning, verify that:
  1. The slide is facing the right direction and is aligned properly
  2. The slide is not upside down
  3. Only one coverslip is used
- Scan the slide as soon as possible after sample preparation
- Ensure the slide lock is engaged

Do not

- Operate centrifuges near the Vetscan Imagyst during scanning
- Keep objects that may impede movement near the scanner

Vetscan Imagyst digital cytology workflow:

CYTOPATHOLOGY RESULTS WITHIN HOURS OR NEXT DAY[1]



Collect Sample and Prepare Slide

Scan
Confirmation of image upload within minutes

Expert review and result reporting

Know

Reference: 1. Data on file, Study No. TI-11711, 2024, Zoetis Inc.

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Sample Digital Cytology Report

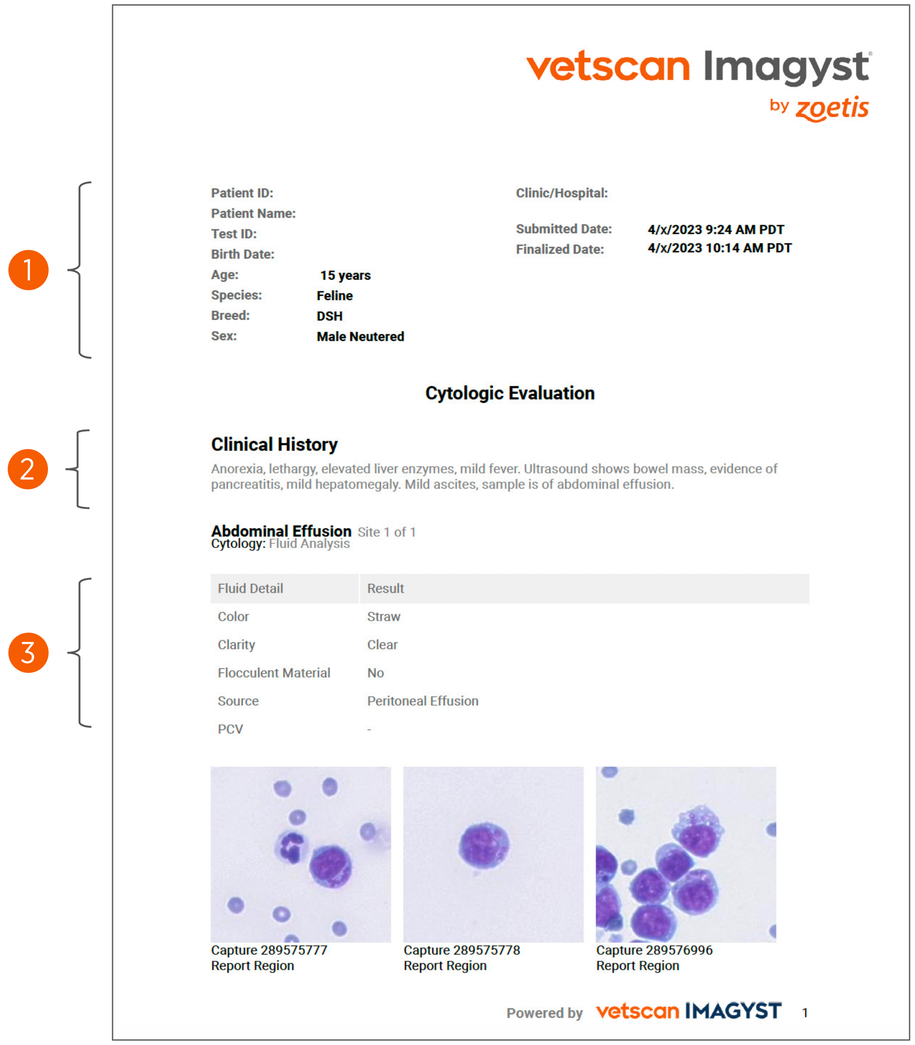
Vetscan Imagyst provides comprehensive reports designed to be shareable with clients for visibility, which can help inform and educate clients, improve communication and build trust. Seeing detailed images of their pet's cells can help make the diagnosis easier to understand for your clients, and may allow for greater involvement in their pet's treatment, potentially reducing anxiety and frustration.

The following Vetscan Imagyst Digital Cytology sample report features an analysis of peritoneal fluid in a male cat, age 15.

Page 1 features:

1. Patient information
2. Clinical history as entered by you during Step 2 of the workflow
3. Description of the sample type and site

Figure 4.1 *Vetscan Imagyst Sample Digital Cytology Report*



vetscan Imagyst by zoetis

Patient ID:
Patient Name:
Test ID:
Birth Date:
Age: 15 years
Species: Feline
Breed: DSH
Sex: Male Neutered

Clinic/Hospital:

Submitted Date: 4/x/2023 9:24 AM PDT
Finalized Date: 4/x/2023 10:14 AM PDT

Cytologic Evaluation

Clinical History

Anorexia, lethargy, elevated liver enzymes, mild fever. Ultrasound shows bowel mass, evidence of pancreatitis, mild hepatomegaly. Mild ascites, sample is of abdominal effusion.

Abdominal Effusion Site 1 of 1
Cytology: Fluid Analysis

Fluid Detail	Result
Color	Straw
Clarity	Clear
Flocculent Material	No
Source	Peritoneal Effusion
PCV	-

Capture 289575777 Report Region
Capture 289575778 Report Region
Capture 289576996 Report Region

Powered by vetscan IMAGYST 1

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Sample Digital Cytology Report (cont'd)

Pages 1–2 features:

1. High-definition scan images
   - Pet owner focus groups found 100% preference for visual results reports[1]
   - Vetscan Imagyst Digital Cytology reports contain clear, vivid, high-definition scan images that can help inform and educate clients
   - The ability to show clients detailed imagery within a customer-facing report provides a tangible anchor when sharing results and can help aid client communication
   - Seeing what you see can also help clients to better understand the diagnosis and recommended treatment protocol
2. A detailed microscopic description of the scans
3. The expert clinical pathologist's interpretation (in this case, granular lymphoma)
4. Comments from the expert clinical pathologist
5. Should you have questions or require additional information beyond the report, you have the option to contact the clinical pathologist directly for every case

Figure 4.2 *Vetscan Imagyst Sample Digital Cytology Report (cont'd)*



Reference: 1. Janke N, Coe JB, Bernardo TM, Dewey CE, Stone EA. Use of health parameter trends to communicate pet health information in companion animal practice: A mixed methods analysis. Vet Rec. 2022;190(7):e1378. doi:10.1002/vetr.1378.

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What Is Vetscan Imagyst AI Masses?

Vetscan Imagyst AI Masses is the latest application for the innovative, multi-use Vetscan Imagyst platform and provides a new entry point to experience the benefits of the Zoetis Virtual Laboratory. AI Masses can help you to rapidly identify, count, and analyze cell populations suggestive of pathology in common lymph node and skin/subcutaneous masses at the point-of-care, powered by deep-learning AI and supported by add-on remote expert clinical pathology review when clinically warranted†.

What Is New and Different About AI Masses?

Fast answers, less wait time for concerned pet parents

AI Masses completes our comprehensive cytology offering on the Vetscan Imagyst, providing fast AI-powered cytologic analysis at the point-of-care for more insights, which can help increase accessibility to testing and reduce worry associated with wait time. It can help you provide quick answers to your clients' pressing concerns on a timeline that works for you.

Key Features

- ✓ Best-in-class* AI technology, trained by expert clinical pathologists, for results within minutes
- ✓ Fast results can help minimize client anxiety of waiting for answers
- ✓ AI algorithm performs comparable to expert clinical pathologists' consensus[1,2] at the point-of-care
- ✓ Familiar one-time sample preparation without changing your workflow
- ✓ Clear, detailed reports with images that can help inform diagnostic and treatment decisions
- ✓ Part of the unique, multi-use Vetscan Imagyst platform and our complete cytology solution
- ✓ Small footprint and compact design, plus multiple indications, representing a huge space-saving opportunity for vet clinics

How Is AI Masses Different From Digital Cytology?

Both Vetscan Imagyst AI Masses and Digital Cytology can help you provide fast answers and reduce the client's anxiety of waiting.

AI Masses

Screen lymph node and skin/subcutaneous samples for common lesions in clinic, which can help enable fast results within minutes, with the option to request Add-on Expert Clinical Pathologist Review when clinically warranted.†

Digital Cytology

Send samples digitally to board-certified clinical pathologists for review without needing to read your own slides, with flexible reporting options and results available on your timeline.

*Vetscan Imagyst is the only commercial AI analyzer available on the market offering six testing capabilities.
†Additional costs may apply.
References: 1. Data on file, Study No. DHXMZ-US-25-285, 2025, Zoetis Inc. **2.** Data on file, Study No. DHXMZ-US-25-286, 2025, Zoetis Inc.

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What Is Vetscan Imagyst AI Masses?

How AI Masses Works

- Slide preparation for AI Masses follows the same procedure as Digital Cytology: prepare the sample using a fine needle aspirate (FNA) or fine needle biopsy (FNB) technique including staining, following industry best practices (see Section 3: Sample Preparation for Vetscan Imagyst AI Masses and Digital Cytology).
- Select a slide for testing that has the most blue stain uptake macroscopically.

Note: Only 1 slide is able to be scanned.

- The selected slide is then scanned on the Vetscan Imagyst microscope scanner.
- Results are available through the Vetscan Imagyst Platform application and the ZoetisDx portal, synced to the PIMS via the Vetscan Hub™ or Vetscan® Fuse.
- You may add comments and select high-definition scan areas.
- For all AI Masses results, Add-on Expert Review is always available when clinically warranted.*

Note: For detailed instructions on the AI Masses workflow, see Section 6: How to Run a Vetscan Imagyst AI Masses Analysis.

When to Use AI Masses:

Do Use

- ✓ To screen for common skin/subcutaneous masses from analysis of a sample
- ✓ To screen for common lymph node lesions from analysis of a sample
- ✓ On dogs and cats

Do not use

- ✗ On fluid analyses
- ✗ On organ aspirates
- ✗ On species other than dogs or cats

*Additional costs may apply.

