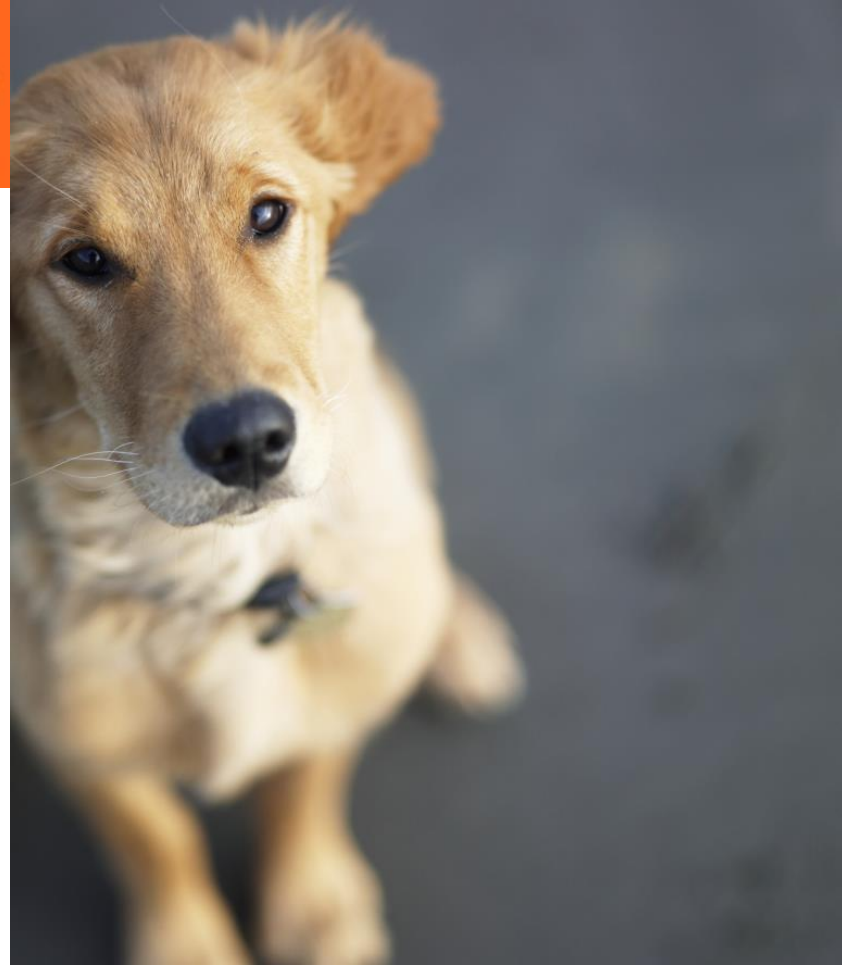




VETSCAN SA & VETSCAN UA CUSTOMER TRAINING

INSTALLATION TRAINING AGENDA

- 1 URINE SAMPLE HANDLING
- 2 URINE UA TESTING PROCEDURE
- 3 URINE SA TESTING PROCEDURE
- 4 SA/UA MAINTENANCE



URINE SAMPLE HANDLING: THE SAMPLE

- **Wear Gloves when handling urine (OSHA Compliance)¹**
- **Centrifuging sample is not required or recommended**
- **1.0mL* of sample required in a clear, clean, sterile, additive free container**

***0.65mL used for SA run, additional volume for UA to also be run¹**

URINE SAMPLE HANDLING: COLLECTION



COLLECTION METHODS^{2,3,4}

- Voided/Free Catch
- Catheterized
- Cystocentesis

2. Chew, Dennis and DiBartola, Stephen, Interpretation of Canine and Feline Urinalysis. 2004
3. SinkCA and Weinstein NM. , Practical Veterinary Urinalysis. Ames, IA: John Wiley & Sons Inc. 2012, pgs. 9-18.
4. SinkCA and Feldman BF. , Laboratory Urinalysis and Hematology for the Small Animal Practitioner. 2004. pgs. 3-18.

SAMPLE HANDLING: COLLECTION VARIABILITY

Voided/free catch

Often contain contaminants lower urinary tract:⁵

- Bacteria

- Epithelial cells

- Sperm

- Blood

Catheterized

Blood or lower urinary contaminants

Cystocentesis

Sterile needle/syringe used to externally collect urine

Blind vs. ultrasound guidance

Can have small amount of blood contamination

URINE SAMPLE HANDLING: STORAGE AND PRESERVATION

SAMPLE STORAGE

- After collection, urine samples should be transferred to a clean, sterile container⁴
 - Containers should not be reused, even if washed³
- Should use a clear container so that physical properties can be evaluated³

SAMPLE PRESERVATION

- The full urinalysis should be performed within 30 minutes to 1 hour after collection^{3,4}
- If a delay in testing will be encountered, it can be placed in the refrigerator for up to 4 hours⁴
 - Decreases bacterial growth
 - Can lead to increased specific gravity and precipitation of amorphous crystals

3. SinkCA and Weinstein NM. Practical Veterinary Urinalysis. Ames, IA: John Wiley & Sons Inc. 2012.

4. SinkCA and Feldman BF. Laboratory Urinalysis and Hematology for the Small Animal Practitioner. 2004

SAMPLE HANDLING: POINT-OF-CARE IS BEST

Results can differ between fresh sample and following storage and transport.

Delay at room temperature can result in:⁵

- Degradation of bilirubin, ketones
- Increased urine pH
- Bacterial proliferation
- Degradation of cells/casts
- Loss of cellular detail

Refrigeration for several hours leads to:

- Precipitation of crystals
- Increased USG

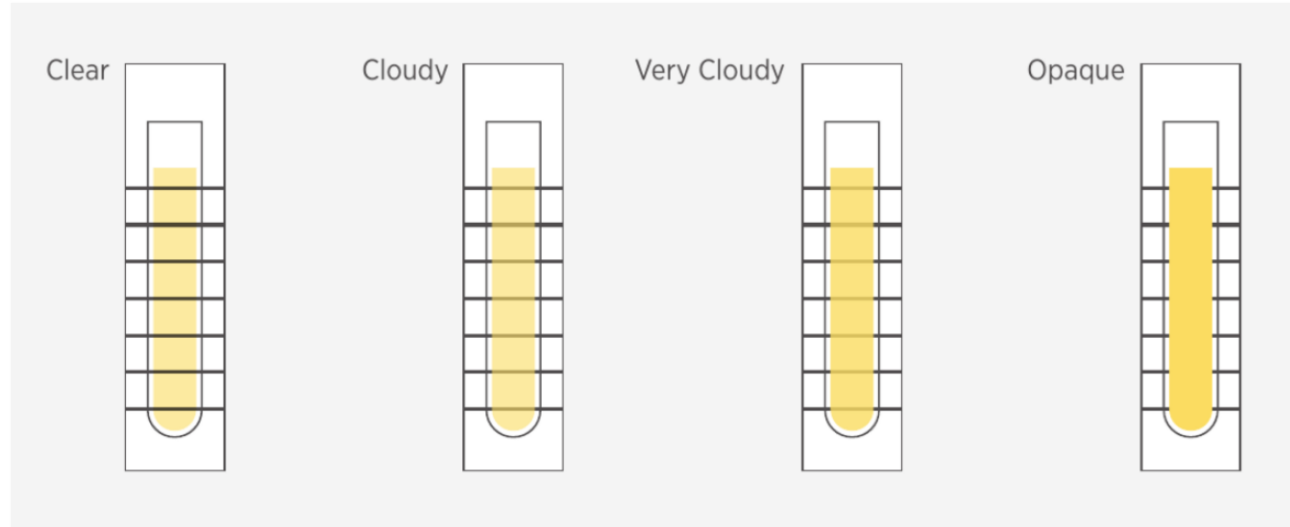
Improper sample handling can lead to:

- False positive bacteria

Record:
Time of collection,
collection method,
and method of storage

SAMPLE PROCESSING PHYSICAL PROPERTIES³

- Urine Color
- Urine Clarity
- Urine Odor
- Urine Specific Gravity



PHYSICAL URINE PROPERTIES

URINE COLOR

- Normal urine color – yellow⁶
- Pigmenturia – abnormal urine color⁶
 - Can result from normal metabolic conditions, pathological conditions, physical exertion, or drug administration
 - Example: Red urine can be caused by red blood cells in the urine (hematuria), hemoglobin in the urine (hemoglobinuria), or myoglobin in the urine (myoglobinuria)⁶

URINE CLARITY

- Pertains to the transparency or turbidity of a urine sample⁶
- Should be evaluated through a clear specimen container³
- Normal urine is generally clear, however, can become cloudy over time³
- If turbid urine is collected, the cause should be identified with sediment analysis of the urine³

SAMPLE HANDLING: URINE SPECIFIC GRAVITY (USG)

- Evaluation of specific gravity is essential when interpreting a complete urinalysis
- ***Refractometry is the easiest and most common way to obtain USG⁶***
- USG obtained with any reagent test strip is semi-quantitative and unreliable in veterinary medicine³



URINE TESTING PROCEDURES UA AND SA

- On Screen Instructions
- Sample Fields
- How To Run The Samples
- Hand Out Materials
- Review Images

TESTING: VETSCAN UA URINE ANALYZER



14 Analytes

- Ketone
 - Nitrite
 - Urobilinogen
 - Bilirubin
 - Glucose
 - Protein
 - Leukocytes
 - Specific Gravity
 - pH
 - Blood
 - Ascorbic Acid
 - Microalbumin
 - Calcium
 - Creatinine
 - Urine Protein:Creatinine Ratio (UPC)
- UA14 strip only

