



Tests and Results

Tracking requested tests and logging results Contact Species360 Support

In ZIMS for Medical, there is a 4 step workflow covering sample collection, testing and results review permitting you to:

1) <u>capture a sample from a patient</u>

2) send sample for a test

- 3) test panel set up and recording the results when they return
- 4) <u>review the findings</u>

Recording Clinical Findings & Diagnosis from Results Additional: Recording Sensitivity Results for Culture Results

Note, in Tests & Results you are provided a comprehensive list of available tests to choose from via the <u>test dictionary</u>. To request a test be added to the Global Test Dictionary, you may fill out the Global Test Request form found in the ZIMS Help Menu and submit it to <u>Support@Species360.org</u>

This document covers the second, third and fourth steps of this workflow- these steps are managed in the "tests and results" portion of ZIMS for medical. The first step, <u>Sample</u> <u>Recording</u> can be recorded directly for the animal/group record or can be recorded as a part of an Anesthesia Event.

Request Tests

There are two ways to request tests on your samples.

1. From within the animal medical record.

Select Samples from the left side Dashboard, highlight the appropriate Sample on the main screen and select Request Test:

Dashboard	Animal	Date	Details		Responsible Staff
Select animal to see detail	∃ Mar 20, 2014				
Records 7	100002 / Common zebra / MIG12-296144	92 Mar 20, 2014	13:15 / Feces / /		Adrienne Miller
🕤 100002 / Common zebra 7 🗙	a M. 01, 2014				
Today Z Common Sees X X Sees.X A restribut Sees.X	 Hs 000 2014 100002 / Common zebra / MG12-20814 	82 Mar 01, 2014	00 00 / Whole Blood / /		Adrience Wiler
Geshboard	2 Exports P.DF 10 Eds 20 Deleters () Req				
Clinical Notes		Taxonomy	Sex		Age
	G MIG12-29614492 100002 E	iquus burchelli/Common zeb	ra Fem	sle Oct 15, 2000	13Y 5M 5D
Diagnoses & Procedures	r Sample Detail		-Sample Quality		
Treatments/Prescriptions	Collection Date/Time Mar 2	0. 2014 13:15	Color	Straw	

If Subsamples have been created from the original

Sample, the grid will display them. Highlight the appropriate Sample and then click Select & Continue.

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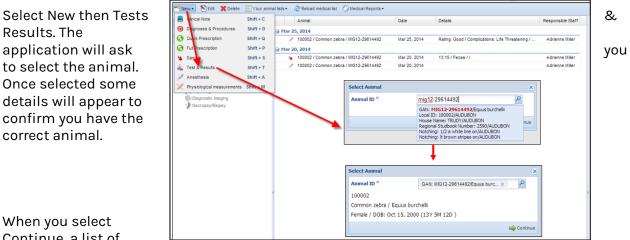




Subsample List for context sample			
Date / Time	Original	Local ID / GSN	
07/Sep/2017 00:00	YES	~/S-HYK17-078683	
07/Sep/2017 00:00	NO	~/S-HYK17-078683-S01	

This will take you to the Test Request screen.

2. Start from the Dashboard.



When you select Continue, a list of

recently recorded samples will appear. If one of these is the correct sample highlight it and choose Select & Continue.

5ample					×
Recent Samples Sa	mple Search				
			ow. Please choose the ap e button when a new san		
Date / Time	Sample Type	Original	Local Sample ID / GSN	Collected From	
11/Sep/2017 00:00	Plasma	YES	11391 / S-HYK17-078686	Antemortem	
10/Sep/2017 00:00	Feces	YES	11391 / S-HYK17-078687	Antemortem	
07/Sep/2017 00:00	Urine	YES	11391 / S-HYK17-078683	Antemortem	
07/Sep/2017 00:00	Urine	NO	11391 / S-HYK17-078683	Antemortem	
11/Aug/2017 00:00	Feces	YES	11391 / S-HYK17-078682	Antemortem	
11/Aug/2017 00:00	Feces	NO	11391 / S-HYK17-078682	Antemortem	
🖶 Add New Sample				📫 Select & Continu	ue

If the appropriate sample does not appear in the list you can select the Sample Search tab.