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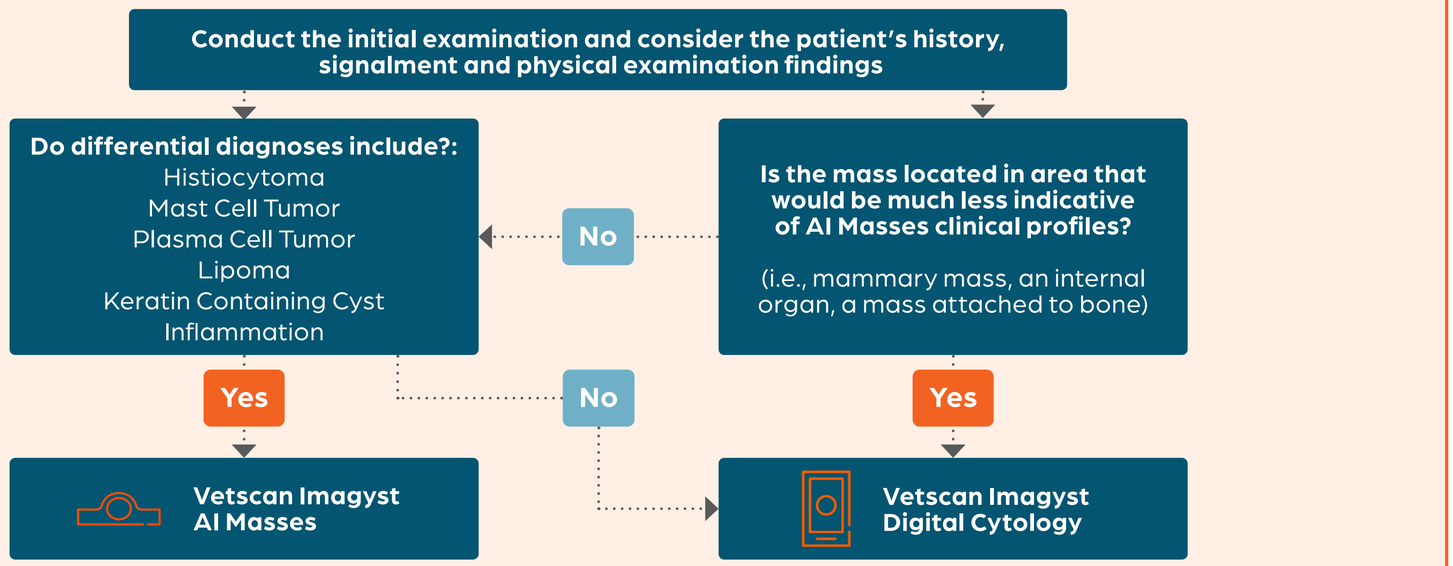
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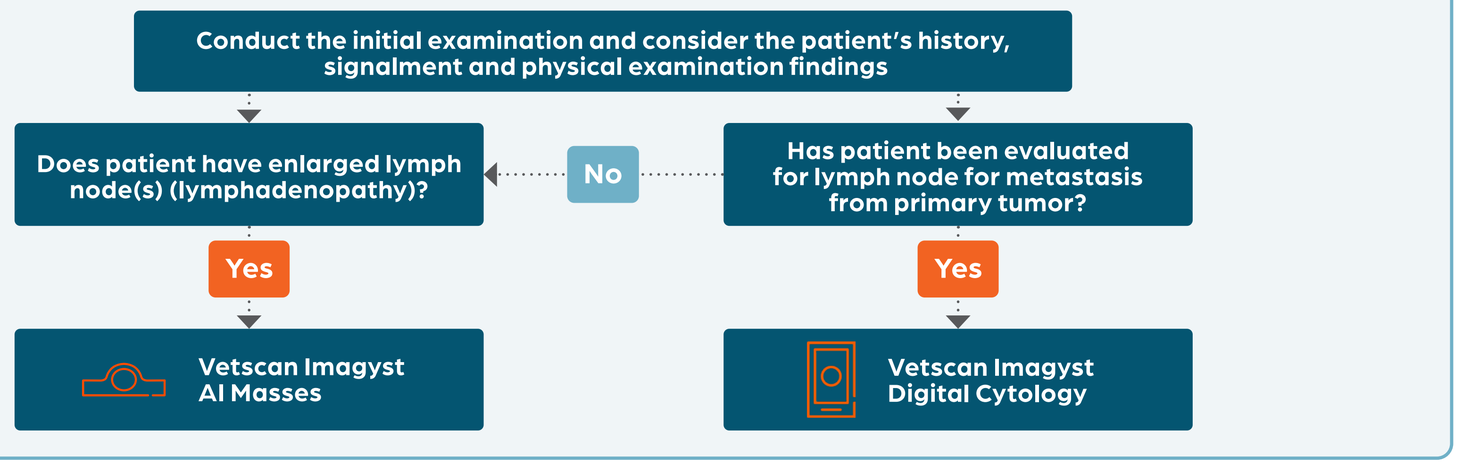
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Choosing the Right Patients for AI Masses

Skin/Subcutaneous Masses



Lymph Nodes



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What Is Vetscan Imagyst AI Masses?

AI Masses Identifies Findings Suggestive Of:

Lymph Node Clinical Profiles
Reactive lymphoid hyperplasia
Lymph node with inflammation
Neoplasia (Large cell lymphoma)
Not lymph node (salivary and adipose tissue)

Skin/subcutaneous Mass Clinical Profiles
Histiocytoma
Mast cell tumor
Plasma cell tumor
Lipoma/adipose tissue
Keratin containing lesion
Inflammation (Inflammatory lesion)*

Additional diagnostic categories not listed above might result in indeterminate results, which do not fit into a clinical profile. In this case, Add–on Expert Review† is always recommended. See pg. 76 for more info.

*Look at microscopic findings to classify information.
†Additional costs may apply.

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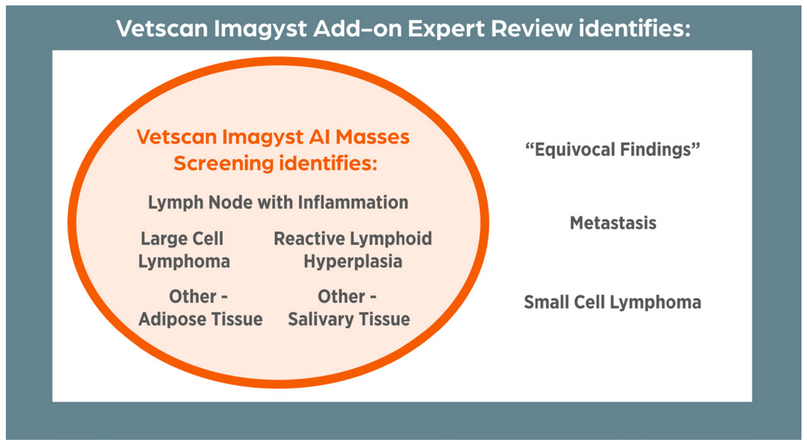
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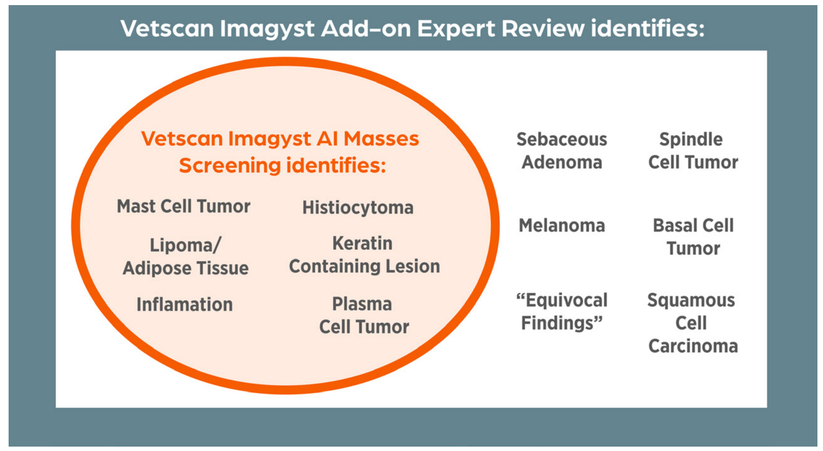
What Is Vetscan Imagyst AI Masses?

AI Masses screens for cells suggestive of pathology in common lymph node and skin/subcutaneous masses, with the support of Add-on Expert Review* when clinically warranted.

Screening Lymph Nodes



Screening Skin/subcutaneous Masses



Interpretation Atlas

Reviewing Results

All AI Masses results and images should be reviewed in conjunction with the patient clinical history and physical examination. Refer to this guide for additional diagnostic direction after the AI algorithm has classified the sample, and consult the reference guides below for specific clinical profiles and possible next steps.

> **Note:** The AI Masses report will always read "Finding Suggestive of Clinical Profile". If the results are indeterminate, the results will say "Indeterminate Results — the findings do not match any established diagnostic categories" (see Indeterminate Results section, pg. 76).

*Additional costs may apply.

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Lymph Node Aspirate Clinical Reference Guide

Why Aspirate a Lymph Node?

Enlarged lymph nodes are a clinical concern due to the wide range of potential underlying pathologies.[1,2] Differential diagnoses for lymphadenopathy include neoplastic, infectious and immunologic conditions, among others.[2] Cytological evaluation of lymph nodes provides valuable insight into the underlying cause, helping clinicians determine the appropriate course of action.[2]

Lymph Node Aspirate Clinical Profiles†

Note: The following potential clinical next step applies to all lymph node aspirate clinical profiles, including Indeterminate Results:

– For questions regarding case management and treatment, please consult the Zoetis Diagnostics Virtual Laboratory Expert Clinical Consultation Service.

Lymph Node Clinical Profiles
Reactive lymphoid hyperplasia
Lymph node with inflammation
Neoplasia (Large cell lymphoma)
Not lymph node (salivary and adipose tissue)

†Additional clinical profiles not listed here may fall under "indeterminate results". See Indeterminate Results, Table 5.3, pg. 76-77, for more information.

References: 1. Blauvelt M and Messick JB. Chapter 11 The Lymph Nodes. In: Cowell RL, Tyler RD, Meinkoth JH, DeNicola DB. *Cowell and Tyler's Diagnostic Cytology and Hematology of the Dog and Cat*. 5th ed. Elsevier; 2020. Pgs. 174-175. **2.** Takuo Ishida. Chapter 95 *Lymph Node Aspiration and Biopsy*. In: Ettinger SJ, Feldman EC, Côté E, eds. *Textbook of Veterinary Internal Medicine*. 8th ed. Elsevier; 2017. Pgs. 366-369.

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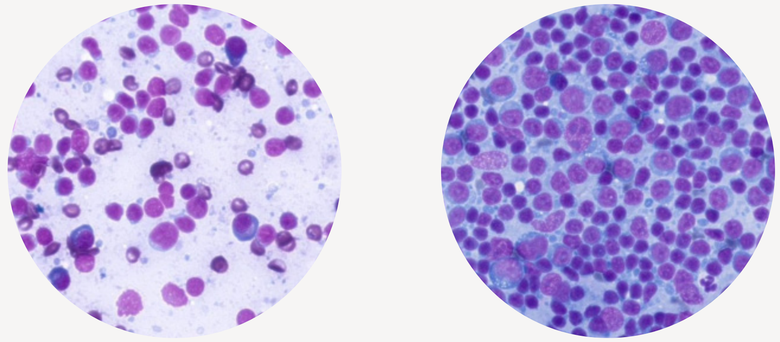
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What Is Vetscan Imagyst AI Masses?

Findings Suggestive of Reactive Lymphoid Hyperplasia



Images obtained by the Vetscan Imagyst at 40x magnification.

Additional Clinical Information

The cytological appearance of the sample is consistent with reactive lymphoid hyperplasia (RLH), a benign proliferation of lymphoid tissue (increase in intermediate and large lymphocytes) in response to antigenic stimulation.[1,2] Small lymphocytes are still the predominant cell type in these cases and plasma cells may be present (reported in the Microscopic Findings of the AI Masses Report).[1]

This condition is likely to occur due to an infection, autoimmune conditions or neoplasia.[2] In some instances, antigens can also attract inflammatory cells to the lymph node resulting in concurrent inflammation.[1]

Potential Next Clinical Steps:

- Examination of additional slides or biopsy and histologic evaluation may be necessary to confirm hyperplasia vs. neoplasia.[2]
- Clinical management involves identifying and treating the underlying cause while providing supportive care.
- Add-on Expert Review is available for confirmation or if clinically warranted. Additional costs may apply.

References: 1. Blauvelt M and Messick JB. Chapter 11 The Lymph Nodes. In: Cowell RL, Tyler RD, Meinkoth JH, DeNicola DB. *Cowell and Tyler's Diagnostic Cytology and Hematology of the Dog and Cat.* 5th ed. Elsevier; 2020. Pgs. 174-175. **2.** Takuo Ishida. Chapter 95 *Lymph Node Aspiration and Biopsy.* In: Ettinger SJ, Feldman EC, Côté E, eds. *Textbook of Veterinary Internal Medicine.* 8th ed. Elsevier; 2017. Pgs. 366-369.

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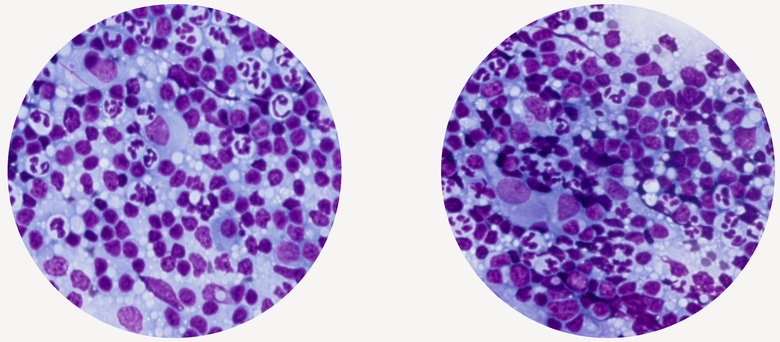
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Findings Suggestive of Lymph Node with Inflammation



Images obtained by the Vetscan Imagyst at 40x magnification.