Complete urinalysis report
in a few steps



TESTING: VETSCAN UA URINE ANALYZER

UA 10 STRIP ANALYTES⁷

- Leukocytes
- **Ketones**
- Nitrite
- Urobilinogen
- **Bilirubin**
- **Glucose**
- **Protein**
- Specific Gravity
- pH
- Occult blood

UA 14 STRIP ANALYTES⁸

- UA 10 analytes +
- **Microalbumin**
- Calcium
- Ascorbic Acid
- **Urine Protein:Creatinine Ratio**

Bold parameters are veterinary relevant urine chemistry analytes

7. VetScan UA10 Urine Test Strips Legacy Abaxis Direction Insert (v1.0) - Strip analytes (p.1)

8. VetScan UA14 Urine Test Strips Legacy Abaxis Direction Insert (v1.0) - Strip analytes (p.1)

TESTING: AVAILABLE URINE CHEMISTRY TESTS

RELIABLE VETERINARY TESTS³

- Occult Blood
- Glucose
- Ketones
- Bilirubin
- pH
- Protein

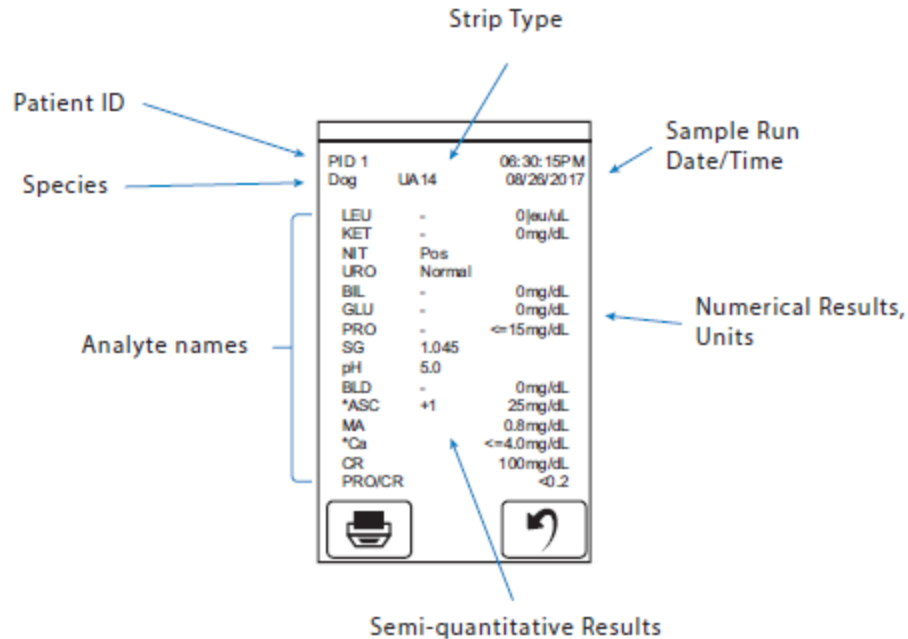


UNRELIABLE VETERINARY TESTS³

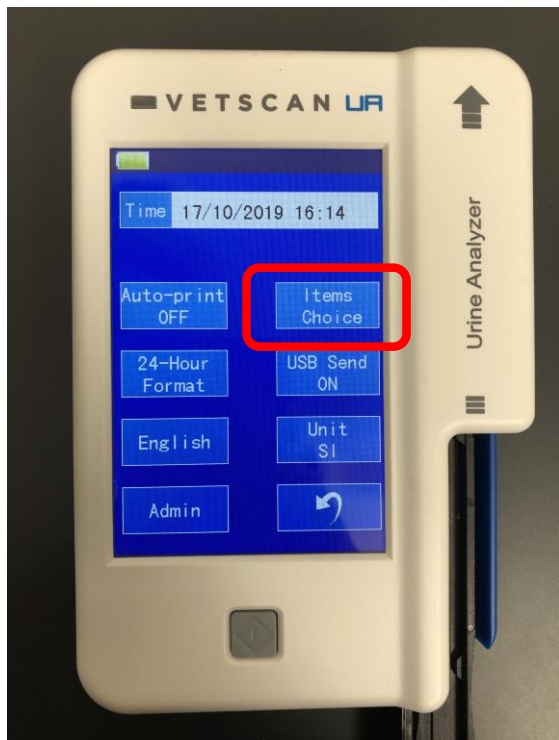
- Specific Gravity
- Nitrite
- Leukocytes (WBC)
- Ascorbic Acid
- Calcium
- Urobilinogen

TESTING: VETSCAN UA URINE ANALYZER

VETSCAN UA RESULTS



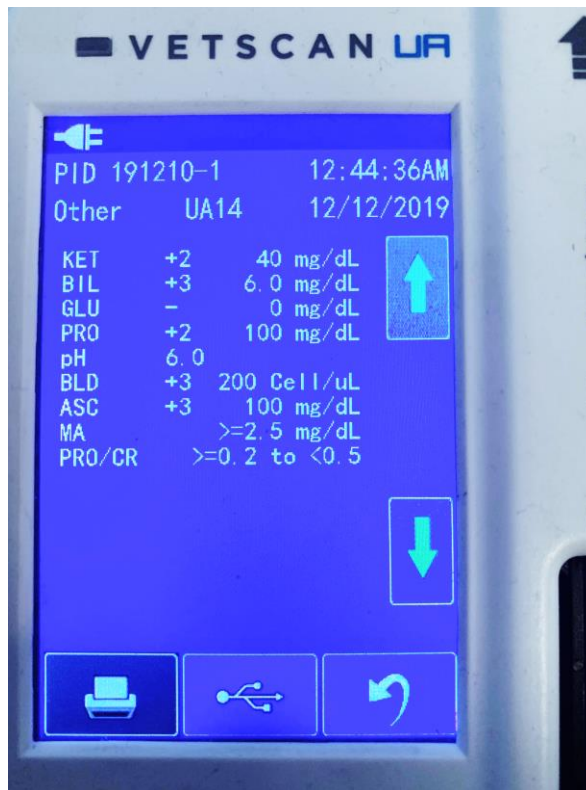
Toggle Test Parameters



Default Test Parameters



Display with Parameters Toggled Off



TESTING: URINE PROTEIN

POSITIVE PROTEIN REACTION

The UA 14 strip has semi-quantitative:

- Microalbuminuria (MA)
- Urine protein: creatinine ratio (UPC)

Both semi-quantitative MA and UPC available only on a POC urine reagent strip for the VETSCAN UA

TESTING: MICROALBUMIN (MA)

- Microalbuminuria is the presence of albumin below the detectable limit on the standard strip
 - Most sensitive indicator of protein loss in the urine⁹
- Repeatable increased MA may indicate early kidney disease³
 - Renal Proteinuria⁹
 - 3 MA elevations (>2.5 mg/dL) - 2 weeks apart⁹
 - Persistent MA with normal sediment exam and no other disease is significant.
 - Non-specific
 - Can also be due to systemic (non-kidney disease)

3. Sink CA and Weinstein NM. Practical Veterinary Urinalysis. Ames, IA: John Wiley & Sons Inc. 2012. pgs 113-132.
9. Lees GE, et al., *J Vet Intern Med* 2005; (v2.0). Pgs 19, 377-385

TESTING: MICROALBUMINURIA TESTING

RECOMMENDED TIMES FOR MICROALBUMINURIA TESTING:⁹

- In ill patients where results of conventional evaluations for proteinuria are negative
- Screening for senior pets
 - Dogs ≥ 6 years old
 - Cats ≥ 8 years old
- Patients at risk of early renal disease (hereditary nephropathy)
- Chronic illness that may be complicated by kidney damage or disease

TESTING: URINE PROTEIN:CREATININE (UPC) RATIO

- Customary test to confirm and/or stage proteinuria³
- Value is standardized by utilizing creatinine as part of the calculation¹⁰
- Must be evaluated in the presence of an inactive urine sediment



TESTING: VETSCAN UA SIMPLE OPERATION¹

Simple Operation



Start test



Apply urine to strip, then place strip on holder



Read results

VETSCAN SA SEDIMENT ANALYZER



TESTING: VETSCAN SA SEDIMENT ANALYZER¹

10 Classified Urinary Elements

Blood Cells

- 1 Red Blood Cells
- 2 White Blood Cells

Bacteria

- 3 Bacteria Rods
- 4 Bacteria Cocci

Epithelial Cells

- 5 Squamous Epithelial Cells
- 6 Non-squamous Epithelial Cells

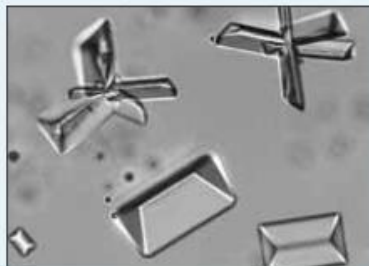
Casts

- 7 Hyaline Casts
- 8 Non-hyaline Casts

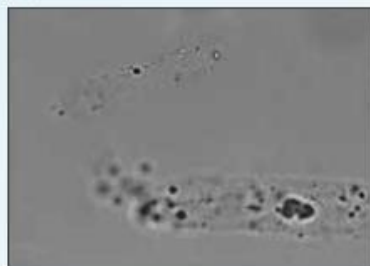
Crystals

- 9 Calcium Oxalate Crystals
- 10 Struvite Crystals

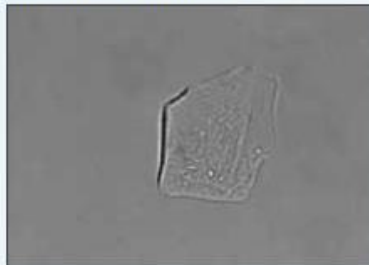
Struvite Crystals



Hyaline Casts



Squamous Epithelial Cells



Non-Squamous Epithelial Cells



1. Zoetis, Inc. (2018). Vetscan SA User's Manual.

TESTING: VETSCAN SA SEDIMENT ANALYZER

Identifies the common parameters found in urine sediment:

