**TITLE:**Complete Urinalysis Using theUrisys 1100

PRINCIPLE:

Urine samples are analyzed for chemical and cellular content. Chemical content is detected by a urine dipstick. The presence of a chemical in a urine is indicated in change in color on the dipstick. The dipstick can be read visually or by mechanical means. Cellular content is given by the technologist who looks at the urine microscopically when needed. Urine results are standardized by using the same tube and slide system for each specimen.

**CLINICAL SIGNIFICANCE:**

Macroscopic urinalysis is a screening test utilized to help rule out or identify infection and to provide information regarding the status of carbohydrate metabolism, kidney and liver function and acid-base balance.

### PERSONNEL:

###### Medical Technologists

## SPECIMEN COLLECTION/TREATMENT:

Random or clean catch, freshly collected urine sample. If a specimen cannot be examined within 2 hours of collection, it must be kept refrigerated. Remember to warm urine to room temperature before testing.

**If a urine pedibag comes from** ECY please run the urinalysis, even though the specimen is not optimal. The ECY understands that the specimen is not appropriate but are looking for information that might help them with the diagnosis for a patient who cannot tell them how they feel. Put a disclaimer on the accession to comment that the specimen is not optimal for testing. If a microscopic is required, the technologist may do a microscopic examination but again place a disclaimer on the results. Use comment – Specimen inapp. – Run per client.

**Urine specimens obtained by catherization in pediatric patients** will arrive in the lab in a sterile tube or sterile cup (not the typical yellow and grey tubes) When you receive one of these sterile tubes, please pour off a small amount of urine into a plastic conical tube to be used for the dipstick testing. Retain specimen in the original sterile cup for subsequent culture set up.

Rejection Criteria for Urine Specimens Include the Following:

a. Leakage

>Specimens with lids not tightly secured and which have leaked into the

biohazard bag will be rejected.

b. Transport/Storage

>Specimens not transported as directed precludes accurate analysis.

>Specimens not refrigerated prior to transport when transport is greater

then 2 hours post collection precludes accurate analysis.

c. Contaminates

>Specimens contaminated with feces, menstrual flow or barium may

preclude accurate analysis

d. QNS

>Urinalysis requires a minimum of 8 ml to prevent dilutional criteria

from being utilized. Specimens of less than 8 ml precludes accurate analysis and will not be rejected but needs qualifying comments within the procedural text indicative of volume effect. Comment “short” with description “short sample; results affected.”

### EQUIPMENT & REAGENT:

Kova tubes, slides & cover slips, caps and pipettes

Roche Chemstrip 10

###### Microscope

Urisys1100

BD yellow urine collection tubes.

QUALITY CONTROL:

As the Urisys 1100 is a back-up instrument, Alta Diagnostics Negative and Positive Controls will be run once a week, unless the instrument is in use. Enter these results into the LIS Quality Control Program.

Once any of these controls are run on a particular day that will be sufficient for any other patients run that day.

If you need to open a new bottle of chemstrips, please run a control to check those reagents before use. Enter these results into the LIS Quality Control Program.

See Quality Control in Urinalysis Procedure No. 7180-UA-4 for more information.

CALIBRATION:

* Calibration is required if using the Chemstrip 10 Test Strips. These test strips are calibrated using the gray reference pad on the test strip tray.
* The Urisys 1100 Urine Analyzer must be calibrated every seven days or when indicated by the analyzer.
* The Chemstrip Urine Analyzer Calibration Strips should remain in the vial until just before use. Do not touch the elevated gray areas on the strips.
* The calibration strips should be used only *once.*
* If you do not obtain a successful calibration, the analyzer will not process samples.
* Calibration should be documented on the *Preventive Maintenance Log.*

See Procedure No 7180-UA-1007 Calibration—Urisys 1100 for more information

## STEPWISE PROCEDURE:

1. When a urine is received in the Laboratory, receive it through the Laboratory Information System.

2. All urines are to be refrigerated until they are ready to be processed if

processing will take longer than 2 hours, warm urine to room temperature

before testing.

1. Mix the urine thoroughly.

### Processing Samples

The Urisys 1100 Urine Analyzer is ready to read when the display

shows a sample number and “INSERT STRIP!”.