Additional Clinical Information

The cytological appearance of the sample is consistent with lymph node with inflammation. Inflammation of lymph node may be a primary or secondary process.[1] Characterization of the inflammation can be determined by looking at the inflammatory cells present in the sample[1] (neutrophils and eosinophils reported in the Microscopic Findings of AI Masses Report).

A neutrophilic response can be elicited by a bacterial infection within the node or perhaps from draining in the area.[2] An eosinophilic response is common in lymph nodes draining regional areas of allergic inflammation of the skin or respiratory tract.[1]

Potential Next Clinical Steps:

- Clinical management involves identifying and treating the underlying cause while providing supportive care.
- Add-on Expert Review is available for confirmation or if clinically warranted. Additional costs may apply.

References: 1. Blauvelt M and Messick JB. Chapter 11 The Lymph Nodes. In: Cowell RL, Tyler RD, Meinkoth JH, DeNicola DB. *Cowell and Tyler's Diagnostic Cytology and Hematology of the Dog and Cat.* 5th ed. Elsevier; 2020. Pgs. 174-175. **2.** Takuo Ishida. Chapter 95 *Lymph Node Aspiration and Biopsy.* In: Ettinger SJ, Feldman EC, Côté E, eds. *Textbook of Veterinary Internal Medicine.* 8th ed. Elsevier; 2017. Pgs. 366-369.

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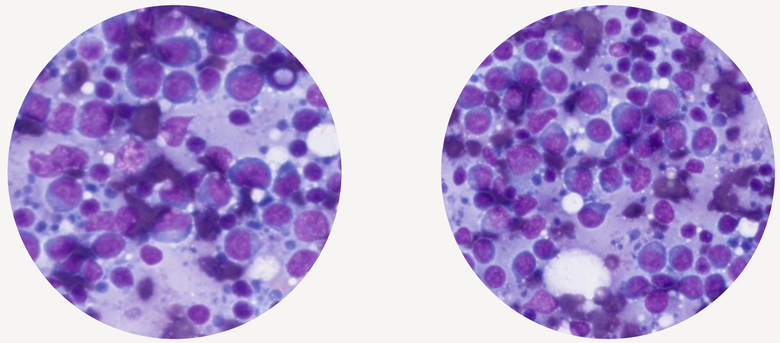
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What Is Vetscan Imagyst AI Masses?

Findings Suggestive of Neoplasia (Large cell lymphoma)



Images obtained by the Vetscan Imagyst at 40x magnification.

Additional Clinical Information

The cytological appearance of the sample is consistent with large cell lymphoma. Lymphoma develops when a monoclonal population of lymphoid cells proliferates, lacking the diverse mixture of cell types typically seen in a reactive immune response.[1] Large cell lymphoma is characterized by the presence of large lymphocytes with prominent nuclei and mitotic activity.[1,2] Clinical presentation may include lymphadenopathy, lethargy, weight loss or organ involvement depending on the subtype and disease progression.[3]

Potential Next Clinical Steps:

- Ancillary testing such as biopsy with histopathologic evaluation and immunohistochemical staining, PCR for antigen receptor rearrangement (PARR, which can be performed on these aspirates), and/or flow cytometry (requires new aspirates collected into a fluid medium) is strongly encouraged, allowing for further classification of the lymphoma type to aid in prognosis and treatment considerations.[4]
- For patients suspected to have lymphoma, the diagnostic evaluation should include, but not be limited to, a thorough physical examination and blood work (CBC/serum chemistry profile and urinalysis), as well as imaging (thoracic/abdominal radiographs and ultrasound).[4]
- If lymph node aspiration is confirmed, Add-on Expert Review is recommended for confirmation or if clinically warranted. Additional costs may apply.
- If lymph node lesions are not aspirated, please do not use the lymph node algorithm in the Vetscan Imagyst AI Masses application.

References: 1. Blauvelt M and Messick JB. Chapter 11 The Lymph Nodes. In: Cowell RL, Tyler RD, Meinkoth JH, DeNicola DB. *Cowell and Tyler's Diagnostic Cytology and Hematology of the Dog and Cat*. 5th ed. Elsevier; 2020. Pgs. 174-175. **2.** Takuo Ishida. Chapter 95 *Lymph Node Aspiration and Biopsy.* In: Ettinger SJ, Feldman EC, Côté E, eds. *Textbook of Veterinary Internal Medicine*. 8th ed. Elsevier; 2017. Pgs. 366-369. **3.** Nelson RW, Couto CG. Chapter 80 Lymphoma in the cat and dog. In: Nelson RW, Couto CG, eds. Small Animal Internal Medicine. 4th ed. Mosby; 2014: Pgs 1174-1186. **4.** David Vail. Chapter 344 *Hematopoetic Tumors*. In: Ettinger SJ, Feldman EC, Côté E, eds. *Textbook of Veterinary Internal Medicine*. 8th ed. Elsevier; 2017. Pgs. 2065-2078.

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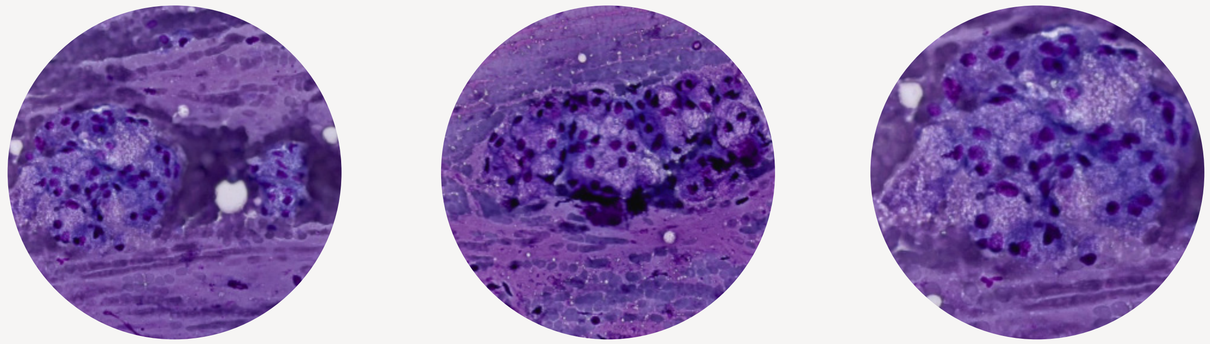
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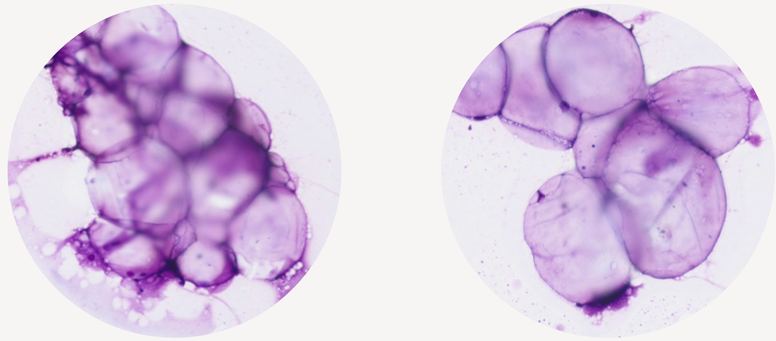
Findings Suggestive of Not Lymph Node

Salivary Tissue



Images obtained by the Vetscan Imagyst at 20x magnification.

Adipose Tissue



Images obtained by the Vetscan Imagyst at 20x magnification.

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Findings Suggestive of Not Lymph Node (cont'd)

Additional Clinical Information

The cytological appearance of the sample is not consistent with aspiration of a peripheral lymph node. Fine needle aspiration (FNA) may occasionally sample tissues adjacent to the intended lymph node target, such as salivary tissue or adipose tissue, in the absence of an adequate number of lymphocytes.

Samples aspirated from salivary glands may reveal clusters of epithelial cells with foamy cytoplasm, acinar arrangements, and background mucin.[1] Samples aspirated from adipose tissue may reveal large, vacuolated cells with eccentric nuclei (adipocytes), characteristic of normal fat tissue.[2]

Potential Next Clinical Steps:

- Consider repeat aspiration if lymphadenopathy remains a clinical concern.
- Add-on Expert Review is available for confirmation or if clinically warranted. Additional costs may apply.

References: 1. Allison RW and Walton RM. Chapter 6 Subcutaneous Glandular Tissue: Mammary, Salivary, Thyroid, and Parathyroid. In: Cowell RL, Tyler RD, Meinkoth JH, DeNicola DB. *Cowell and Tyler's Diagnostic Cytology and Hematology of the Dog and Cat.* 5th ed. Elsevier; 2020. Pgs. 102-120. **2.** David J Fisher. Chapter 5 Cutaneous and Subcutaneous Lesions. In: Cowell RL, Tyler RD, Meinkoth JH, DeNicola DB. *Cowell and Tyler's Diagnostic Cytology and Hematology of the Dog and Cat.* 5th ed. Elsevier; 2020. Pgs. 74-101.

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Lymph Node Aspirate Indeterminate Results

Indeterminate results are those that do not fit an established clinical profile. If you receive an indeterminate result, it is never a stopping point.

Lymph Node Indeterminate Results Diagnostic Profiles‡	
Consistent with lymph node tissue	**Not consistent with lymph node tissue**
Elevated population of hand mirror lymphocytes	Squamous cell carcinoma
Equivocal lymph node findings	Histiocytoma*
Small cell lymphoma*	Mast cell tumor*
Lymph node with metastasis	Plasma cell tumor*
	Neuroendocrine thyroid
	Cutaneous melanoma

Additional Clinical Information

Indeterminate Results means the cytological appearance of the sample does not match one of the clinical profiles previously outlined. This result could be due to equivocal results from the lymph node in which the cytologic findings can appear similar (some cases of lymphoma vs. reactive lymphoid hyperplasia). In addition, if there are hand-mirror lymphocytes present in large numbers or a small cell lymphoma, these will be classified as “Indeterminate Results – The findings do not match any diagnostic categories”.

If the sample is taken from a tissue outside the domain of the Vetscan Imagyst AI Masses – Lymph Node algorithm, and a majority of the total nucleated cell count consists of lymphocytes (e.g., cutaneous, subcutaneous, mammary, or organ aspirates), the result will be classified as “Indeterminate Results - The findings do not match any established diagnostic categories.”

Potential Next Clinical Steps:

- Add-on Expert Review is available for confirmation or if clinically warranted. Additional costs may apply.
- If lymph node lesions are not aspirated (see: histiocytoma, mast cell tumor and plasma cell tumor, for example), please do not use the lymph node algorithm in the Vetscan Imagyst AI Masses application.

‡Additional clinical profiles not listed here may fall under "indeterminate results". See Indeterminate Results, Table 5.3, pgs. 76-77, for more information.
*Look at microscopic findings to classify information.

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Skin/subcutaneous Mass Aspirate Clinical Profile Reference Guide

Why Aspirate a Cutaneous or Subcutaneous Mass?

Cutaneous and subcutaneous masses on canine and feline patients are often commonly sampled sites for cytological evaluation because these masses can be appreciated easily by the pet owner and are easily sampled by veterinarians.[1] Cytology has a relatively low risk of complications and has a shorter turnaround time than histopathology.[2] Cytology can also potentially provide information that allows for further diagnostic or medical/surgical planning for case management.[2]

Skin/subcutaneous Mass Aspirate Clinical Profiles†

Note: The following potential clinical next step applies to all skin/subcutaneous mass aspirate clinical profiles, including Indeterminate Results:

For questions regarding case management and treatment, please consult the Zoetis Diagnostics Virtual Laboratory Expert Clinical Consultation Service.