QUANTITATIVE

- Red Blood Cells
- White Blood Cells
- Epithelial Cells
 - Squamous
 - Non-squamous
- Casts
 - Hyaline
 - Non-hyaline

SEMIQUANTITATIVE

- Bacteria (SQ)
 - Rods
 - Cocci
- Crystals (SQ)
 - Struvite
 - Calcium Oxalate

VETSCAN SA Image Recognition Process

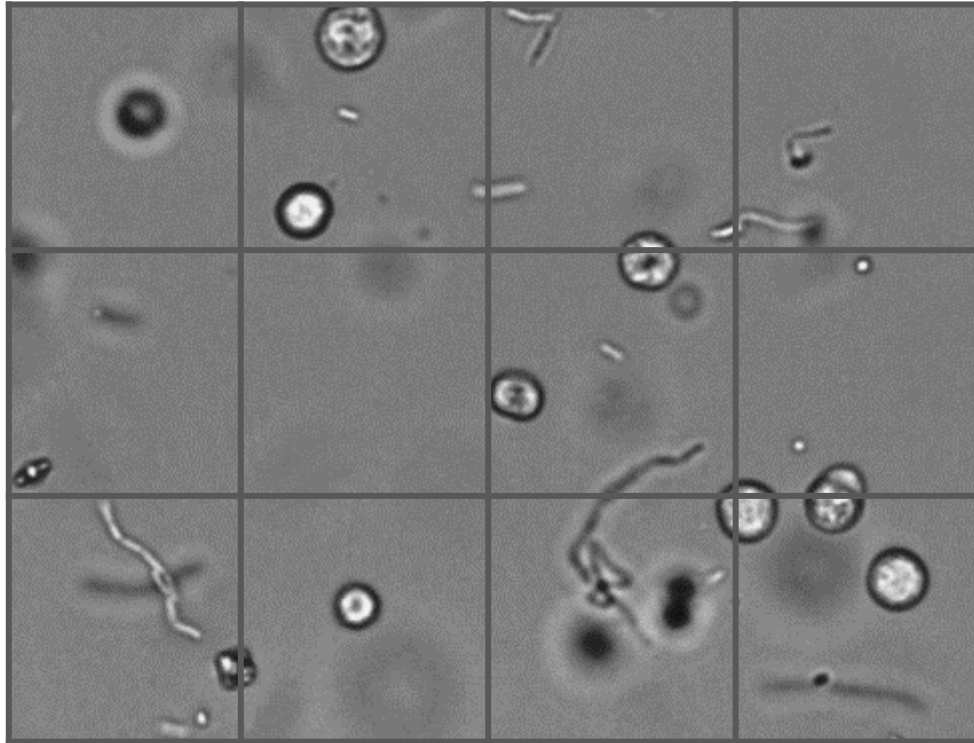
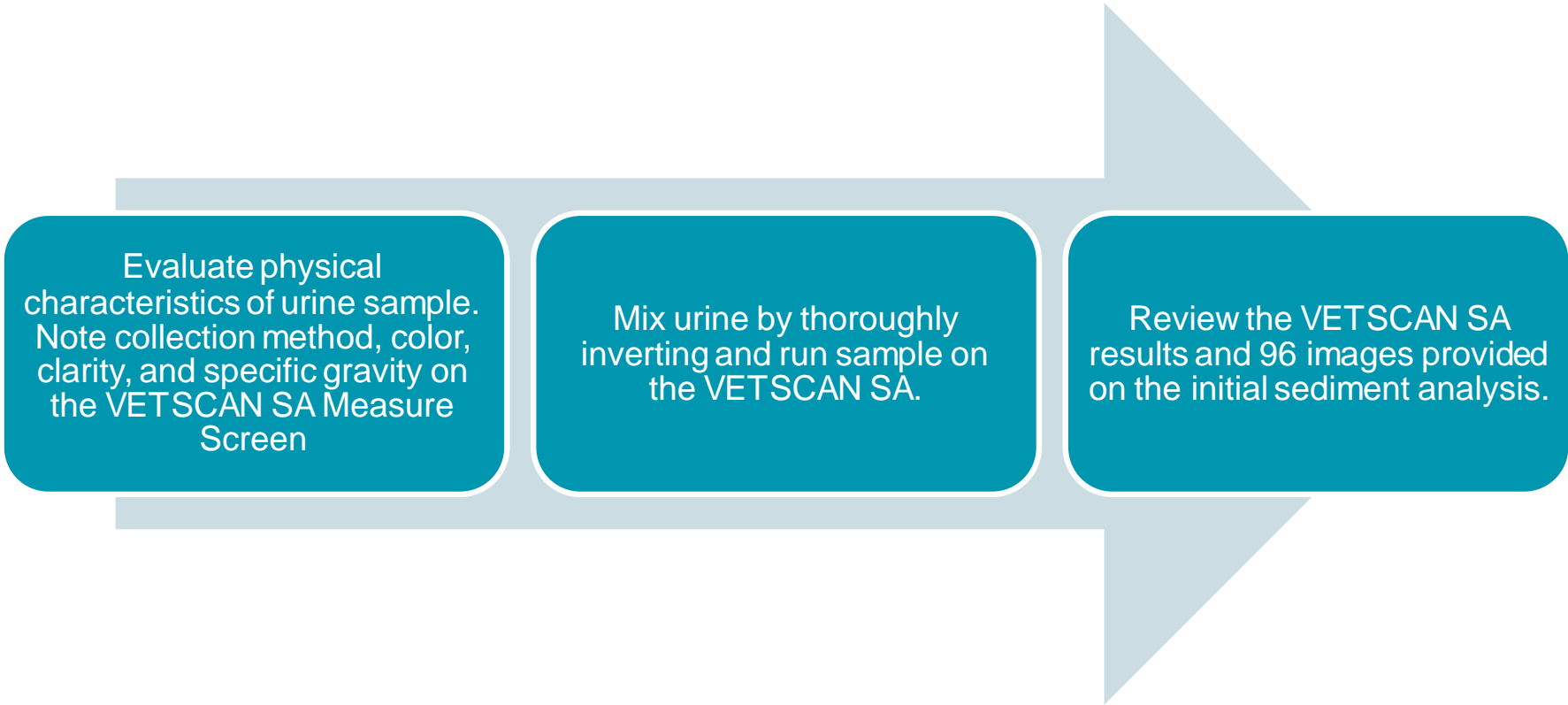


Image is representative of a 40x objective field of view. Image is taken from the VETSCAN SA.

VETSCAN SA Workflow¹



Evaluate physical characteristics of urine sample. Note collection method, color, clarity, and specific gravity on the VETSCAN SA Measure Screen

Mix urine by thoroughly inverting and run sample on the VETSCAN SA.

Review the VETSCAN SA results and 96 images provided on the initial sediment analysis.

TESTING: VETSCAN SA SIMPLE OPERATION¹

Measure Database Tools 10-07-2019 10:33:38

Select Work List job or Enter PID and Species.
Enter additional information: Collection Method, Color, Clarity and Specific Gravity.
Confirm or Select Test Type.
Click Run.

40X x4 x16 1/0

Patient ID 1234
Species Dog
Patient Name fido
Doctor Smith
Collection Method Cystocentesis
Color
Clarity
Specific Gravity
Dilution
Comments
Test Type

Run

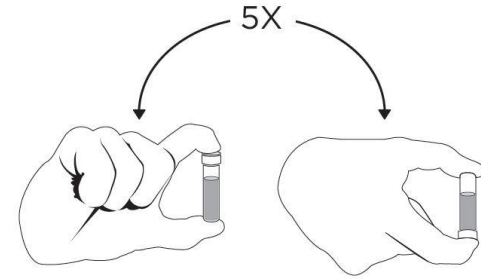
SA Test Results:

Parameter	Value	Unit
RBC		
WBC		
Sq Epithelial		
Non Sq Epithelial		
Hyaline		
Non Hyaline		
Bacteria-Rods		
Bacteria-Cocci		
Struvite		
CaOx dihydrate		
NTR=None to Rare		

UA

Parameter	Value(Unit)
Ketones	
Nitrites	
Urobilinogen	
Bilirubin	
Glucose	
Protein	
pH	
Blood	
Ascorbic Acid	
Microalbumin	
Calcium	
Creatinine	
Protein/Creatinine	

Network: Off



1. Zoetis, (2020). VETSCAN SA User's Manual

TESTING: VETSCAN SA RESULTS REVIEW¹



- Review all images
- Dilutions may be needed with very active sediment
- May need slide/pathology to confirm results