Checking the Available Samples/Subsamples Only box will filter out any Samples whose status is Consumed, Discarded or Lost. You can also Add New Sample from either tab.





Recent Samples	Sample Search				
ample Type	Please Select	~			
Collected From Antemortem	O Postmortem O All	Collection Date After	Before		
🖊 Available sample	s/subsamples only				
Available sample	s/subsamples only			Reset () Sear
				🌮 Reset 🔇	🔍 Sear
Available sample				🌮 Reset 🛛 🕼	2 Sea
		Original Local	Sample ID / GSN (🕫 Reset 0	Q Sear
ample Search Resu	lt	-			Q Sea
ample Search Resu	It Sample Type	YES 11391	/ S-HYK17-078686	Collected From	2 Sear
iample Search Resu Date / Time 11/Sep/2017 00:00	It Sample Type Plasma	YES 11391 YES 11391	/ S-HYK17-078686 /	Collected From Antemortem	Q Sea

Highlighting the sample and Choosing Select & Continue or adding a new sample will take you to the Test Request screen

If External Laboratory is checked there is a field to record what laboratory it was. This is sourced from the Institution List so if there is a lab you commonly use that is not on the list you may need to add it to your Local Institution list.



If the sample is too small to actually test, check the Insufficient Sample box.

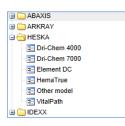
If My Institution is checked there is a field to record who did the analysis. This list is sourced from your Staff list.



The Analysis Equipment is not mandatory and is a cascading dropdown. You can select at any level in the list.







The Sample Info is not editable and is only for your information. However, since the Sample Quality may have altered since the collection that data is editable and will update the record if changed.

Sample Type Feces	Edit Sample Quality	×
Sample Type Feces Sample Collection Date & Time Mar 20, 2014 13:15	Color	Consistency
Additives/Preservatives Anatomical Source/Tissue	Straw 💙	soft 👻
- Sample Quality	Color Intensity	Additional Charasteristic
Color Straw	light 👻	Abnormal odor 🛛 🗙 👻
Color Intensity light	Clarity	
Clarity Consistency	Please Select 💌	Degraded or Deteriorated
Additional Characteristics		⋥ Save 🚫 Cancel
Degraded No		Save Conter

You may see tests by the same name but with an [a],[m] or a [c] beside the test name, the definitions for these terms are as follows:

[a] automated - A machine is providing the results

[m] manual - A technician or physician has manually counted the results

[c] calculated - ZIMS Is calculating a value based on a formula using the results of other entered tests

To add a new test you can type into the Add New Test field if you know the name of the test you want performed. This is a Type Ahead lookup field so ZIMS will present possible matches as you type.

Add New Test	pO2	P 🗖
	pO2 Partial Pressure of Oxygen Whole Blood	

Or you can use the magnifying glass to perform a Search to lookup the test by entering the category and asking for Valid Samples.





ategory	Full Test Name	Valid Samples		
Hematology 🗸		Whole Blood	~	
anguage *	Abbreviated Name	Result Type		
English 🗸			~	Include Obsolete Records
				🔍 Search 🔗
				Q Search 🐉

You can then select it from the results grid.

		Full Test Name	Abbreviated Name	Valid Samples	Category
9		Segmented Neutrophil absolute count (manual)	Neutrophils	Whole Blood	Hematology
3		Segmented Neutrophil absolute count (automated)	Neutrophils	Whole Blood	Hematology
9	-	Reticulocyte percentage (manual)	Reticulocytes	Whole Blood	Hematology
1		Reticulocyte percentage (automated)	Reticulocytes	Whole Blood	Hematology
		Red Cell Distribution Width (automated)	RDW	Whole Blood	Hematology
9 😐		Red Blood Cell count (manual)	RBC	Whole Blood	Hematology
1 🔶		Red Blood Cell count (automated)	RBC	Whole Blood	Hematology
3 😐		Platelet count (automated)	Platelets	Whole Blood	Hematology
3 🔶		Plasma appearance	Plasma appearance	Whole Blood, Plasma	Hematology
1		<u>eH</u>	pН	Whole Blood, Serum, Plasma	Hematology
3		Partial Pressure of Oxygen	p02	Whole Blood	Hematology
3 🔵		Partial Pressure of Carbon Dioxide	pCO2	Whole Blood	Hematology
1		Packed Cell Volume	PCV	Whole Blood	Hematology
1		Oxygen Saturation	s02	Whole Blood	Hematology
	Pag		Change 🔠 🏆	whole blood	1 - 20

You can continue adding new tests until you have all that are desired.