1. Dip the test strip briefly (one second) in the urine sample. 

Draw the long edge of the strip along the rim of the

specimen container to remove excess urine.

Touch the long edge of the strip to the absorbant paper

for one second making sure that each pad is blotted.

1. Place the test strip, with the test pads facing upward, 

on the tray so that’s its leading edge is held by

the clip at the end of the strip tray. **The**

**retaining bar must be open** . About 2mm

of strip must be held under the clip .

It is important that the strip is correctly positioned

and ready to be read within 5-10 seconds of dipping strip.

**ATTENTION: To avoid incorrect readings due to a discoloration of the test strip pads, the strip vial must be closed immediately after removal of a test strip, using the original-filled stopper.**

1. Press the START button 

An acknowledging beep sounds. The tray

advances slightly, the retaining bar closes,and

the gray reference pad on the tray is read.

1. If the test strip is not correctly located in the middle 

of the tray, move it gently to the side until it is properly

aligned .Be careful not to move the tray.

Seventy seconds after the START button is pressed,

All test strip pads are read. The results are printed and

the next sample number appears on the dispay.

1. The test strip returns to the starting position and the 

retaining bar opens. Remove and dispose of the test

strip. Wipe any urine residue from the tray with a

lint-free cloth.

6. Abnormals:

1. If the urine is a color that will interfere with the color changes on the dipstick, spin the urine and dipstick it after centrifugation. If the urine is a normal color after centrifugation all results can be accepted
2. If the urine is still an abnormal color after centrifugation, put “See Comment” (close keypad to free type) in the ‘Other’ field under Urine Microscopic resulting. Use comment, “Color may interfere with results for ketone and bilirubin.”
3. Enter and verify all results in the LIS.

NOTE: Routine examination of urine consists of a macroscopic examination or urine screen, utilizing the Roche Chemstrip 10 strips.

A microscopic urinalysis is to be performed when the leukocyte esterase or protein tests are positive at GREATER THAN small levels, blood is positive at GREATER THAN trace levels, nitrites are positive, the appearance is cloudy or turbid, or the color is any color other than colorless, straw, yellow or amber. In these cases, microscopic must be performed, as well as a macroscopic.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | TRACE | SMALL | MODERATE | LARGE | MARKED |
| LEUKO | ----------- | 25 | 100 | 500 | ------------ |
| BLOOD | 10 | 25 | 50 | 150 | 250 |
| PROTEIN | 15 | 30 | 100 | 500 | ------------ |
| NITRITES | \*NEGATIVE | \*POSITIVE |  |  |  |

\*IN REGARDS TO NITRITES, A MICROSCOPIC IS TO BE DONE WHEN THE RESULTS ARE POSITIVE

7. If the above screen is negative report urinalysis through the LIS.

See Reporting Results section of this procedure for complete information on result

reporting.

If a microscopic is indicated, the discern function of the Laboratory Information system

will automatically order the test.

8. Using the BD vacutainer tube or a Kova tube.

9. Spin down the urine for 5 minutes at 1800 r.p.m.

10. Remove the tube from the centrifuge being careful not to disturb or dislodge the

sediment.

11. Insert KOVA Petter into the tube. Push the KOVA Petter to the bottom of the

tube until it seats firmly( at the 1ml graduation)

12. Decant and discard the urine while the KOVA Petter is locked in

position in the tube. This will retain 1ml of urine sediment at the bottom of the tube.

13. Using the KOVA Petter, gently resuspend the sediment until a homogeneous mixture is

obtained.

14. Label each section of a Kova slide with a number corresponding to the specimen number.

15. Deliver one drop of sediment into the corner of the well using a transfer pipette.

Capillary action will uniformly fill the chamber.

16. Blot off excess urine from the slide. If not all areas of the slide have been

used the unused areas can be utilized later.

17. Scan 10 fields of an area on the slide, use low power and record the results for the

following elements:

1. Report as none seen for negative or give an average number of casts per field using low power. Identify types of casts on high power (hyaline, granular, WBC, etc.).