TESTING: VETSCAN SA RESULTS¹

01-20-20 08:15:31

Time stamp for when report was printed

Patient and Doctor info → Patient ID: 1234
Species: Dog
Patient Name: Fido
Doctor: Smith

Physical characteristics of sample and specific gravity → Test Type: SA+UA14
Collection Method: Cystocentesis
Color: Yellow-orange
Clarity: Slightly turbid
Specific Gravity: 1.027

VETSCAN SA results →

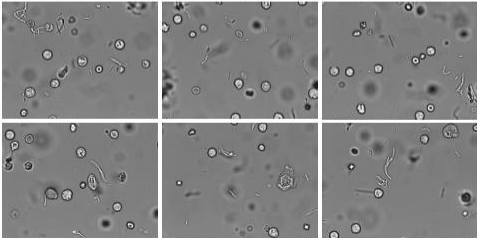
VETSCAN SA			VETSCAN UA		
Urine sediment results			Urine chemistry results		
SA SN: SA00063	SW: V1.2.0		UA SN: UA00037	SW: V1.2.0	
Reagent Kit Lot: 63180020					
Time: 01-20-2020 08:15:31			Time: 01-20-2020 08:12:09		
Test	Result	Units	Test	Result (Units)	
RBC	260	/uL	Ketones	-	0 mg/dL
WBC	271	/uL	Nitrites	-	
Sq Epithelial	1	/uL	Urobilinogen	+1	2.0 mg/dL
Non Sq Epithelial	NTR	/uL	Bilirubin	+1	0.5 mg/dL
Hyaline	NTR	/uL	Glucose	-	0 mg/dL
Non Hyaline	NTR	/uL	Protein	+3	300 mg/dL
Bacteria-Rods	++		pH	6.5	
Bacteria-Cocci	NTR		Blood	+3	200 Cell/uL
Struvite	NTR		Ascorbic Acid	+3	100 mg/dL
CaOx dihydrate	+		Microalbumin	>=2.5	mg/dL
Dilution:	N/A		Calcium	<=4.0	mg/dL
SA Test Results: Review Images - Multiple			Creatinine	>=300	mg/dL
Elements Suspected			Protein/Creatinine	>=2.0	
NTR = None To Rare					
Comments:					
Test run by AR					

VETSCAN UA results

Dilution ratio →

VETSCAN SA Warning →

VETSCAN SA images






**WHAT HAPPENS IF AN
ELEMENT CANNOT BE
CLASSIFIED INTO A
CATEGORY?**


SA Review Images


Review Images


5 Possible SA Warnings can appear:


- (1) Review images – Bacteria Suspected
- (2) Review images – Unclassified Elements Present
- (3) Review images – Multiple Elements Suspected
- (4) TNTC – Dilute and retest
- (5) Possible short sample

SA Test Results: Review Images - Unclassified Elements Present		
SA	10-17-2019 6:13:09 PM	
Parameter	Value	Unit
RBC	24	/uL
WBC	16	/uL
Sq Epithelial	1	/uL
Non Sq Epithelial	NTR	/uL
Hyaline	NTR	/uL
Non Hyaline	NTR	/uL
Bacteria-Rods	NTR	
Bacteria-Cocci	NTR	
Struvite	NTR	
CaOx dihydrate	NTR	
NTR=None to Rare		

SA Test Results: Review Images - Bacteria Suspected		
SA	01-24-2020 16:58:26	
Parameter	Value	Unit
RBC	223	/uL
WBC	221	/uL
Sq Epithelial	NTR	/uL
Non Sq Epithelial	NTR	/uL
Hyaline	NTR	/uL
Non Hyaline	NTR	/uL
Bacteria-Rods	NTR	
Bacteria-Cocci	+	
Struvite	NTR	
CaOx dihydrate	NTR	
NTR=None to Rare		

SA Test Results: Review Images - Multiple Elements Suspected		
SA	10-17-2019 6:20:16 PM	
Parameter	Value	Unit
RBC	396	/uL
WBC	66	/uL
Sq Epithelial	NTR	/uL
Non Sq Epithelial	NTR	/uL
Hyaline	NTR	/uL
Non Hyaline	NTR	/uL
Bacteria-Rods	+	
Bacteria-Cocci	+	
Struvite	+	
CaOx dihydrate	NTR	
NTR=None to Rare		

SA Test Results: Possible short sample		
SA	15-01-2020 10:49:23	
Parameter	Value	Unit
RBC	56	/uL
WBC	37	/uL
Sq Epithelial	NTR	/uL
Non Sq Epithelial	NTR	/uL
Hyaline	NTR	/uL
Non Hyaline	NTR	/uL
Bacteria-Rods	NTR	
Bacteria-Cocci	NTR	
Struvite	NTR	
CaOx dihydrate	NTR	
NTR=None to Rare		

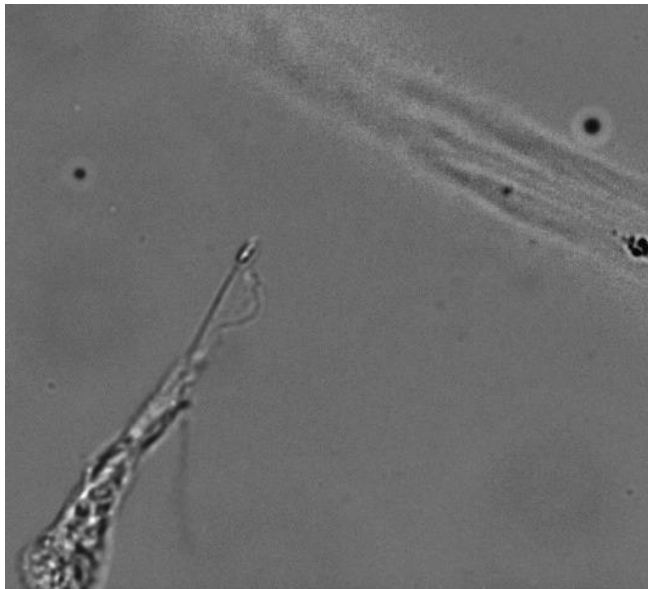
SA Test Results: TNTC - Dilute and retest		
SA	23-01-2020 16:29:42	
Parameter	Value	Unit
RBC	~~~	/uL
WBC	~~~	/uL
Sq Epithelial	~~~	/uL
Non Sq Epithelial	~~~	/uL
Hyaline	~~~	/uL
Non Hyaline	~~~	/uL
Bacteria-Rods	~~~	
Bacteria-Cocci	~~~	
Struvite	~~~	
CaOx dihydrate	~~~	
NTR=None to Rare		

SA Test Results- Review Images Unclassified Elements Present

Recommended Action: Perform Manual Sediment Review

Threshold of unclassified elements is exceeded

- Review images for abnormal cells/elements of significance.
- Warning may be due to contaminants or elements outside of the analyzer's classifications.



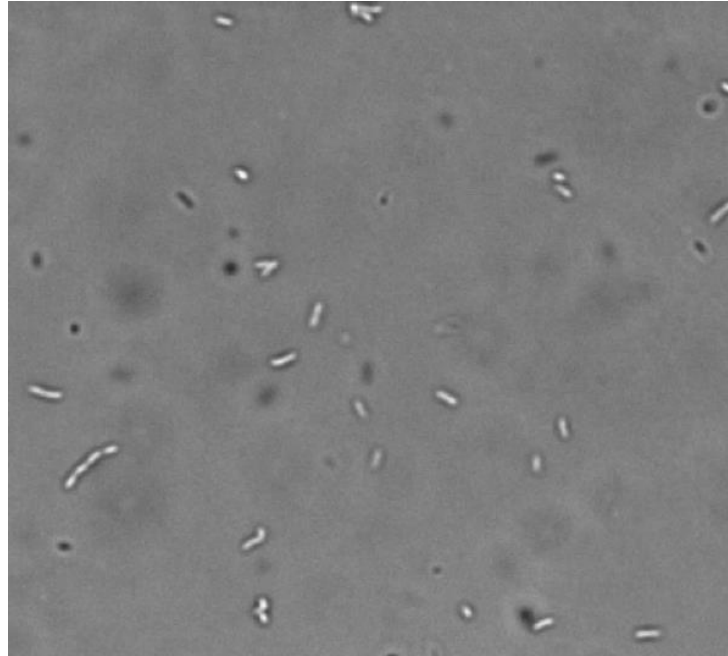
SA Test Results- Review Images

Bacteria Suspected

Recommended Action: perform an air-dried stained sediment smear and/or send out for culture and sensitivity.

Bacteria results + to ++++

- Bacteria shapes and chains vary greatly from image to image and can be confused with contaminants.
- Review images and interpret results in conjunction with patient history and clinical signs.

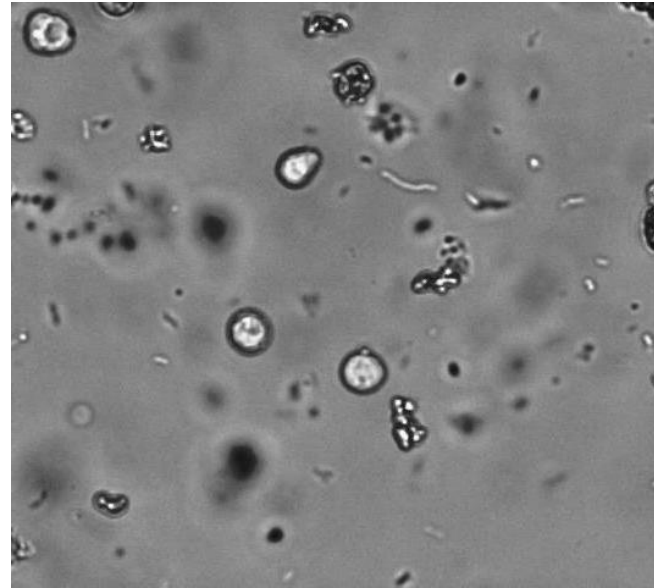


SA Test Results- Review Images

Multiple Elements Suspected

Recommended Action: Perform manual sediment review using desired lab, send out for culture and sensitivity, and/or perform dilution if images do not provide clinically actionable information.