Test	Primary Result		Secondary Result	Low RI	High RI	Evaluation	Excld. from RI	Clinical Finding	Reviewed	Remove
pO2	Please Select	~	N/A	~	~	~				×
Lymphocytes	Please Select	~	N/A	~	~	~				
HCT	Please Select	~	N/A	~	~	~				×
Basophils	Please Select	~	N/A	~	~	~				×
WBC	Please Select	~	N/A	~	~	~				×

Selecting the View/Edit hyperlink will take you back to the Test screen where you can add more Tests, remove a Test, or add Test Results.

🚏 Export to PDF 🕈	🖣 Edit 🛛 💥 Delete 🛛 🕕 Request "	Test 👫 Move T	To Storage 🏠 Send Out 💠 Create Subsample 🔄 Sample Tree View	🗖 Maxi
Exclude from ref	erence intervals No			
-Initial Holding Condit	tions		7	
Initial Holding Te	emp. ~			
Initial Holding Du	uration ~			
Sample History				
Date	Sample ID / Sample GSN	Status	Laboratory / Test Order / Test Results	
Mar 27, 2014	~/S-PLT14-00001	Available	AUDUBON/5/0 View / Edit	
Notes				
~				

Another way to edit the original Test Request is to select Request Test again. Samples with existing tests will be listed and you can select and edit. If the sample is not on the list, for example a Subsample you have not yet created, then select Not in the List and it will take you to the screen to add it.





Sample Type	Lab	Requested tests
Plasma	PHILA	Chemistry/Fluid Analysis (13)

The grid will display all samples and you can highlight the correct Sample and choose Select & Continue.

ample Selector			×
Subsample List for context sample			
Date / Time	Original	Local ID / GSN	
11/Sep/2017 00:00	YES	/ S-HYK17-078686	
11/Sep/2017 00:00	NO	/ S-HYK17-078686-S02	
11/Sep/2017 00:00	NO	/ S-HYK17-078686-S03	
11/Sep/2017 00:00	NO	/ S-HYK17-078686-S01	

Manage Test Panels and Enter Results

In ZIMS, you are able to manage a list of the typical tests that are available from a specified laboratory. These are called Test Panels and you are able to create a list of a series of tests to be applied to a sample. When applied to your sample, these rows of tests are presented in the order/format that is provided by your laboratory results making data entry quicker and easier. In addition to the test panels, you can quickly proceed through these rows of data entry using tab down keyboard shortcuts.

The tests you have recorded for your Panel will display in the order that you arranged them in the Test Panel you created.

dd Test & R	esult					
🗜 Add New (Clinical Diagnosis					
Laborato ANTECH Analysis	uested * 2017 🔹 nal Laboratory 💿 My Ir ry * 🚇	Requested By Please Select Istitution Analysis 5 12/Sep/20	itart Da	te P	~	Sample II Sample II Sample T Sample C Additives Anatomic Sample Q Color Color Inte Clarity Consisten Additiona Degraded
Test Requ	ests & Test Results					
Test Pane		🕶 💽 Insert t	below	‡		
	Select One					
Notes/	1. Antech chemistry					
	2. Antech Superchem					
	3. Avian Comprehensive C	Chemistry 2	10	IΞ	69	iii 🤭 🗸

Now record the test results. If the default Unit of Measure is not what you desire it to be you can use the dropdown selections to select the appropriate unit.

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est Panel	zebra blood 👻 💈	🛽 Insert below 🔅				
	Test		Primary Result			
	HCT		% (c)	~		
	Natt-Herrick WBC		*10^3 cels/µL	~		
	Lymphocytes	2.64	*10^9 cells/L			
	Basophils	76	Select One *10^9 cells/L *10^9 cells per litre			
	pO2	86.5				
Notes/Co	omments		*10^3 cells/µL *10^3 cells per micr	olitre		

There is a keyboard shortcut to make data entry easier in these lab results screens. <u>Tab-Down</u> for easy data entry, keyboard shortcut.