Example: 2-4 Hyaline casts

4-8 Granular casts

1. Check for mucus – Report as:

* none seen for negative
* few for 1 to 5 per field
* mod for 5 to 10 per field
* marked for 10 to 50 per field
* packed for numerous cells per field.

1. Check for amorphous – Report none seen for negative. If present, and report the same as mucus.
2. Check for crystals – When present report the same as mucus.

Example: Many Calcium Oxalate

18. Scan 10 fields using high power and report the following:

a. WBC’s & RBC’s - Record as none seen for negative if none are seen

in 5 fields. If they are present, report in the same manner as casts.

Example: 4-8 WBC

1. Check for epithelium – Report as: none seen for negative

* few for 1 to 5 per field
* mod for 5 to 10 per field
* marked for 10 to 50 per field
* packed for numerous cells per field.

1. Evaluate bacteria, motile tirchomonads, yeast, parasites, fungus, and fat.
2. Comment on budding or mycelial forms of yeast.
3. Report motile trichomonads, yeast, parasites, fungus, and fat as present, if seen.
4. Report bacteria on STAT urines only. Use the terms few, mod, marked and packed in the same manner as epithelium cells.
5. Do not report sperm unless specifically requested to do so by the attending physician.

**NOTES:** Be sure to correlate microscopic results with chemical results

from the dipstick. For example: the presence of WBC cast with

a positive protein or presence of RBC with a positive blood.

Urine specimens from a female through the age of 12, where there is trichomonas and/or sperm noted on the microscopic, there will be another microscopic sample prepared from the original sample. If the findings are the same, they will be confirmed by a second technologist. It is acceptable to request a new specimen before reporting any results. When a second technologist is not available a second specimen will be required for confirmation. Do not share suspect results with the physician until the results are verified and resulted in the LIS.

1. Place original container with remainder of urine sample in appropriate rack to be held for

24 hours.

## REPORTING RESULTS:

1. Login into Soft
2. Open Resulting Worklist
3. Select Template YURN, Urinalysis Yorkville Template
4. Select OK
5. Patients appear on left hand side in the Worklist Pane
6. Select correct patient
7. Use the Results Pane to hand enter results from keypad
8. Verify All results and Save
9. If critical result, select the Call tab and fill out information
10. If microscopic is need LIS will add, refresh worklist
11. Keypad opens for canned choices for microscopic
12. Need to result WBC, RBC, Epithelial Cells, Amorphous Sediment, Mucus Threads to complete UA. Report bacteria on STAT urines only
13. Attach the comment “short sample: results may be affected” to all samples where the volume was less than 8 ml.
14. Click Verify All and Save

See example Urinalysis Report for reference ranges.

## PROCEDURAL NOTES:

1. Pregnancy tests - Pour off an aliquot into a labeled tube and give to Serology.

2. Drug Screen - Spin down specimen. Pour off the supernatant into a

labeled tube and give to Chemistry.

3. Mechanical problems are evident when the analyzer displays an error message. A chemistry

problem may become evident with an unexpected result. Abnormal results are flagged with

an asterisk. If you obtain an unexpected result on any chemistry, refer to the Limitations and

Performance Characteristics section of the Chemstrip urine test strip package insert.

4. If you are comparing the analyzer values against the visual strip values and the deviation is

more than one concentration block, one of the following may have occurred:

♦ Test strip is not positioned correctly in the test strip tray

♦ Power supply failure or high frequency interference by other devices

♦ Visual strip is deteriorated

♦ Improper testing technique

If one of the above situations has occurred, repeat the measurement with a new test strip, being very careful to properly position the test strip. Remove any external source of interferences.

NOTE: When a reflex to culture is ordered (UMACR), urine cultures will be reflexed from a urinalysis based on positive nitrate and/or leukocyte esterase and a microscopic white blood cell count greater than 5. No other positive urine parameters will result in a urine culture.

### INTERFERING SUBSTANCES

See Roche Chemstrip 10 package insert for interfering substances.

### REFERENCES

Urisys 1100 Operator Manual 2003

Roche Diagnostics

Indianapolis, IN. 46250-0457

SCC Computer Systems

Clearwater, Florida