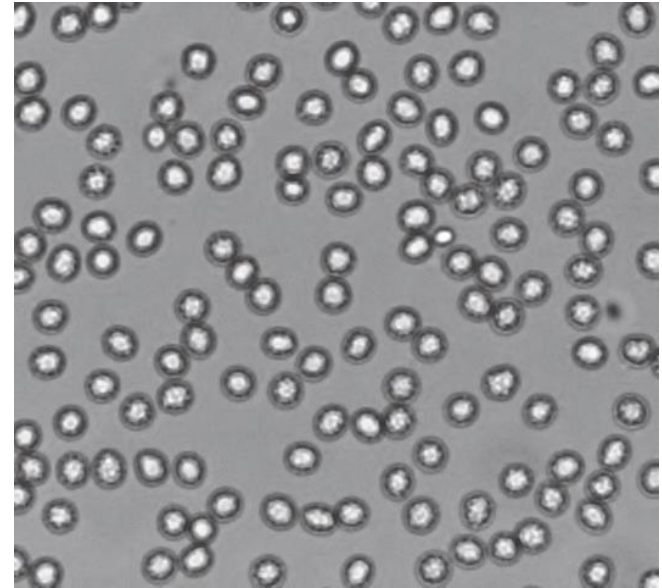
- Threshold of unclassified elements exceeded and Bacteria results + to ++++
- OR, RBC > 500/ μ L * \pm Bacteria results + to ++++
- \pm Threshold of unclassified elements exceeded
- Review images to determine further actions.



SA Test Results- TNTC Warning

Recommended Action: If clinically actionable information cannot be identified, dilute and re-test. See dilution recommendations in VETSCAN SA Analyzer manual for guidelines.

- If many cells or other elements are present in the sample; this could result in an overlap of elements, and the analyzer may be unable to focus
- Images provided may still provide clinically actionable information, although quantitative or semi-quantitative results may be unavailable.

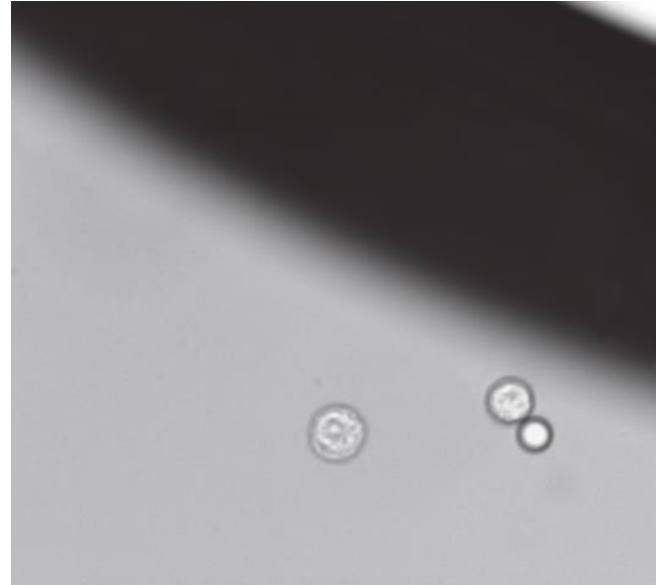


SA Test Results- Short Sample Warning

Recommended Action: If clinically actionable information cannot be identified, dilute and re-test. See dilution recommendations in VETSCAN SA Analyzer manual for guidelines.

Not enough sample was aspirated for analysis

- In some cases, clinically relevant images may still be reviewed and no re-test is necessary.
- If air bubbles and/or air-water interface are seen (see image right), re-test the sample.



SA Test Results Display Text

SA Test Results display text:	Description	Action
Completed	Nothing abnormal or questionable	Review images
Review Images - Unclassified Elements Present	SA detected abnormal levels of undefined elements	Review images; review on manual slide and/or confirm with send-out laboratory
Review Images—Bacteria Suspected	SA detected presence of bacteria	Review images +/- urine culture sensitivity, and/or dry prep and interpreted in conjunction with patient history and clinical signs
Review Images - Multiple Elements Suspected	Any of the following 5 scenarios: 1. RBC > 500/ μ L 2. RBC > 500/ μ L & abnormal levels of undefined sediment 3. RBC > 500/ μ L & detected presence of bacteria 4. RBC > 500/ μ L & abnormal levels of undefined sediment & detected presence of bacteria 5. abnormal levels of undefined sediment & detected presence of bacteria	Review on manual slide and/or confirm with send-out laboratory
TNTC - Dilute and retest	Too numerous to count; too many particles in image; sample dilution may be required.	Review images provided to determine if pathology can be determined without dilution. If this is not possible, the sample should be diluted to Lowest dilution ratio and rerun.
Possible short sample	SA may not have received enough sample to complete test	Retest and ensure sample probe touches tube bottom.
Not measured	UA only test selected	None



Measure



Database



Tools

10-07-2019 10:47:49

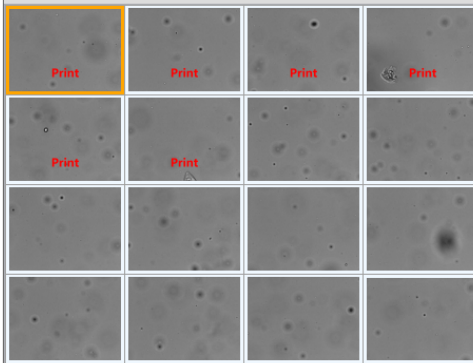


Click Save to store current SA Test Results, or click Retest to rerun same test.

40X

☐ x4☒ x16

1/96



Patient ID 1234 *

Species Dog *

Patient Name fido

Doctor Smith

Collection Method Cystocentesis

Color Yellow-orange

Clarity Slightly turbid

Specific Gravity 1.027

Dilution Undiluted

Comments

Test Type SA+UA14 *

SA Test Results:
Completed

SA	10-07-2019 10:47:39	
Parameter	Value	Unit
RBC	NTR	/uL
WBC	NTR	/uL
Sq Epithelial	NTR	/uL
Non Sq Epithelial	NTR	/uL
Hyaline	NTR	/uL
Non Hyaline	NTR	/uL
Bacteria-Rods	NTR	
Bacteria-Cocci	NTR	
Struvite	NTR	
CaOx dihydrate	NTR	

NTR=None to Rare

UA 1234

10-07-2019 10:47:39

Parameter	Value(Unit)
Ketones	- 0 mg/dL
Nitrites	-
Urobilinogen	+1 2.0 mg/dL
Bilirubin	+1 0.5 mg/dL
Glucose	- 0 mg/dL
Protein	+1 30 mg/dL
pH	6.0
Blood	- 0 Cell/uL
Ascorbic Acid	+3 100 mg/dL
Microalbumin	>=2.5 mg/dL
Calcium	<=4.0 mg/dL
Creatinine	>=300 mg/dL
Protein/Creatinine	<0.2

New

Save

Print...

Retest

Network: Off

zoetis



Measure



Database

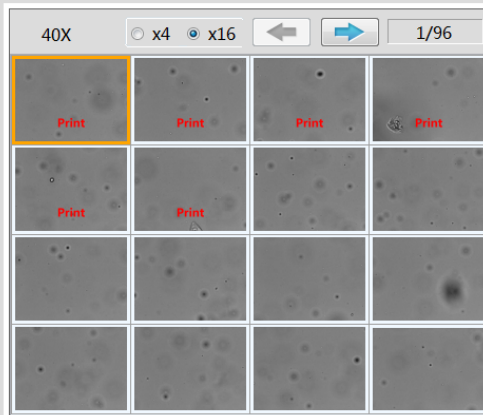


Tools

10-07-2019 10:47:49



Click Save to store current SA Test Results, or click Retest to rerun same test.



Patient ID *

Species *

Patient Name

Doctor

Collection Method

Color

Clarity

Specific Gravity

Dilution

Comments

Test Type *

SA Test Results:
Completed

SA	10-07-2019 10:47:39	
Parameter	Value	Unit
RBC	NTR	/uL
WBC	NTR	/uL
Sq Epithelial	NTR	/uL
Non Sq Epithelial	NTR	/uL
Hyaline	NTR	/uL
Non Hyaline	NTR	/uL
Bacteria-Rods	NTR	
Bacteria-Cocci	NTR	
Struvite	NTR	
CaOx dihydrate	NTR	

NTR=None to Rare

UA	1234	
10-07-2019 10:47:39		
Parameter	Value	(Unit)
Ketones	-	0 mg/dL
Nitrites	-	
Urobilinogen	+1	2.0 mg/dL
Bilirubin	+1	0.5 mg/dL
Glucose	-	0 mg/dL
Protein	+1	30 mg/dL
pH	6.0	
Blood	-	0 Cell/uL
Ascorbic Acid	+3	100 mg/dL
Microalbumin	>=2.5	mg/dL
Calcium	<=4.0	mg/dL
Creatinine	>=300	mg/dL
Protein/Creatinine	<0.2	

New

Save

Print...