Test		Primary Result		Secondary Result	Low RI	High RI	Evaluation	Excld. from RI	Clinical Finding	Reviewed	Remov
нст	0.575	% (c)	~	N/A	~	~	~				×
Natt-Herrick WBC	7.94	*10^3 cels/µL	~	N/A	~	~	~				×
Lymphocytes	2.64	*10^9 cels/L	~	N/A	~	~	~				×
Basophils	76	*10^9 cels/L	~	N/A	~	~	~				×
pO2	86.5	mmHg	~	N/A	~	~	~				×
Notes/Comments											
								Note Te	emplates	~ (
В / Ц ме <u>А</u> * 🥙 * 📿	E 13 00	🀳 💙 💷									

If a bacterial culture test yields a bacterial name, the Secondary Results column becomes active and you can indicate the measure of growth obtained

		Test Requests & Test Results 🧇
		Test Panel Please Select 💌 🚺 Insert below 🔅
Expected Results (Based Type: Min- Max Mear	Result	Test
	Taxon Result 💌 Taxonomy 🖉 ~	Bacterial culture
~	Secondary Result scant growth	

When you select to create new tests, if there are any existing requests for tests that have not been reviewed you will receive a list of them. Choosing Select & Edit will take you into the test screen to edit or review. If it is a new test you want to record, then select Not in the List and add the new test.

 Pending Test & Results
 X

 Instruction: Existing requested tests for this animal are listed below. Please choose the appropriate request and then click on Select & Edit or use the Not in List button when no requested tests have been entered.

 Date
 Sample Type
 Lab
 Requested tests

 Mar 31, 2014
 Feces
 AUDUB...
 Microbiology/Cultures (1)

 Mar 27, 2014
 Whole Blood
 AUDUB...
 Hematology (5)

If you do not intend to fill in data for a specific test in a panel being used, remove the record row. Failing to do so will leave this record 'stuck' in the 3 step of the workflow until a valid result is entered or the test type row is removed:





Test		Result	Expected Results (Based on Best Available Match) Type: Min- Max Mean [Median] N (Animals)	Eval	ation	Excld. from RI	Clinical Finding	Reviewed	Remove
Aerobic Culture	Taxon Result	▼ Escherichia coli / E. coli ×	P~		~				×
	Secon	ndary Result scant growth	*						
Direct Exam.	No parasites four	nd	× ~		~				×
BUN	20.8	mg/dL	Global sp RI: 6.7 - 57.5 27.7 [25.8] N=44 (33 animals)	2	~				×
Monocyte count [c]		*10****	Global subro BTL 0.042 - 0.810 L 0.275 [0.246] N - 45 (25	-					×
Monocyte % [a]	40	%	Global sp RI: 0.0 - 12.0 3.8 [3.0] N=46 (25 animals)	(2) н	gh				×

Reviewing Results

Pending tests (1)	-6			Animal		
Results for review (524)	- 4	2	∃ Tiffany Wolf			
Tests & Results Simple Search			ć	12470	Moose /	
Animal ID		М	6	11950	Canadia	
Search for Animal ID	2		6	12323	De Braz	
Taxonomy			6	12323	De Braz	
Search for Taxonomy	P		6	12512	Rock hy	
▼ Include Taxon Below			3	12512	Rock hy	
Sample Type			2	12964	De Braz	
Please Select	~		6	13499		
Laboratory				12470		
Please Select	~			12470		
				14013		
Date Requested		-	-	12470		
🔗 Reset & Refresh	Q Sea	rch	e	13495		
Tests & Results Advanced Searc	h	•	- *		Animals	
O Dashboard			Z Exp	ort to PDF	N Ed	
Clinical Notes				GAN		
-			6	MIG12-297	69734	
Diagnoses & Procedures			Test P	Request De	tails —	
Prescriptions/Treatments				Request	ed	
🜔 Samples 🏉				ested By ysis Start	Date &	
🕙 Tests & Results			Anał	ysis By ysis Equir		

1) From the ZIMS Medical dashboard, to review the tests & results that are pending results or awaiting approval, select the Tests & Results Search in the left hand Dashboard.