Skin/subcutaneous Mass Clinical Profiles
Histiocytoma
Mast cell tumor
Plasma cell tumor
Lipoma/adipose tissue
Keratin containing lesion
Inflammation (Inflammatory lesion)*

*Look at microscopic findings to classify information.
†Additional clinical profiles not listed here may fall under "indeterminate results". See Indeterminate Results, Table 5.4, pg. 78-79, for more information.
References: 1. David J Fisher. Chapter 5 Cutaneous and Subcutaneous Lesions. In: Cowell RL, Tyler RD, Meinkoth JH, DeNicola DB. Cowell and Tyler's Diagnostic Cytology and Hematology of the Dog and Cat. 5th ed. Elsevier; 2020. Pgs. 74-101. **2.** Monti P and Cian F. Chapter 21 Diagnostic Cytology, BSAVA Manual of Canine and Feline Clinical Pathology. Pgs. 398-402.

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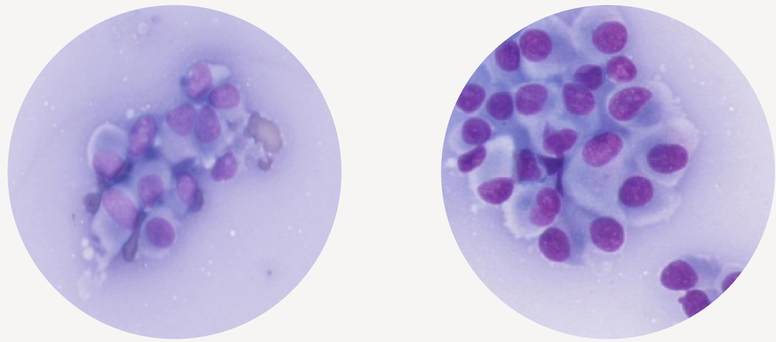
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Findings Suggestive of Histiocytoma



Images obtained by the Vetscan Imagyst at 40x magnification.

Additional Clinical Information

The cytological appearance of the sample is consistent with a histiocytoma. Cytologically, a histiocytoma consists of a high number of round cells with a moderate amount of pale to lightly basophilic cytoplasm, and round to oval nuclei that is central to eccentric in location.[1]

Lesions are typically solitary and they present as hairless button-shaped masses on the skin surface.[2,3] They are most prevalent in young dogs (less than two to three years of age) and incidence drops after that age.[2,3] As the tumor regresses, small lymphocytes may increase in number cytologically.[1,3]

Potential Next Clinical Steps

- Histiocytomas tend to regress within two to three months. If the lesion persists beyond three months, excision with histopathology is recommended.[3]
- Add-on Expert Review is available for confirmation or if clinically warranted. Additional costs may apply.

References: 1. Jacocks K, Hoepp N, DeNicola DB. Chapter 4 Round Cells. In: Cowell RL, Tyler RD, Meinkoth JH, DeNicola DB. *Cowell and Tyler's Diagnostic Cytology and Hematology of the Dog and Cat.* 5th ed. Elsevier; 2020. Pgs. 65-73. **2.** David J Fisher. Chapter 5 Cutaneous and Subcutaneous Lesions. In: Cowell RL, Tyler RD, Meinkoth JH, DeNicola DB. *Cowell and Tyler's Diagnostic Cytology and Hematology of the Dog and Cat.* 5th ed. Elsevier; 2020. Pgs. 74-101. **3.** Laurel Williams. Chapter 350 Canine and Feline Histiocytic Disease. In: Ettinger SJ, Feldman EC, Côté E, eds. *Textbook of Veterinary Internal Medicine.* 8th ed. Elsevier; 2017. Pgs. 2115-2119.

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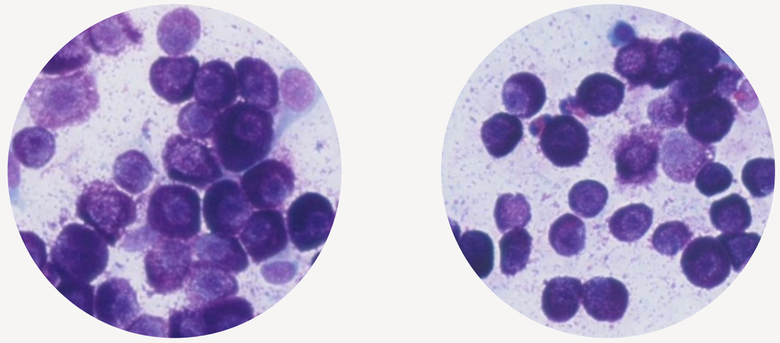
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Findings Suggestive of Mast Cell Tumor



Images obtained by the Vetscan Imagyst at 40x magnification.

Additional Clinical Information

The cytological appearance of the sample is consistent with a mast cell tumor (MCT). Cytologically, MCTs consist of a high number of round cells with a moderate to abundant amount of pale basophilic cytoplasm with numerous coarse, round to fine, purple granules that are often seen throughout the background of the preparation.[1,2]

Mast cell tumors are the most common cutaneous malignancy in dogs and second most common in cats.[3] In cats, cutaneous MCTs exhibit a wider range of cytologic appearances and can be further classified through histopathological evaluation.[1] Cytological features suggestive of a poorly differentiated, high-grade tumor may include binucleation, multinucleation, mitotic figures, and marked anisocytosis and anisokaryosis.[2]

Potential Next Clinical Steps:

- Medical management of MCTs in dogs and cats depends on tumor grade, location, extent of disease (localized vs. systemic) and overall prognosis. It typically involves systemic therapy for non-resectable, high-grade, metastatic or recurrent tumors.[3] For further classification of the MCT, send a sample for histopathology.
- Add-on Expert Review is available for confirmation or if clinically warranted. Additional costs may apply.

References: 1. Jacocks K, Hoepp N, DeNicola DB. Chapter 4 Round Cells. In: Cowell RL, Tyler RD, Meinkoth JH, DeNicola DB. *Cowell and Tyler's Diagnostic Cytology and Hematology of the Dog and Cat.* 5th ed. Elsevier; 2020. Pgs. 65-73. **2.** David J Fisher. Chapter 5 Cutaneous and Subcutaneous Lesions. In: Cowell RL, Tyler RD, Meinkoth JH, DeNicola DB. *Cowell and Tyler's Diagnostic Cytology and Hematology of the Dog and Cat.* 5th ed. Elsevier; 2020. Pgs. 74-101. **3.** Douglas H Thamm. Chapter 349 Mast Cell Disease. In: Ettinger SJ, Feldman EC, Côté E, eds. T*extbook of Veterinary Internal Medicine*. 8th ed. Elsevier; 2017. Pgs. 2115-2119.

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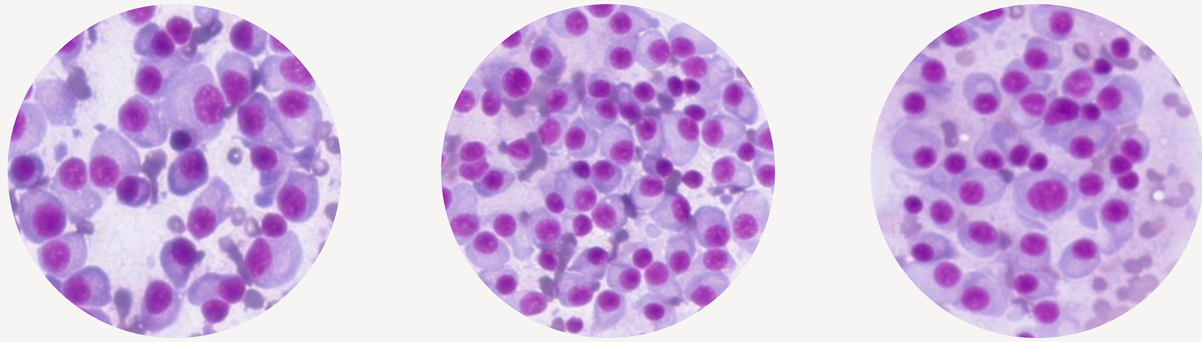
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Findings Suggestive of Plasma Cell Tumor



Images obtained by the Vetscan Imagyst at 40x magnification.

Additional Clinical Information

The cytological appearance of the sample is consistent with a plasma cell tumor. Cytologically, plasma cell tumors consist of a high number of round cells with a round to oval nuclei, uniform to coarse chromatin, and a moderate amount of moderately to deeply basophilic cytoplasm with rounded borders.[1,2] The lesion is typically well circumscribed, raised, smooth and often pink to red in color.[2,3] Plasma cell tumors are more common in dogs and thought to be rarer in cats.[2]

Potential Next Clinical Steps:

- The treatment of choice for cutaneous plasma cell tumors is surgical excision.[3]
- Add-on Expert Review is available for confirmation or if clinically warranted. Additional costs may apply.

References: 1. Jacocks K, Hoepp N, DeNicola DB. Chapter 4 Round Cells. In: Cowell RL, Tyler RD, Meinkoth JH, DeNicola DB. *Cowell and Tyler's Diagnostic Cytology and Hematology of the Dog and Cat.* 5th ed. Elsevier; 2020. Pgs. 65-73. **2.** David J Fisher. Chapter 5 Cutaneous and Subcutaneous Lesions. In: Cowell RL, Tyler RD, Meinkoth JH, DeNicola DB. *Cowell and Tyler's Diagnostic Cytology and Hematology of the Dog and Cat.* 5th ed. Elsevier; 2020. Pgs. 74-101. **3.** Kenneth M Rassnick. Chapter 345 Tumors of the Skin. In: Ettinger SJ, Feldman EC, Côté E, eds. Textbook of Veterinary Internal Medicine. 8th ed. Elsevier; 2017. Pgs. 2078-2083.

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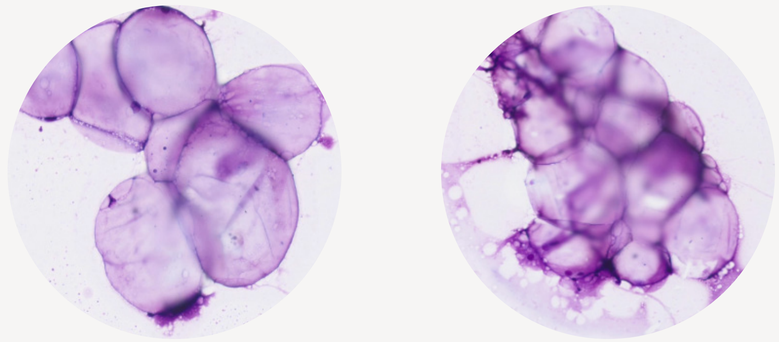
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Findings Suggestive of Lipoma/Adipose Tissue



Images obtained by the Vetscan Imagyst at 40x magnification.

Additional Clinical Information

The cytological appearance of the sample is consistent with a lipoma or adipose tissue. Cytologically, lipomas/adipose tissue consist of abundant large adipocytes with vacuolated cytoplasm filled with lipid and fragile cells that may rupture, leaving a lipidic background.[1]

These samples may contain a small number of spindle cells and bare nuclei.[1] Adipocytes from a lipoma cannot be differentiated from normal subcutaneous fat cells, so care should always be given to avoid sampling surrounding normal tissue.[1] Lipomas are more common in dogs and less common in cats.[1,2]

Potential Next Clinical Steps:

- If a lesion is clinically suspected to be another neoplasia other than lipoma and only adipocytes are sampled, re-aspiration is recommended.[2]
- The management of lipomas depends on factors such as size, location, rate of growth, and impact on mobility or function. Most lipomas are benign and do not require intervention unless they cause clinical problems.
- Add-on Expert Review is available for confirmation or if clinically warranted. Additional costs may apply.

References: 1. David J Fisher. Chapter 5 Cutaneous and Subcutaneous Lesions. In: Cowell RL, Tyler RD, Meinkoth JH, DeNicola DB. *Cowell and Tyler's Diagnostic Cytology and Hematology of the Dog and Cat*. 5th ed. Elsevier; 2020. Pgs. 74-101. **2.** Ryan M Dickinson. Chapter 87 Cytology of the Skin and Subcutaneous Tissues. In: Ettinger SJ, Feldman EC, Côté E, eds. *Textbook of Veterinary Internal Medicine*. 8th ed. Elsevier; 2017. Pgs. 345-348.