Retest

Network: Off



Measure



Database



Tools

10-07-2019 10:54:26



Click New to run next test.

Saving
establishes
the test
results as a
patient
record.

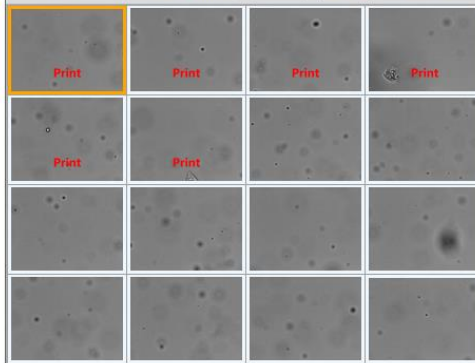
40X

x4

x16



1/96



Patient ID 1234 *

Species Dog *

Patient Name fido

Doctor Smith

Collection Method Cystocentesis

Color Yellow-orange

Clarity Slightly turbid

Specific Gravity 1.027

Dilution Undiluted

Comments AR ran test

Test Type SA+UA14 *

SA Test Results:
Completed

SA	10-07-2019 10:47:39	
Parameter	Value	Unit
RBC	NTR	/uL
WBC	NTR	/uL
Sq Epithelial	NTR	/uL
Non Sq Epithelial	NTR	/uL
Hyaline	NTR	/uL
Non Hyaline	NTR	/uL
Bacteria-Rods	NTR	
Bacteria-Cocci	NTR	
Struvite	NTR	
CaOx dihydrate	NTR	

NTR=None to Rare

UA 1234

10-07-2019 10:47:39

Parameter	Value	Unit
Ketones	-	0 mg/dL
Nitrites	-	
Urobilinogen	+1	2.0 mg/dL
Bilirubin	+1	0.5 mg/dL
Glucose	-	0 mg/dL
Protein	+1	30 mg/dL
pH	6.0	
Blood	-	0 Cell/uL
Ascorbic Acid	+3	100 mg/dL
Microalbumin	>=2.5	mg/dL
Calcium	<=4.0	mg/dL
Creatinine	>=300	mg/dL
Protein/Creatinine	<0.2	

New

Save

Print...

Retest

Network: Off

zoetis



Measure



Database

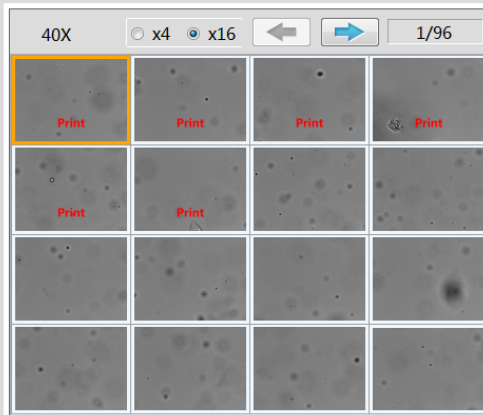


Tools

10-07-2019 10:47:49



Click Save to store current SA Test Results, or click Retest to rerun same test.



Patient ID 1234 *

Species Dog *

Patient Name fido

Doctor Smith

Collection Method Cystocentesis

Color Yellow-orange

Clarity Slightly turbid

Specific Gravity 1.027

Dilution Undiluted

Comments

Test Type SA+UA14 *

SA Test Results: Completed

SA	10-07-2019 10:47:39	
Parameter	Value	Unit
RBC	NTR	/uL
WBC	NTR	/uL
Sq Epithelial	NTR	/uL
Non Sq Epithelial	NTR	/uL
Hyaline	NTR	/uL
Non Hyaline	NTR	/uL
Bacteria-Rods	NTR	
Bacteria-Cocci	NTR	
Struvite	NTR	
CaOx dihydrate	NTR	

NTR=None to Rare

UA 1234	10-07-2019 10:47:39	
Parameter	Value	Unit
Ketones	-	0 mg/dL
Nitrites	-	
Urobilinogen	+1	2.0 mg/dL
Bilirubin	+1	0.5 mg/dL
Glucose	-	0 mg/dL
Protein	+1	30 mg/dL
pH	6.0	
Blood	-	0 Cell/uL
Ascorbic Acid	+3	100 mg/dL
Microalbumin	>=2.5	mg/dL
Calcium	<=4.0	mg/dL
Creatinine	>=300	mg/dL
Protein/Creatinine	<0.2	

New

Save

Print...

Retest

Network: Off

SA Confirm Results and Retest Options

Confirm information.
Click Run to Retest.

40X x4 x16 1/0

Patient ID 1234
Species Dog
Patient Name fido
Doctor Smith
Collection Method Cystocentesis
Color Yellow-orange
Clarity Slightly turbid
Specific Gravity 1.027
Dilution Undiluted
Comments
Test Type SA+UA14

SA Test Results:

Parameter	Value	Unit
RBC		
WBC		
Sq Epithelial		
Non Sq Epithelial		
Hyaline		
Non Hyaline		
Bacteria-Rods		
Bacteria-Cocci		
Struvite		
CaOx dihydrate		
NTR=None to Rare		
UA		

Parameter	Value(Unit)
Ketones	- 0 mg/dL
Nitrites	N/A
Urobilinogen	N/A
Bilirubin	- 0 mg/dL
Glucose	+1 100 mg/dL
Protein	- <15 mg/dL
pH	5.0
Blood	- 0 Cell/uL
Ascorbic Acid	+3 100 mg/dL
Microalbumin	<2.5 mg/dL
Calcium	N/A
Creatinine	N/A
Protein/Creatinine	<0.2

Cancel Run

Network: Connected

All patient and sample entry is saved.

Patient ID, Species, and Test Type are locked.

UA results (if test run) will be saved and displayed with the new SA test values.

Click Run to start SA test again.

DILUTIONS ON THE VETSCAN SA

WHY DILUTIONS ARE SOMETIMES NEEDED

VETSCAN SA Technology

- Identifies individual elements that are not grouped together or stacked
- The presence of large amounts of debris or cellularity, may make a dilution necessary

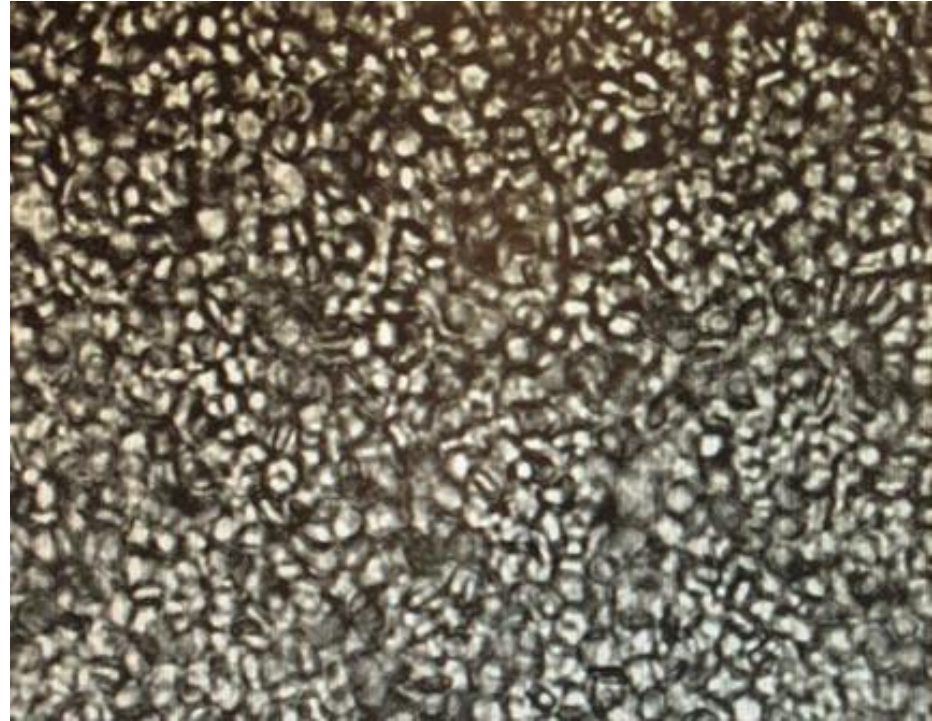


Image representative of a 40x objective field of view. Image taken from the VETSCAN SA.

VETSCAN SA ANALYSIS

Urine samples should not be diluted prior to initial analysis on the VETSCAN SA¹²

Mix urine by gently inverting.

5X

1. Place tube below sample probe and press blue start paddle
2. Ensure sample probe touches tube bottom.

After SA test is started, directions for UA test will be displayed.