2) You have two prefilled search filter options: 'Pending Tests' and a 'Results for Review'.

3) Both of these filters will reflow the main dashboard results window (middle pane) presenting items that are either awaiting results entry or for those with all entry rows fulfilled, awaiting the reviewed column check boxes to be filled.

When you have recorded test results and reviewed them remember to check the Reviewed box.

Test	Result	Expected Results (Based on Best Available Match) Type: Min- Max Mean [Median] N (Animals)	Evaluation	Excld. from RI	Clinical Finding	Reviewed	Remove
Aerobic Culture	Taxon Result 👻 Escherichia coli / E. coli 🗴 🖉 🤊		~				×
	Secondary Result scant growth	~					

Once all rows have both been filled with test results and the check box for "reviewed" has been checked, the 4 step workflow is complete. Once this review has been completed, the test will no longer display in the Pending Tests & Results filter (see below) but will remain as a part of the Tests and Results record type for future reference.

Recording Clinical Findings & Diagnosis from Results

When recording test results, some will produce an evaluation depending on the test result and expected results for the species.

If the evaluation is low or high, the Clinical Finding checkbox will become active.

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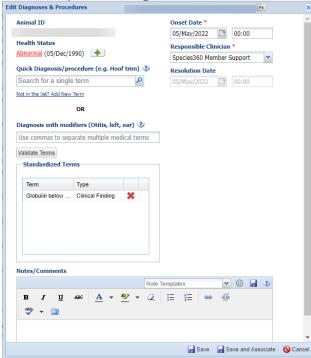


Test	Results	Expected Results (Based on Best Available Match) Type: Min- Max Mean [Median] N (Animals)		Evaluation	Excld. from RI	Clinical Finding	
Glucose	8.0 mmol/L	Global sp RI: 0.11 - 17.22 8.30 [8.05] N=75 (39 animals)	3	~	No	~	
Uric Acid	256 µmol/L	Global sp RI: 6 - 488 141 [107] N=79 (41 animals)	3	~	No	~	
Phos	0.9 mmol/L	Global sp RI: 0.48 - 3.92 1.90 [1.73] N=76 (37 animals)	3	~	No	~	
Ca 2.9 mmol/L Global sp RI: 1.9 - 3.8 3.0 [3.0] N=75 (41 animals)		3	~	No	~		
Na	la 166 mmol/L Global sp RI: 130 - 178 159 [159] N=59 (29 animals)		3	~	No	~	
к	5.0 mmol/L Global sp RI: 1.3 - 7.5 4.0 [4.0] N=59 (29 animals)		3	~	No	~	
Chloride	oride 123 mmol/L Global sp RI: 94 - 130 118 [119] N=44 (22 animals)		2	~	No	~	
Total Protein	40 g/L	Global sp RI: 42 - 78 61 [61] N=79 (42 animals)	3	Low	No	1	
Albumin.BCG	19 g/L	Insufficient data		~	No	~	
Globulin	21 g/L	Global sp RI: 24 - 61 41 [41] N=50 (26 animals)	3	Low	No		
A:G ratio	0.9 ratio	Global sp RI: 0.1 - 1.2 0.6 [0.6] N=51 (27 animals)	3	~	No	~	
AS (reported)	46 U/L	Global sp RI: 10 - 175 52 [35] N=79 (39 animals)	3	~	No	~	
Alk. Phos.	8 U/L	Global sp RI: 4 - 105 40 [30] N=85 (47 animals)	3	~	No	~	
Creatine Kinase	8,228 U/L	Global sp RI: 108 - 6,058 1,574 [1,047] N=63 (32 animals)	3	High	No		

Clicking the clinical finding checkbox will auto-create a diagnosis for that test result in the animals records:

	Animal	(18 Records)	Date	Details	Responsible Staff	
🖃 05/Ma	y/2022					ľ
Ð	/ Green iguana /		05/May/2022	Clinical Finding: Protein below expected range	Species360 Me	1
Ð	/ Green iguana /		05/May/2022	Clinical Finding: Globulin below expected range	Species360 Me	

You can open the diagnosis to add more related diagnosis.



If you want to remove the diagnosis, you can highlight the diagnosis and click Delete on the Medical Dashboard, or uncheck the Clinical Finding checkbox.