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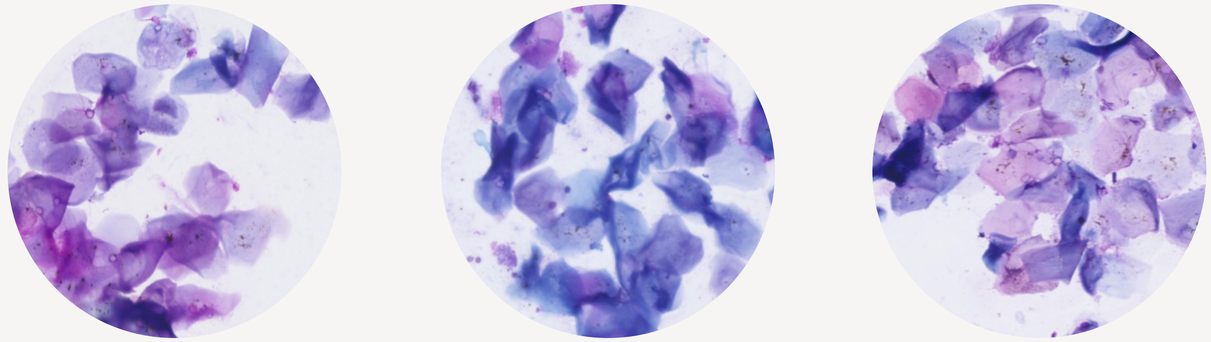
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Findings Suggestive of Keratin Containing Lesion



Images obtained by the Vetscan Imagyst at 40x magnification.

Additional Clinical Information

The cytological appearance of the sample is consistent with a keratin containing lesion. Cytologically, these lesions typically produce large amounts of keratin debris that is blue in color and may be mixed in with variable numbers of anucleate cornifying squamous epithelial cells.[1] Keratin may be irritative to surrounding tissues so if ruptured, this can incite neutrophilic inflammation.[1] These lesions are typically benign, but malignant forms do exist.

Potential Next Clinical Steps:

- Biopsy is required for differentiation between benign and malignant forms, even though benign is much more common.[1]
- Add-on Expert Review is available for confirmation or if clinically warranted. Additional costs may apply.

References: 1. David J Fisher. Chapter 5 Cutaneous and Subcutaneous Lesions. In: Cowell RL, Tyler RD, Meinkoth JH, DeNicola DB. *Cowell and Tyler's Diagnostic Cytology and Hematology of the Dog and Cat*. 5th ed. Elsevier; 2020. Pgs. 74-101.

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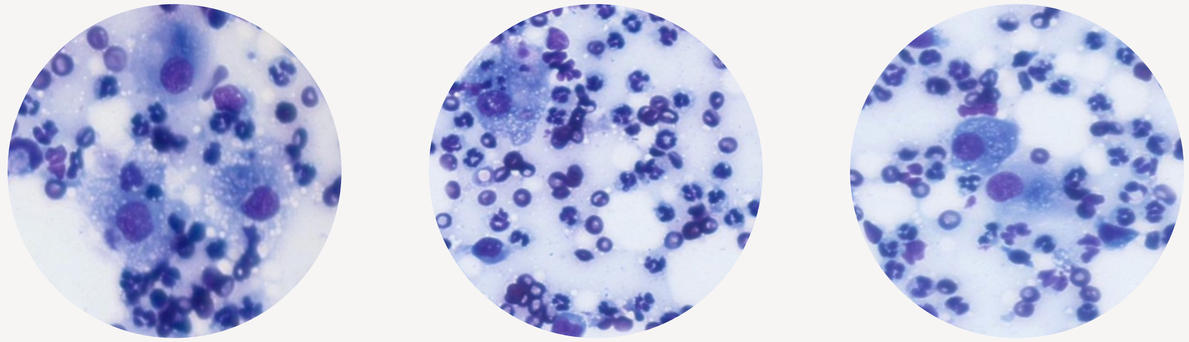
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Findings Suggestive of Inflammation (Inflammatory Lesion)



Images obtained by the Vetscan Imagyst at 40x magnification.

Additional Clinical Information

The cytological appearance of the sample is consistent with inflammation. Sampling from inflammatory lesions can yield large numbers of cells, sometimes with no obvious tissue cells.[1] These lesions can result from infectious and noninfectious causes and the types of inflammatory cells present may aid in determining the underlying process.[1]

Characterization of the inflammation can be determined by looking at the inflammatory cells present in the sample[1] (i.e., neutrophils, eosinophils, macrophages and lymphocytes reported in the Microscopic Findings of AI Masses Report).

A neutrophilic response can be elicited by a bacterial infection, but may also be seen with fungal/yeast infection or a non-infectious etiology.[1] An eosinophilic response is common in response to exogenous parasites or a hypersensitivity.[1] A macrophagic response can be elicited by chronic inflammatory responses.[1]

Potential Next Clinical Steps:

- Clinical management involves identifying and treating the underlying cause while providing supportive care. Microscopic findings will report neutrophils containing bacteria (rare, moderate, marked) if present.
- If clinically suspicious of a non-bacterial infectious agent, it is recommended to request Add-on Expert Review for that case.
- Add-on Expert Review is available for confirmation or if clinically warranted. Additional costs may apply.

References: 1. David J Fisher. Chapter 5 Cutaneous and Subcutaneous Lesions. In: Cowell RL, Tyler RD, Meinkoth JH, DeNicola DB. *Cowell and Tyler's Diagnostic Cytology and Hematology of the Dog and Cat*. 5th ed. Elsevier; 2020. Pgs. 74-101.

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Skin/subcutaneous Mass Aspirate Indeterminate Results

Indeterminate results are those that do not fit a clinical profile. If you receive an indeterminate result, it is never a stopping point.

Skin/subcuteanous Masses Indeterminate Results Diagnostic Profiles‡	
Mammary carcinomas	Hepatoid gland tumor
Melanocytic neoplasm (cutaneous melanoma)	Spindle cell tumor/Soft tissue sarcomas
Sebaceous hyperplasia	Squamous cell carcinoma
Cutaneous lymphoma	Transmissible Venereal Tumor (TVT)
Basal cell tumor	

Additional Clinical Information

The cytologic appearance of the sample does not match any established diagnostic categories for cutaneous and subcutaneous masses. This result could be due to equivocal results (i.e., a not well differentiated round cell tumor) or a round cell tumor that is not identified and classified by the algorithm such as Transmissible Venereal Tumor (TVT).

In addition, if masses including but not limited to soft tissue sarcoma, cutaneous lymphoma, cutaneous melanoma or other less common masses not listed above are aspirated, these will be classified as “Indeterminate Results – The findings do not match any diagnostic categories”.

Potential Next Clinical Steps:

- If the mass aspirated is not a subcutaneous/cutaneous mass, please do not use the subcutaneous algorithm in the Vetscan Imagyst AI Masses application.
- Add-on Expert Review is available for confirmation or if clinically warranted. Additional costs may apply.

†Additional clinical profiles not listed here may fall under "indeterminate results". See Indeterminate Results, Table 5.4, pgs. 78–79, for more information.

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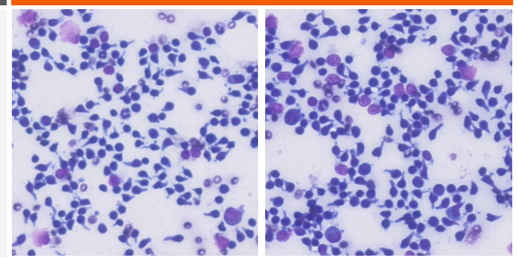
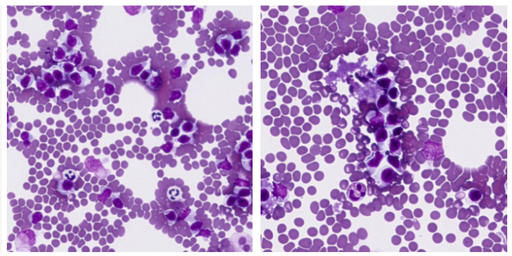
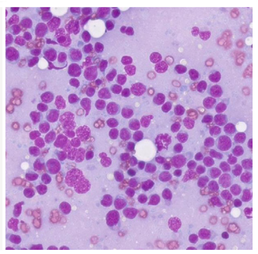
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Indeterminate Results Atlas

Indeterminate results are those that to do not fit into an established clinical profile. If you receive an indeterminate result, it is never a stopping point. Add-on Expert Review* for additional analysis by a clinical pathologist is always recommended for an indeterminate result. Refer to Tables 5.3 and 5.4 below for quick reference to less common lymph node and skin/subcutaneous masses that will yield an indeterminate result.

Table 5.3 *Lymph node – Indeterminate Result Examples*

Lymph node – Indeterminate Result Examples Consistent with Lymph Tissue	Scan Images Images obtained by the Vetscan Imagyst at 40x magnification.
Hand mirror lymphocytes	
Small cell lymphoma†	
Equivocal findings	

*Additional costs may apply.
†This clinical profile should always be tested as a subcutaneous mass sample and will yield an indeterminate result if tested via the AI Masses lymph node setting.

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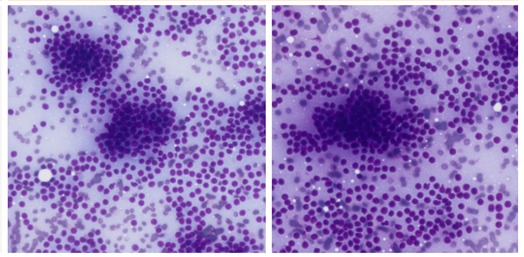
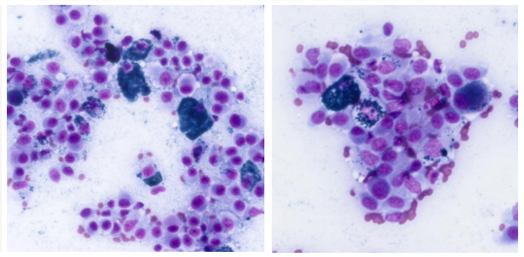
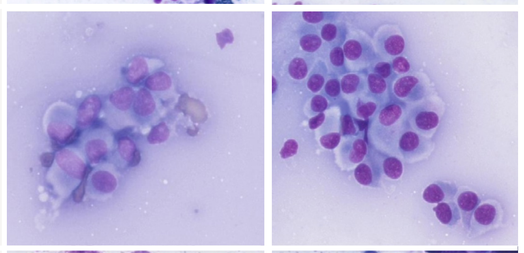
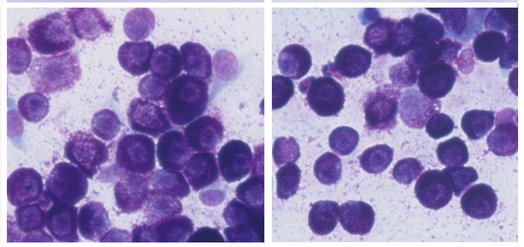
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Table 5.3 *Lymph node – Indeterminate Result Examples (cont'd)*

Lymph node – Indeterminate Result Examples Not consistent with Lymph Tissue	Scan Images Images obtained by the Vetscan Imagyst at 40x magnification.
Neuroendocrine thyroid	
Cutaneous melanoma	
Histiocytoma*	
Mast cell tumor*	

*This clinical profile should always be tested as a subcutaneous mass sample and will yield an indeterminate result if tested via the AI Masses lymph node setting.