40X ☐ x4 ☒ x16 1/0

Patient ID 1234
Species Dog
Patient Name fido
Doctor Smith
Collection Method Cystocentesis
Color Yellow-orange
Clarity Slightly turbid
Specific Gravity 1.027
Dilution Undiluted
Comments
Test Type SA+UA14

SA Test Results:

Parameter	Value	Unit
SA		
RBC		
WBC		
Sq Epithelial		
Non Sq Epithelial		
Hyaline		
Non Hyaline		
Bacteria-Rods		
Bacteria-Cocci		
Struvite		
CaOx dihydrate		

NTR=None to Rare

UA

Parameter	Value(Unit)
Ketones	
Nitrites	
Urobilinogen	
Bilirubin	
Glucose	
Protein	
pH	
Blood	
Ascorbic Acid	
Microalbumin	
Calcium	
Creatinine	
Protein/Creatinine	

Run Send Off

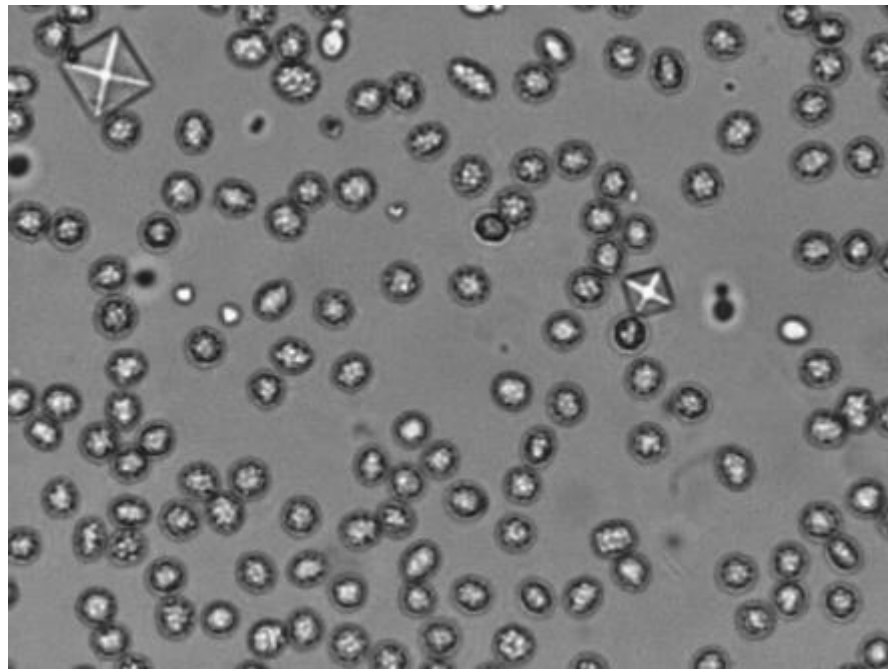
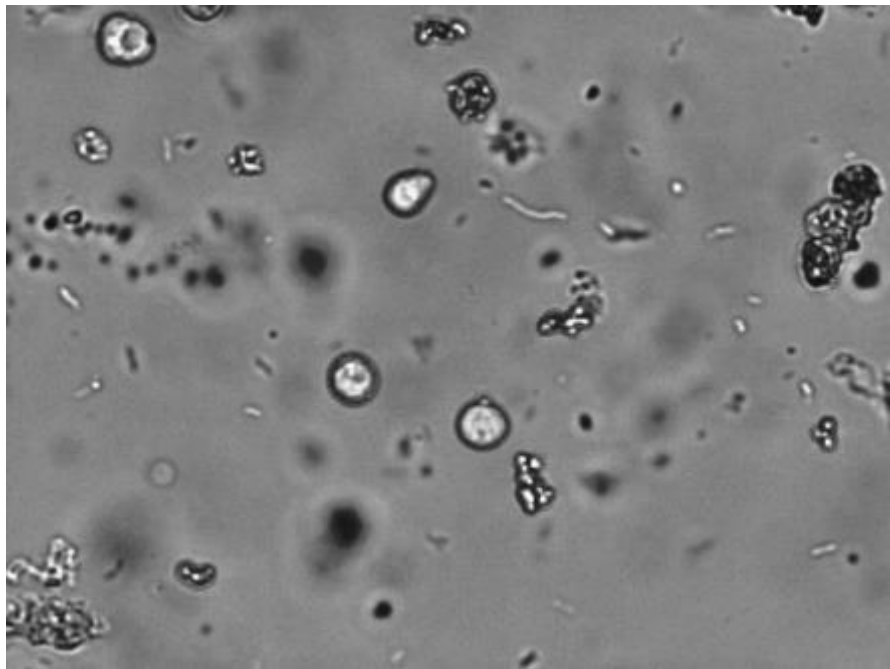
POST-ANALYTICAL EVALUATION

- Dilutions necessary at times due to excessive amounts of sediment elements that may be overlapping, such as red blood cells
 - Formed elements may be hidden due to overlapping elements
- When there are overlapping elements, the VETSCAN SA will provide a 'TNTC – Dilute and Retest' message for the user¹
 - No quantitative or semi-quantitative results provided¹

WHEN 'TNTC – DILUTE AND RETEST' MESSAGE APPEARS, REVIEW THE 96 IMAGES PROVIDED TO DETERMINE NEXT APPROPRIATE STEPS¹

VETSCAN SA IMAGE PROVIDES CLINICAL INSIGHT

NO DILUTION REQUIRED

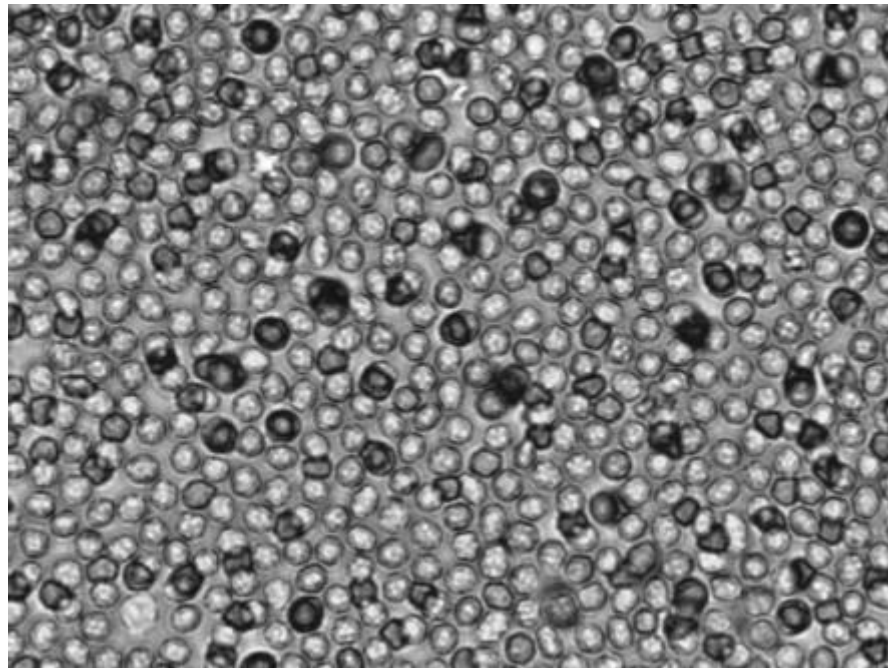
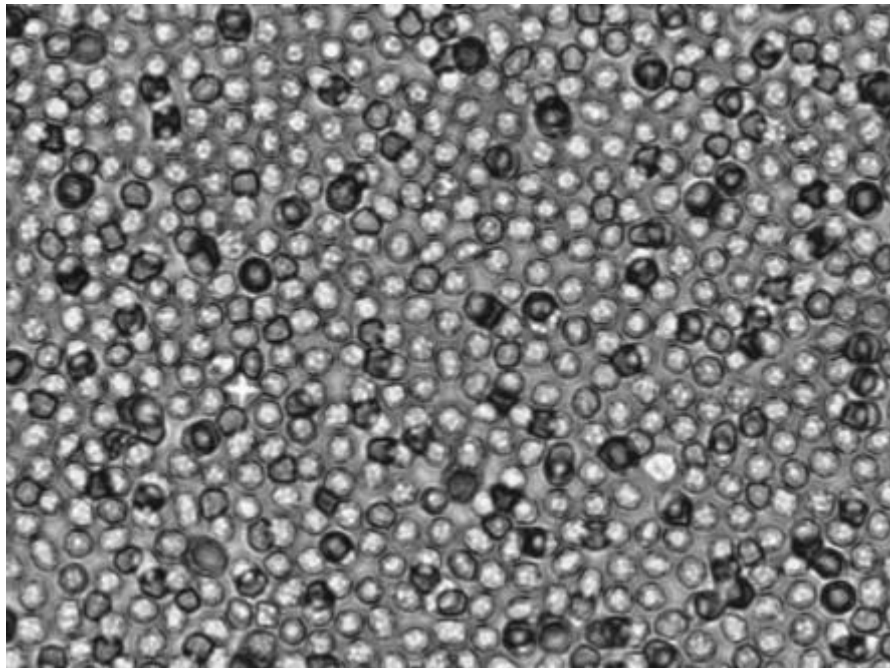


Images representative of a 40x objective field of view. Images taken from the VETSCAN SA.

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VETSCAN SA IMAGE PROVIDES NO TO MINIMAL CLINICAL INSIGHT

DILUTION REQUIRED



Images representative of a 40x objective field of view. Images taken from the VETSCAN SA.

HOW TO PERFORM A DILUTION

If images do not provide clinically actionable information, a 1:2 dilution should be initially performed.¹

Dilution Ratio	Urine Volume	Sterile 0.9% NaCl (Saline) Volume
1:2	0.4 mL	0.4 mL
1:4	0.2 mL	0.6 mL
1:8	0.1 mL	0.7 mL

- Increasing dilutions (1:4, 1:8) should be performed until clinical direction provided
- Use only sterile 0.9% NaCl to dilute urine samples
- Invert tube gently 10-15 times immediately prior to running the sample on the VETSCAN SA
- Run diluted sample immediately

VETSCAN SA DILUTION WORKFLOW¹

Evaluate urine sample.
Note collection method,
color, clarity, and
specific gravity on the
VETSCAN SA Measure
Screen

Mix urine by thoroughly
inverting and run
sample
on the VETSCAN SA.