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Note, if you delete the diagnosis from the dashboard, the checkbox will remain checked, you will still need to uncheck the box if no longer applicable.

You can also add a new Clinical Diagnosis directly from the Tests & Results screen. <u>Clinical</u> <u>Diagnosis is covered here</u>.

8 Medical Records					
Add Test Result					
🛞 Add New Clinical Diagnosis					
Test Request Details			Sample Info		
Date Requested *	Requested By *		Sample Type	Feces	
Mar 27, 2014	Adrienne Miller	*	Sample Collection Date & Ti	me Mar 20, 2014 13:15	
External Laboratory My In	nstitution		Additives/Preservatives		
Analysis By	Analysis Start Date & Time				
Adrienne Miller	Mar 27, 2014 🔲 00:00		Anatomical Source/Tissue		
	< >		Sample Quality		
Analysis Equipment			Color	Straw	N Edit
~			Color Intensity	light	
✓ Insufficient sample			Clarity	~	
			Consistency	soft	
			Additional Characteristics	Abnormal odor	
			Degraded	No	
Test Results					
Test Panel Please Select	V Insert below				
rest Parlet Pidase Select					
Notes/Comments					

Recording Sensitivity Information for Culture Results:

Microbiology or culture results often include additional information about the antimicrobial drugs that might be effective treating the organism isolated by the laboratory. If you decide to enter this drug sensitivity data into ZIMS, it should be placed in the comments section of the Test & Results record. Here are hints to make it easier and faster to get this information into ZIMS.

- i. <u>Copy/paste</u>: If your results are provided on a web page (example: the VetConnectPlus website) a copy/paste of the sensitivity results from that web page is likely to be the easiest solution and will often maintain the text format provided by the laboratory. A copy/paste from a pdf or an email laboratory report is less likely to maintain the format seen in the report and manual entry of the information using a ZIMS template may be needed to make the information easy to read.
- ii. <u>Templates</u>: Use a template to make it easier to manually enter sensitivity results from the laboratory report. Create Test and Result templates that list all the drugs used by the laboratory when testing an organism, then paste that blank template into the comments and add the missing data. Typically a table will provide the easiest format for data entry. An example template could be:

Sensitivity Results				
Antibiotic	Isolate #1	Isolate #1	Isolate #2	Isolate #2
	(S;I;R)	(MIC)	(S;I;R)	(MIC)
Amoxicillin				
Amoxicillin-Clavulanic Acid				
Cephalexin				
Cefovecin				
Amikacin				
Ciprofloxacin				

The list of drugs should be the same as provided by the laboratory and in the same order so that S;I;R and/or MIC values can be entered into the table by simply going

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down a column. Laboratories will usually have a standard list of drugs used for sensitivity testing, but the list may be different for anaerobic versus aerobic organisms and the list of drugs and their order will almost certainly be different for another laboratory. Creating multiple, custom sensitivity templates to meet your needs, rather than trying to merge 2 different drug lists into a single template will typically make for easier data entry. Just remember to name the templates in a manner that makes it easy to select and add the correct template to the test and result comments.

The end result after pasting in the template and entering the sensitivity values should be something like:

Sensitivity Results				
Antibiotic	Isolate #1	Isolate #1	Isolate #2	Isolate #2
	(S;I;R)	(MIC)	(S;I;R)	(MIC)
Amoxicillin	R	>=32		
Amoxicillin-Clavulanic Acid	R	>=32		
Cephalexin	R	>=64		
Cefovecin	S	<=0.5		
Amikacin	S	<=2		
Ciprofloxacin	S	<=0.06		

 iii. <u>Other options</u>: Just enter the most useful information into the comments using a summary format. The above table could be summarized in the single sentence: Isolate 1 sensitive to Cefovecin, Amikacin and Ciprofloxacin. This could provide the veterinarian with the information needed to make a treatment decision while minimizing data entry (but at the cost of discarding some information).

Additionally help:

-Test and Results PowerPoint

-Reporting is available via the <u>Samples, Test and Results report</u> and <u>Specific Test Report</u> -Or learn more about <u>test panels</u>

- Expected Test Results are available when reviewing results

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