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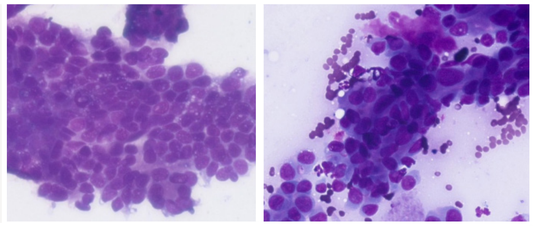
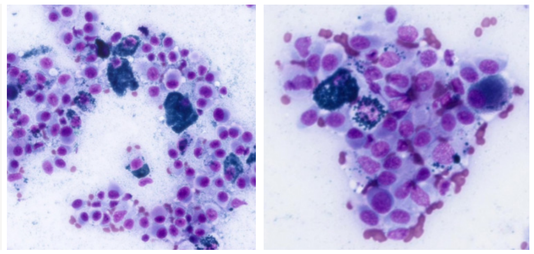
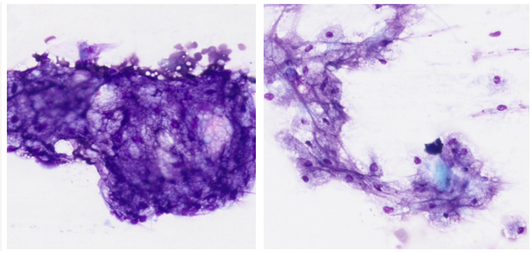
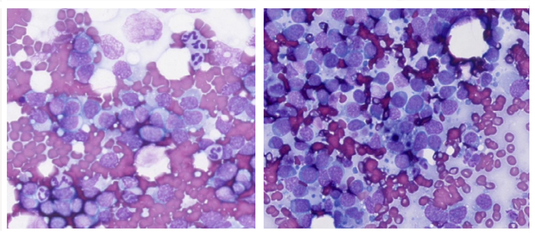
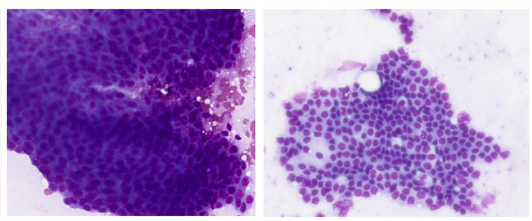
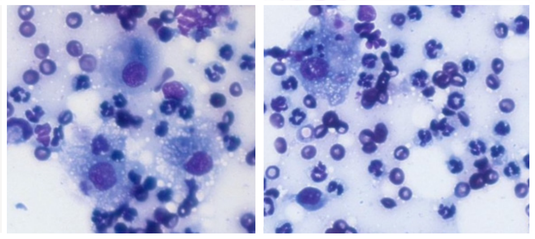
6 Using Vetscan Imagyst AI Masses

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What Is Vetscan Imagyst AI Masses?

Table 5.4: *Skin/subcutaneous Masses – Indeterminate Results Examples*

Skin/subcutaneous Masses – Indeterminate Result Examples	Scan Images Images obtained by the Vetscan Imagyst at 40x magnification.
Mammary carcinomas	
Melanocytic neoplasm (cutaneous melanoma)	
Sebaceous hyperplasia	
Cutaneous lymphoma	
Basal cell tumor	
Lesion Inflamation (f you detect inflammation, Add-on Expert Review† is always recommended.)	

†Additional cost may apply.

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- Lymph Node Clinical Reference Guide
- Skin/subcutaneous Mass Clinical Reference Guide
- Indeterminate Results Atlas

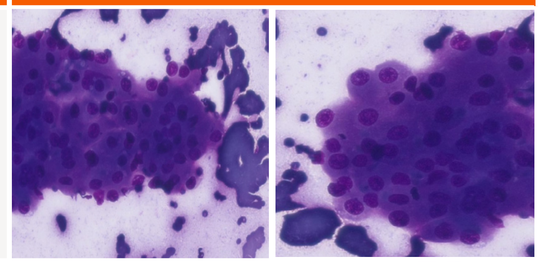
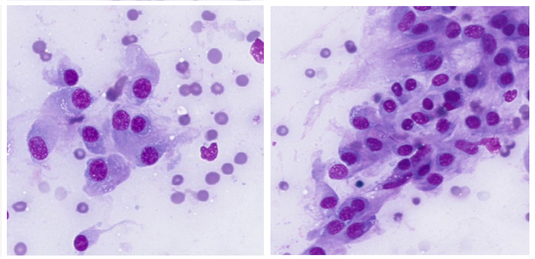
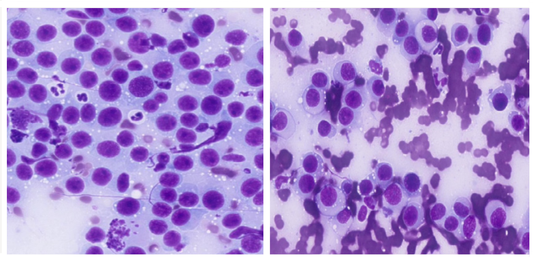
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Table 5.4: *Skin/subcutaneous Masses – Indeterminate Results Examples (cont'd)*

Skin/subcutaneous Masses – Indeterminate Result Examples	Scan Images Images obtained by the Vetscan Imagyst at 40x magnification.
Hepatoid gland tumor	
Spindle cell tumor/Soft tissue sarcomas	
Transmissible Venereal Tumor (TVT)	

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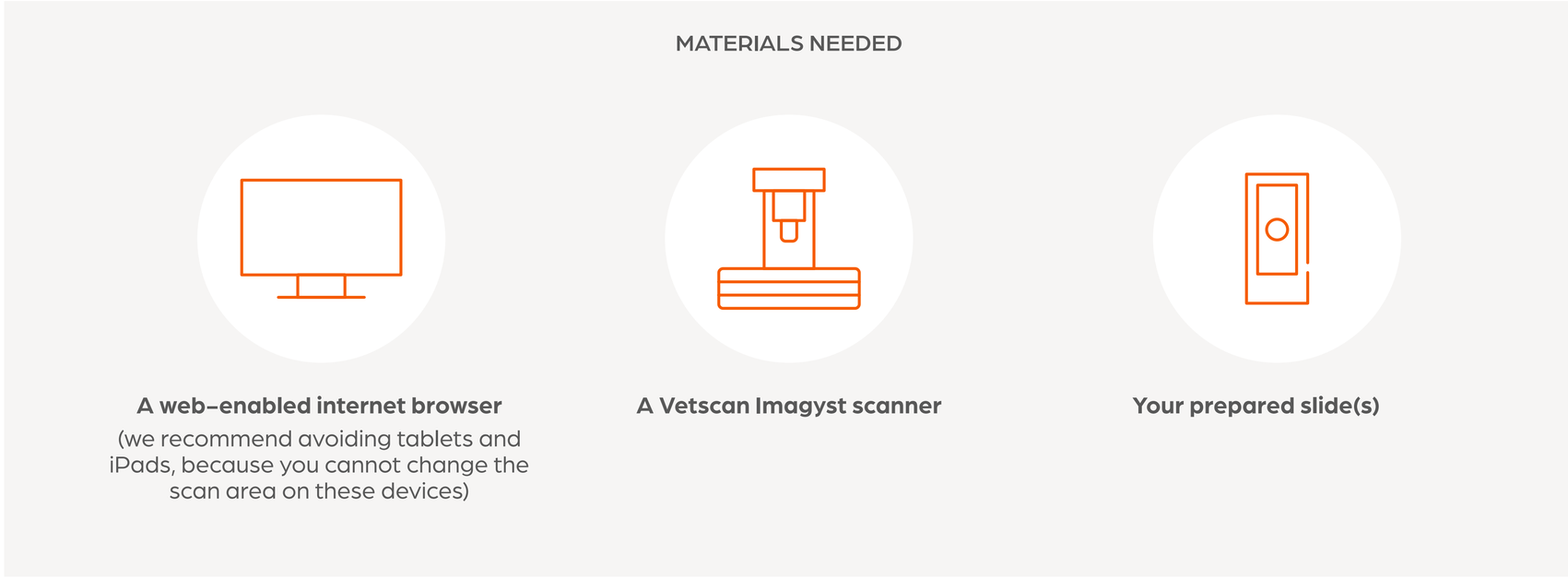
How to Run an AI Masses Analysis

Sample Preparation

Follow the same sample preparation procedure for Vetscan Imagyst AI Masses that you would use for Digital Cytology. You should prepare the sample using a fine needle aspirate (FNA) or fine needle biopsy (FNB) technique. However, the same sample types will not apply. AI Masses allows you to test only peripheral common lymph node and skin/subcutaneous mass samples, and you can submit one slide for one sample site (see Section 5: What Is Vetscan Imagyst AI Masses?).

Note: For detailed sample preparation instructions, see Section 3: Sample Preparation, Tissue Cytology — Fine Needle Aspiration/Biopsy

Figure 6.0 *Vetscan Imagyst Required Materials for Running an AI Masses Analysis*



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Best Practices

It's important to follow protocols and instructions carefully when using AI Masses for accurate testing. Here are some general best practices to follow:

- ✓ Properly prepare your cytology slides using the required collection, handling, staining and coverslipping procedures (see Section 3)
- ✓ Place the slide correctly on the scanner with the sample side up and label facing right
- ✓ Ensure the slide is fully within the scanning area
- ✓ Keep the scanner clean (see Section 8)
- ✓ Check for any obstructions near the scanner that might impede movement
- ✓ Follow the recommended workflow for scanning and submitting digital slides through the Vetscan Imagyst platform
- ✓ Ensure there is no immersion oil on top of the coverslip and use only enough to cover the sample, as excess oil can contaminate the scanner lens

AI Masses Workflow: How–To Guide

This section provides detailed instructions on how to order an AI Masses test and use the Vetscan Imagyst scanner. The instructions are similar to those for Digital Cytology, with the following exception: when using AI Masses, an AI report is generated independent of the add-on expert clinical pathologist review. Add-on Expert Review* must be requested separately as outlined in Step 7 below.

Step 1
Order the test

1. Make sure your scanner is connected to the network and has been powered on.
2. Open your practice information management software and locate the patient's chart and medical record.
3. Enter the treatment code for the test you are performing. If your software is connected to the Vetscan Hub™†, you can order the test from there.
4. Open the treatment list and select the test type from the list of available tests and click **Done**.
5. Log into Vetscan Imagyst and select **Scan** for the correct sample. The sample information, patient name and patient ID will come pre-populated on the screen.
6. If your clinic does not have connectivity enabled, the test can be initiated directly on the Imagyst platform: select the **Add New Test** icon, then enter the patient ID, name and species in the **Add Test** window and select **Create**.

*Additional costs may apply.
†Vetscan Hub is an all-in-one intuitive platform that allows you to synchronize your in-clinic diagnostics with select PIMS software on a single screen, for a seamless workflow, comprehensive insights and enhanced patient care. Tests ordered in your PIMS appear instantly on the Vetscan Hub, which then displays the results and shares them back to your PIMS. The Vetscan Hub also connects your in-clinic workflow to the Virtual Laboratory ecosystem through ZoetisDx.com.

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AI Masses Workflow: How–To Guide (cont'd)

Step 2
Complete the patient history

1. Add information for the preparation type and body region

Step 3
Select the scanner

1. Once you have entered all the information, select a scanner
2. If the tray is closed, click **Open Tray**
3. Unlock the slide holder

Step 4
Load and scan the prepared slide, and submit the order

1. With the slide locking mechanism open, place the slide on the scanner sample side up, with the sample on your left and the frosted edge to your right
2. Close the locking mechanism
3. Return to the Vetscan Imagyst on your laptop, tablet or mobile device and click the **Preview** button
4. When the preview appears, review the suggested scan area and estimated time to scan. If both are acceptable, click **Continue** and the scanner will begin scanning
5. When you've completed, click the **Close** button
6. The scan sample will be analyzed

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AI Masses Workflow: How–To Guide (cont'd)

Step 5
Find and review the AI report

1. Navigate to the inbox
2. When the AI report is finished, it will move from the **Pending Orders** tab to the **Ready for Review** tab where the result will be displayed
3. Find your specific test order and click the **Review** button to open the report in the report viewer
4. Vetscan Imagyst will automatically select the four most representative areas of the slide for your report. You can also manually select additional pictures for inclusion in the PDF report
5. If you would like to have a closer look at the slide, click **View Slide**, then zoom in as needed
6. To share the report for viewing within the Vetscan Imagyst, click the **Share** button to bring up a link

Anyone can review the Vetscan Imagyst results with the shareable PDF report.