Review the VETSCAN
SA results and 96
images
provided on the initial
sediment analysis.

If clinical insight cannot
be gathered from the
images, a dilution may
need to be performed.

****It is not recommended to perform a dilution prior to initial evaluation with the VETSCAN SA, as this could result in missing pathology that is present¹**

UA AND SA MAINTENANCE

- MAINTENANCE SCHEDULE SA and UA
- SA TOOLS
- SA DATABASE
 - LINKING UA AND SA RESULTS
 - PRINTING

SA MAINTENANCE SCHEDULE

SA MAINTENANCE:¹

Cleaner Cycle

- Once weekly
- Analyzer prompts for service

Reagent kit change

- Depends on usage; expires every 60 days
- Analyzer prompts for service

Empty Waste container

- Depends on usage
- Analyzer prompts for service

Clean fan filter

- As needed
- Analyzer does not prompt; check frequently

1. Zoetis, (2020). VETSCAN SA User's Manual

SA MAINTENANCE SCHEDULE

SA MAINTENANCE:¹

Controls

- Run on Installation, Troubleshooting with Technical Support
- Run DI water after running controls to ensure accurate results
- Controls are not run routinely on the SA for regular maintenance

Autofocus

- Runs automatically every hour

1. Zoetis, (2020). VETSCAN SA User's Manual

UA MAINTENANCE SCHEDULE

UA MAINTENANCE:¹

UA Strips

- Container should be tightly closed when not in use
- Room temperature
- 90 Day shelf life once opened

Carriage and Tray Maintenance

- Wipe down after each use
- Carriage can be removed for cleaning as needed

Check Strips

- Two provided for multiple use
- Replace into container and keep sealed after use
- Run at install, troubleshooting, if analyzer has not been in use for 12 months

Loading paper

1. Zoetis, (2020). VETSCAN SA User's Manual

UA MAINTENANCE

Check Strips: compare results to label on side of bottle.

Check Strips

<u>Semi-Quant</u>		<u>SI</u>	<u>CON</u>
LEU	-	0 Cell/ μ L	0 Cell/ μ L
KET	-	0 mmol/L	0 mg/dL
NIT	-		
URO	Normal		
BIL	-	0 μ mol/L	0 mg/dL
PRO	-	<0.15 g/L	<15 mg/dL
GLU	-	0 mmol/L	0 mg/dL
SG	1.060		
BLD	-	0 Cell/ μ L	0 Cell/ μ L
pH	5.0		
ASC	+3	5.6 mmol/L	100 mg/dL


Dry Use Only.


Not for use with urine or control sample.


For Veterinary Use Only


REF: 1500-0025
1500-7008 Rev. A

TOOLS

 Measure

 Database

 Tools

23-01-2020 15:47:32 

Login name: User
Last login time: 23-01-2020 15:44:07

Reagent lot number: 1234567
Reagent install date: 06-01-2020
Reagent expiration date: 06-03-2020

Rinse B last use: 23-01-2020 0:00:18
Cleaner last use: 15-01-2020 14:56:37
Auto Focus last ran: 15-01-2020 10:45:12

UA Version: V1.2.0
UA SN: UA00400


Printer: HP Officejet Pro 6230


Network: Off


Type	Error No.	Description	Time
------	-----------	-------------	------


Solve

MAINTENANCE



Auto Focus



Flush


Kit Change



Reagents


SETTINGS


Options


UA Connect

ADMIN


Logout


About

Improved UA to SA Connection with a new UA Connect Icon.

DATABASE



1. RETEST

2. DATABASE SEARCH

3. DATABASE PRINT

RETEST¹

1. SA RETEST MODE IS ENABLED WHEN ANY OF THESE WARNINGS APPEAR:

- 1.REVIEW IMAGES
- 2.TNTC- DILUTE AND RETEST
- 3.POSSIBLE SHORT SAMPLE

If a retest on the SA is not desired, just click “Save”. If a retest is desired, the initial SA test data will not be saved to the Database.

The screenshot displays the Vetscan SA software interface. The top bar includes 'Measure', 'Database', and 'Tools' icons. The main window is divided into several sections:

- SA Test Results: Completed** (10-07-2019 10:47:39):

Parameter	Value	Unit
RBC	NTR	/ul
WBC	NTR	/ul
Sq Epithelial	NTR	/ul
Non Sq Epithelial	NTR	/ul
Hyaline	NTR	/ul
Non Hyaline	NTR	/ul
Bacteria-Rods	NTR	
Bacteria-Cocci	NTR	
Struvite	NTR	
CaOx dihydrate	NTR	

NTR= None to Rare.
- UA** (10-07-2019 10:47:39):

Parameter	Value(Init)
Ketones	- 0 mg/dL
Nitrites	-
Urobilinogen	+1 2.0 mg/dL
Bilirubin	+1 0.5 mg/dL
Glucose	- 0 mg/dL
Protein	+1 30 mg/dL
pH	6.0
Blood	- 0 Cell/ul
Ascorbic Acid	+3 100 mg/dL
Microalbumin	>+2.5 mg/dL
Calcium	<=4.0 mg/dL
Creatinine	>=300 mg/dL
Protein/Creatinine	<0.2
- Patient Information:**
 - Patient ID: 1234
 - Species: Dog
 - Patient Name: fido
 - Doctor: Smith
 - Collection Method: Cystocentesis
 - Color: Yellow-orange
 - Clarity: Slightly turbid
 - Specific Gravity: 1.027
 - Dilution: Undiluted
 - Comments:
 - Test Type: SA+11A14
- Images:** A 4x4 grid of microscopic images. The top-left image is highlighted with a yellow border.
- Buttons:** 'New', 'Save', 'Print...', and 'Retest'.
- Footer:** 'Network: Off'.

DATABASE SEARCH

Search allows results stored in the database to be located by date range, Patient ID, Patient Name, or Test Type.

Patient ID	Patient Name	Type	Send
1234	fido	SA+UA14	Auto
Hades	Hades	SA+UA14	Auto
Hercules	Hercules	SA+UA14	Auto
Hercules	Hercules	SA+UA14	Auto
Hercules	Hercules	UA14	Auto
1234	fido	SA+UA14	Auto
1234	fido	SA+UA14	Auto
1234	fido	SA	Auto
1234		UA14	
1234		UA14	
1234	fido	SA+UA14	Auto
1234	fido	SA+UA14	Auto
1234	fido	SA+UA14	Sent
1234	fido	SA	Final
1234	fido	SA	
5678	fido	SA	Final
1234	fido	SA+UA14	Final
5678	fido	SA	Final
5678	fido	SA	
5678	fido	SA	
5678	fido	SA	
5678	fido	SA+UA14	Final
1234	fido	SA+UA14	Auto
Kirstens Test		SA+UA14	Auto
77777777		UA14	Final
Fido	Fido	SA+UA14	
Patient		SA	Final
1 234567890		SA	Final
1 234567890		SA	

40X x4 x16 1/0

Patient ID: Species: Patient Name: Doctor: Collection Method: Color: Clarity: Specific Gravity: Dilution: Comments: Test Type:

SA Test Results:

Parameter	Value	Unit
RBC		
WBC		
Sq Epithelial		
Non Sq Epithelial		
Hyaline		
Non Hyaline		
Bacteria-Rods		
Bacteria-Cocci		
Struvite		
CaOx dihydrate		
NTR=None to Rare		

UA

Parameter	Value(Unit)
Ketones	
Nitrites	
Urobilinogen	
Bilirubin	
Glucose	
Protein	
pH	
Blood	
Ascorbic Acid	
Microalbumin	
Calcium	
Creatinine	
Protein/Creatinine	

Search Print... Send Network: Connected

Search

Conditions

Date: 2018-08-06 ~ 2018-08-06

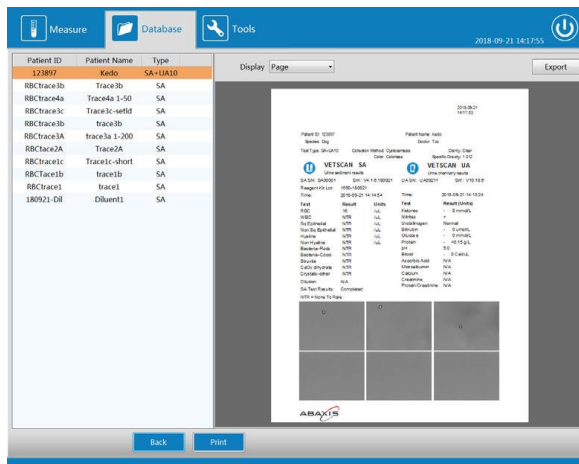
Patient ID: Patient Name:

Test Type:

OK Cancel

PRINTING

Print... provides a print preview of the test performed so that results can be reviewed and printed if needed



Display

Page

Export

The print preview screen can be viewed in Page, Real, or Width display options. The PDF results can be exported. The file will save as PDF to external flash drive plugged into back of SA. The file name format is the PID + Date/Time of when the file is exported.

REFERENCES

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