Step 6
Finalize the report

Finalizing the report transfers it to the Vetscan Hub™ and the ZoetisDx portal where it can be seen with other diagnostic results.

1. After you review the report, click **Finalize**, which indicates that you have seen the report and moves it from the **Ready to Review** tab to the **Test History** tab
2. Once the results have transferred over, the report can be accessed and viewed within the Vetscan Hub™* with other diagnostic results
3. Finally, the report is sent to your patient information management system software. This completes the test order

*Vetscan Hub is an all-in-one intuitive platform that allows you to synchronize your in-clinic diagnostics with select PIMS software on a single screen, for a seamless workflow, comprehensive insights and enhanced patient care. Tests ordered in your PIMS appear instantly on the Vetscan Hub, which then displays the results and shares them back to your PIMS. The Vetscan Hub also connects your in-clinic workflow to the Virtual Laboratory ecosystem through ZoetisDx.com.

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AI Masses Workflow: How–To Guide (cont'd)

Step 7

Add–on Expert Review

If you would like an expert clinical pathologist to review any of your AI Masses tests, you can request an Add-on Expert Review.* Additional costs may apply.

1. Initiate the test within your system, then go to the Vetscan Imagyst application inbox and select **Start** for the correct sample
2. If your clinic does not have connectivity enabled, the test can be initiated directly on the Vetscan Imagyst platform: select the **Add New Test** icon, then enter the patient ID and name in the **Add Test** window and select **Create**
3. Select **Add-on Expert Review** and enter the same patient name and ID from the original test, then click **Create**
   The most recent results from that patient will be automatically selected
4. Verify the selection, changing it if needed, and click **Select Test**
5. Enter information for the patient's breed, age and gender. (The patient's species is already set.) Include a brief clinical history
6. Click on the pre-populated sample card to add any additional information not entered in the original test
7. You can also attach additional JPEG or PDF files that the pathologist might find useful. We strongly recommend attaching all available patient reports
8. If you wish to add additional prepared slides for the pathologist to review, repeat Step 4 above to load and scan each slide. You can submit up to three additional prepared slides

Step 8

Find and review expert pathologist report

Finalizing the report transfers it to the Vetscan Hub™ and the ZoetisDx portal where it can be seen with other diagnostic results.

1. After attaching the files, click **Close** if your request isn't yet complete, or **Submit Order** if you're ready to submit your request
2. Your test order will show in the **Pending Order** tab in the inbox while it's out for review as either **Waiting for Assignment** or **Assigned to Pathologist**
3. The report will be available in the **Ready for Review** tab after the clinical pathologist finishes their review
4. Find your specific test order and click the **Review** button to open the report in the report viewer
5. After reviewing the report, click **Acknowledge**. The test will move from the **Ready for Review** tab to the **Test History** tab
   The results will be available in Vetscan Hub and PIMS software

Repeat Step 6 above to finalize the expert pathologist's report.

*Add-on Expert Review will be available for all AI Masses tests when clinically warranted to ensure you feel supported and confident in your diagnosis.

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Sample AI Masses Report

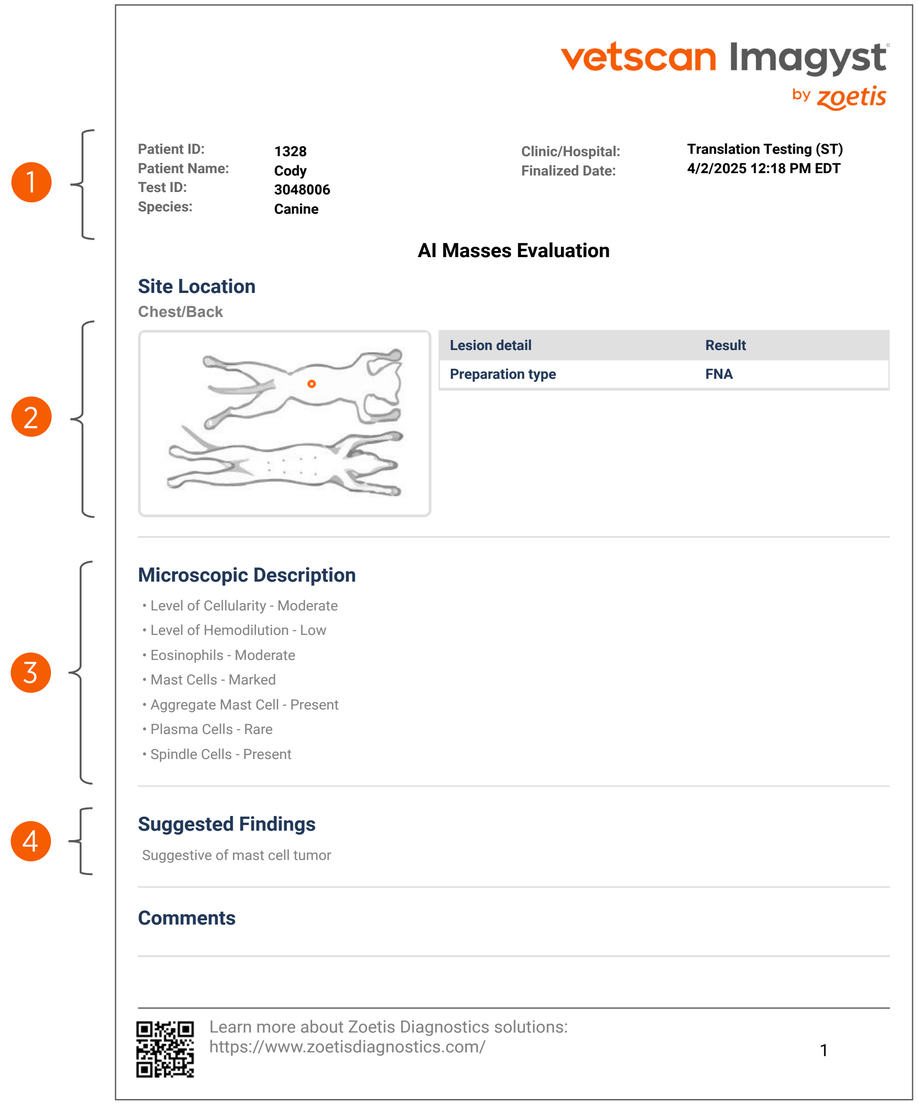
AI Masses provides comprehensive reports designed to be shareable with clients for visibility, which can help inform and educate clients, improve communication and build trust. Seeing detailed images of their pet's cells can help make the diagnosis easier to understand for your clients, and allows for greater involvement in their pet's treatment, potentially reducing anxiety and frustration.

The following AI Masses sample report features a FNA from a mass on the back of a male dog named Cody.

Page 1 features:

1. Patient information
2. Description of the sample type and site/body region
3. A detailed microscopic description of the scans
4. Suggested findings

Figure 6.1 *Vetscan Imagyst Sample AI Masses Report*


vetscan Imagyst by zoetis

1

Patient ID: 1328
Patient Name: Cody
Test ID: 3048006
Species: Canine

Clinic/Hospital: Translation Testing (ST)
Finalized Date: 4/2/2025 12:18 PM EDT

AI Masses Evaluation

Site Location

Chest/Back

2

Lesion detail	Result
Preparation type	FNA

Microscopic Description

3

- Level of Cellularity - Moderate
- Level of Hemodilution - Low
- Eosinophils - Moderate
- Mast Cells - Marked
- Aggregate Mast Cell - Present
- Plasma Cells - Rare
- Spindle Cells - Present

Suggested Findings

4

Suggestive of mast cell tumor

Comments

Learn more about Zoetis Diagnostics solutions:
https://www.zoetisdiagnostics.com/

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Sample AI Masses Report (cont'd)

Pages 2 features:

1. High-definition scan images
   - Pet owner focus groups found 100% preference for visual results reports.[1]
   - Vetscan Imagyst AI Masses reports contain clear, vivid, high-definition scan images that can help inform and educate clients
   - The ability to show clients detailed imagery within a customer-facing report provides a tangible anchor when sharing results that can help aid client communication.
   - Seeing what you see — detailed, familiar images that resemble cells — can also help clients to better understand the diagnosis and recommended treatment protocol

Note: You have the the option to request an Add-on Expert Clinical Pathologist Review*, which includes a detailed analysis of the slide(s) by a board-certified clinical pathologist

Figure 6.2 *Vetscan Imagyst Sample AI Masses Report (cont'd)*



*Additional costs may apply.

Reference: 1. Janke N, Coe JB, Bernardo TM, Dewey CE, Stone EA. Use of health parameter trends to communicate pet health information in companion animal practice: A mixed methods analysis. Vet Rec. 2022;190(7):e1378. doi:10.1002/vetr.1378.

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The Virtual Laboratory

The Virtual Laboratory is an integrated support network of board-certified specialists paired with expert-level AI[1-12], enhancing every element of your diagnostic practice to make diagnostic and treatment decisions with confidence.

- ✓ **Best-in-class* AI**
  Powerful deep-learning AI analysis, backed by years of demonstrated reliability and millions of scans completed†
- ✓ **Anytime‡ expert support**
  Convenient expert review and complimentary specialist consultations available via Zoom™ § or email, for the support you need to diagnose any case
- ✓ **Connected diagnostic insights**
  Fully integrated workflow with point-of-care results, specialist consultation insights and Zoetis Reference Laboratories — all accessible in your ZoetisDx portal

Figure 7.1 *The Zoetis Diagnostics Portfolio*



*Vetscan Imagyst is the only commercial AI analyzer available on the market offering six testing capabilities.
†Completed on Vetscan Imagyst.
‡Dependent on consultant availability.
§Zoom is a trademark of Zoom Video Communications, Inc.

References: 1. Data on file, Study No. DHXMZ-US-25-285, 2025, Zoetis Inc. **2.** Data on file, Study No. DHXMZ-US-25-286, 2025, Zoetis Inc. **3.** Data on file, Study No. DHX6Z-US-23-205, 2024, Zoetis Inc. **4.** Data on file, Study No. DHX6Z-US-23-206, 2024, Zoetis Inc. **5.** Data on file, Study No. DHX6Z-US-23-209, 2024, Zoetis Inc. **6.** Data on file, Study No. DHX6Z-US-24-257, 2024, Zoetis Inc. **7.** Data on file. Study No. DHX6Z-US-24-242, 2024, Zoetis Inc. **8.** Data on file, Study No. DHX6Z-US-24-275, 2024, Zoetis Inc. **9.** Data on file, Study No. DHX6Z-US-24-276, 2024, Zoetis Inc. **10.** Data on file, Study No. DHX6Z-US-23-222, 2023, Zoetis Inc. **11.** Data on file, Study No. DHX6Z-US-22-131, 2022, Zoetis Inc. **12**. Data on file. Study No. DHXMZ-US-24-235, 2024, Zoetis Inc.

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A More Complete Diagnostic Picture

Cutting-edge AI and specialist expertise combine in the Virtual Laboratory to offer comprehensive results that can help you elevate your diagnostic workup and individualize patient care. The best-in-class* AI algorithm that powers Vetscan Imagyst analysis is trained by board-certified clinical specialists and backed by years of demonstrated reliability. Complimentary specialist consultations are available on any case, anytime[†].

End–to–End Expert Support

The Virtual Laboratory provides access to a global support network of board-certified specialists across 14 different specialties for complimentary consultations and the ability for Add-on Expert Review[‡] with the Vetscan Imagyst.

How to Schedule a Complimentary Consultation

You can schedule consultations through your ZoetisDx portal, online or in the mobile app. Connect via email anytime or Zoom™[§] appointment on the date and time of your choosing — whether you need recommendations for further diagnostic testing, guidance on diagnosis and treatment, or a second opinion.

1. After logging in, start a New Consultation request from either the main navigation or the right side panel of the home page
2. Choose the Specialty and Consultation Type, and select either a scheduled Zoom appointment or an emailed response Click **Let's Go**
3. Complete the request form. Zoetis specialists are already able to view all Zoetis test results in your account, but you can add any relevant case details
4. When finished, click **Submit**
5. If you selected a Zoom appointment, you will receive an email confirmation with the date, time and Zoom link

Note: Detailed case reports are available within 24 business hours after every consultation. You can access them on the home, patient information and consultation pages of your ZoetisDx portal.

*Vetscan Imagyst is the only commercial AI analyzer available on the market offering six testing capabilities.
[†]Dependent on consultant availability.
[‡]Additional costs may apply.
[§]Zoom is a trademark of Zoom Video Communications, Inc.

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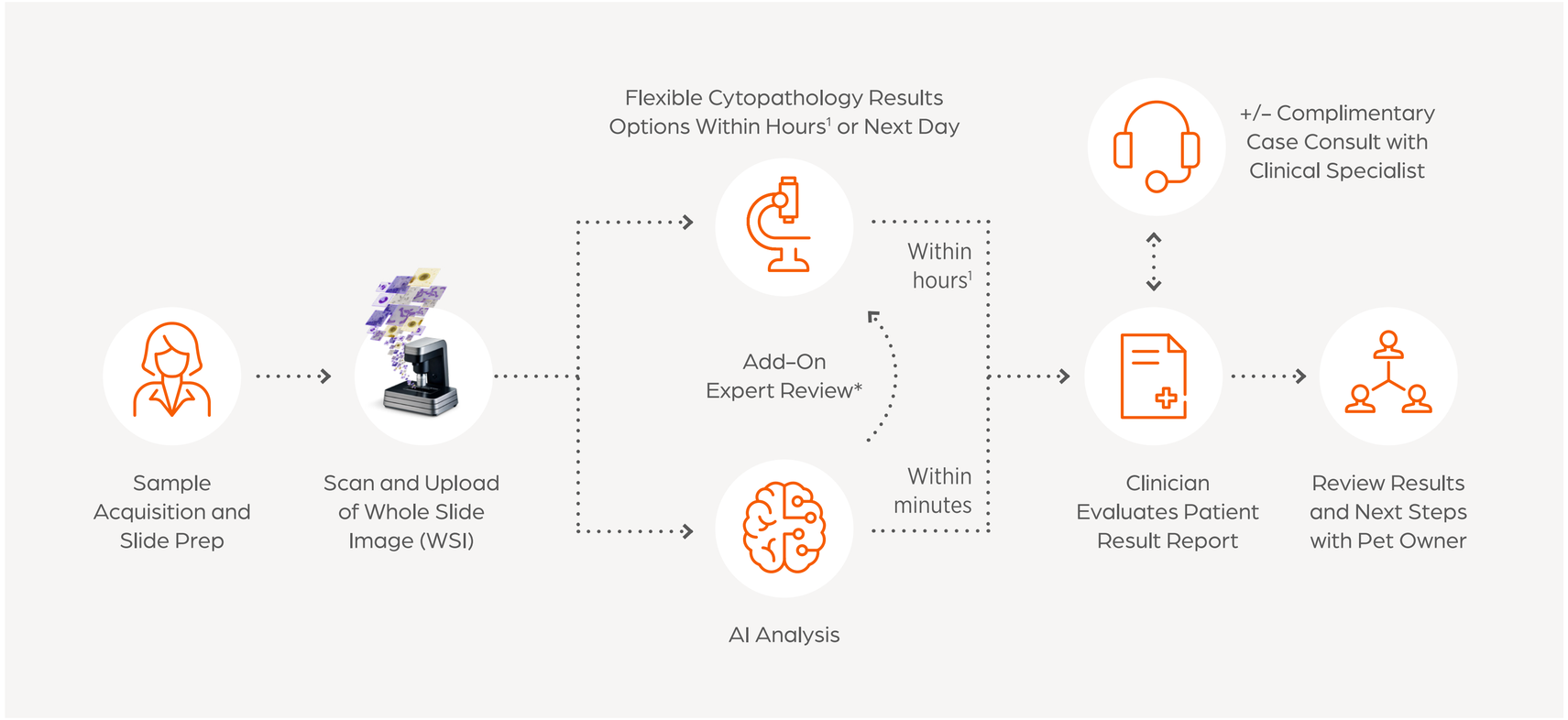
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How to Request Add-On Expert Review

If you would like an expert clinical pathologist to review any of your AI Masses tests, you can request an Add-on Expert Review.* For detailed instructions, see Section 6: Using Vetscan Imagyst AI Masses, Step 7.

Figure 7.2 *The Vetscan Imagyst Workflow*



*Add-on Expert Reviews are available for Vetscan Imagyst cases when clinically warranted. Option to send digital slide image to our network of clinical parasitologists or pathologists as needed. Additional costs may apply.

Reference: 1. Data on file, Study No. TI-11711 2024, Zoetis Inc.

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- In-Depth Cleaning: The Objective

Vetscan Imagyst Maintenance Guide

Routine Cleaning

Required Materials

Regular cleaning is vital to keeping your Vetscan Imagyst in good working order. It's important to follow the cleaning protocol and use only the recommended materials to avoid damaging the Vetscan Imagyst.

When cleaning the Vetscan Imagyst, you'll need the following materials:

Figure 8.1 *Vetscan Imagyst AI Masses Required Materials for Routine Cleaning*



Distilled water



Soft, damp, lint-free cloth



Isopropyl alcohol



Protective cloth



Microfiber cloth



Swab/foam tip

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Vetscan Imagyst Maintenance Guide

Step–by–Step Cleaning Instructions

Following are the steps in the cleaning protocol:

1. Power down the scanner by pressing the power button
2. Remove the power cable and the network cable from the scanner
3. Slide the topmost plate to the front
4. Wipe all surfaces with a soft, damp, lint-free cloth and distilled water. For in-depth cleaning, you can use a microscope cleaner or a solution of 70% isopropyl alcohol and 30% distilled water. (The Ocus® scanner has been tested with the Reagena™ microscope detergent)
5. Use a cleaning swab/foam tip with distilled water for cleaning the edges
6. Dry all surfaces with a soft, damp, lint-free cloth or Kimwipes™
7. Slide the topmost plate back to its normal position
8. Place a protective cloth on the glass beneath the objective
9. You can first try to clean the objective in place, using a microfiber cloth or lens paper. If necessary, try adding warm distilled water to the cloth or using a cleaning swab/foam tip with lukewarm distilled water

IMPORTANT: Never pour or spray any liquids directly on the scanner.

10. Connect the cables and switch the scanner on
11. If scans had been blurry prior to cleaning, complete the scan again and validate the images to verify appropriate cleanliness. Be sure that:
    - The overview camera produces good quality images
    - The live view from the microscope camera produces good quality images
    - Scanning of a known sample slide produces good quality images
12. If the quality is still poor, redo all steps and use isopropyl alcohol for the cleaning, and then follow the In-Depth Cleaning procedure (pg. 91) for the objective

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Vetscan Imagyst Maintenance Guide

In-Depth Cleaning: The Objective

Required Materials

Regular cleaning is vital to keeping your Vetscan Imagyst in good working order. It's important to follow the cleaning protocol and use only the recommended materials to avoid damaging the Vetscan Imagyst.

When cleaning the Vetscan Imagyst objective, you'll need the following materials:

Figure 8.1 *Vetscan Imagyst AI Masses Required Materials for In-Depth Cleaning*



Distilled water



Soft, damp, lint-free cloth



Bulb syringe



Protective cloth



Microfiber cloth



Swab/foam tip

*You can use a microscope cleaner or a solution of 70% isopropyl alcohol and 30% distilled water.

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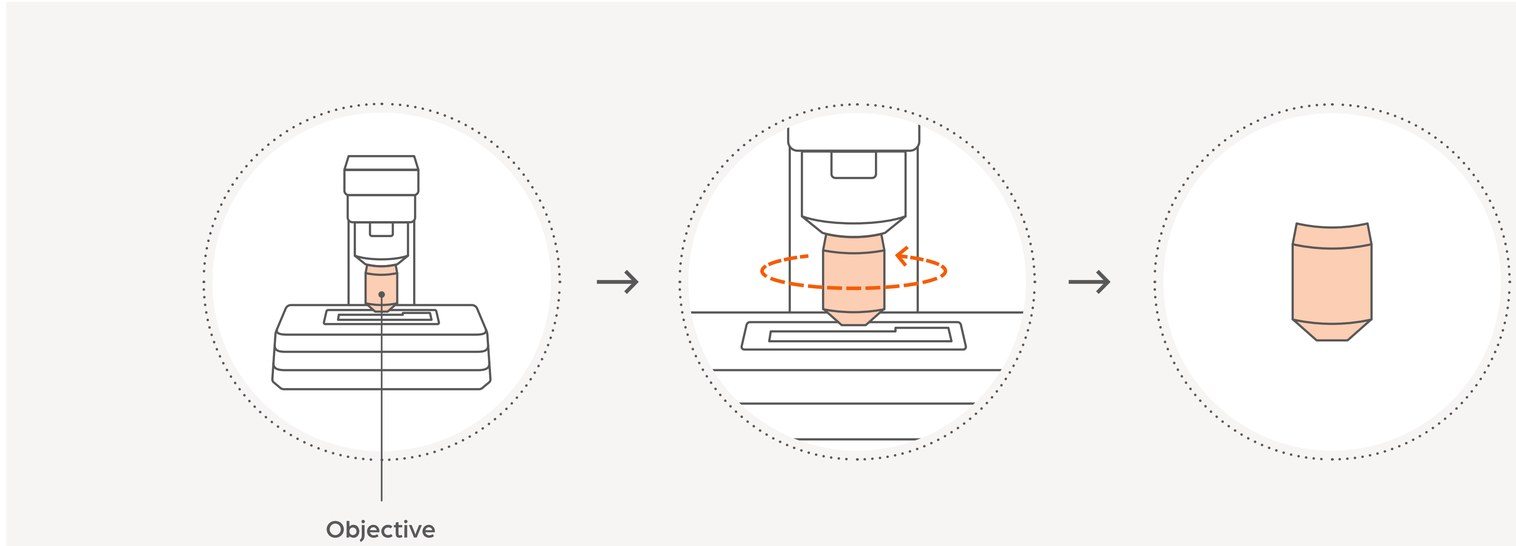
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In–Depth Cleaning Instructions

1. Power down the scanner by pressing the power button
2. Remove the power cable and the network cable from the scanner
3. Place a protective cloth on the glass beneath the objective
4. You can first try to clean the objective in place, using a microfiber cloth or lens paper. If necessary, try adding warm distilled water to the cloth or using a cleaning swab/foam tip with lukewarm distilled water

IMPORTANT: Never pour or spray any liquids directly on the scanner.

Figure 8.2 *How to Unscrew the Objective*



5. If the objective does not come clean, carefully unscrew it (See Figure 8.2)
6. Use the microfiber cloth and warm distilled water to clean the lens
7. Use a bulb syringe to remove any dust from the lens and scanner
8. Replace the objective by gently screwing it back in place
9. Remove the cloth covering the glass, replace the power and network cables and turn the scanner on
10. Check the scanner by running a test scan

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Tips for Success

Do

- Use warm distilled water, isopropyl alcohol or microscopic cleaning fluid to clean immersion oil from the lens
- Use isopropyl alcohol or isopropyl alcohol wipes sparingly
- Contact Diagnostic Technical Support for further help if needed

Do not

- Pour or spray any liquids directly on the scanner
- Use acetone or xylene to clean the lens, as they may damage it. However, if the lens is covered with glue/adhesive, cleaning the lens may require using stronger cleaners
- If removed, forcefully screw the objective back onto the scanner

For further guidance on analyzer maintenance, refer to the following videos:

- **How to Clean the Lens**
  https://www.youtube.com/watch?v=lOnEgSGD1Bw
- **How to Remove and Clean the Lens**
  https://www.youtube.com/watch?v=xDG_NG4Sk0U
- **How to Clean the Stage**
  https://www.youtube.com/watch?v=YkibYZ-59rY

LOOK DEEPER

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