



SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES

OSSUDU AGARAM VILLAGE; KUDAPAKKAM POST, PONDICHERRY - 605003

Date 02.01.2018

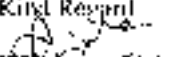
From,
Dr. Parany Sinha
HOD
Pathology
Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry
Bharath Institute of Higher Education and Research,
Chennai.

To
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Permission to conduct value-added course: Urine analysis

Dear Sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled, Urine analysis on Feb-April 2018. We solicit your kind permission for the same.

Kind Regards

Dr. Parany Sinha

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluating the course:

The Dean: Dr. A. Sugunaran

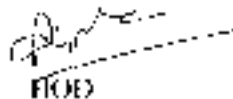
The HOD: Dr. Parany Sinha

The Expert: Dr. Manohar

The committee has discussed about the course and is approved. Dean

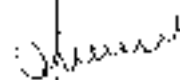


Subject Expert



PROF

DEAN



DEPARTMENT OF PATHOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES,
PONDICHERRY - 605003

PROFESSOR & HEAD, DEPT. OF PATHOLOGY
SRI LAKSHMI NARAYANA INSTITUTE OF
MEDICAL SCIENCES,
PONDICHERRY - 605003.





SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSSUDU AGARAM VILLAGE, KUDAPAKKAM POST, PONDICHERRY - 605003

Circular

9-1-18

Sub: Organising Value-added Course: URINE ANALYSIS

With reference to the above mentioned subject, it is to bring to your notice that **SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES Bharath Institute of Higher Education and Research**, is organising "URINE ANALYSIS" from Feb-April 2018. The course content is enclosed below.

The application must reach the institution along with all the necessary documents as mentioned. The hard copy of the application should be sent to the institution by registered/ speed post only so as to reach on or before **31.1.2018**. Applications received after the mentioned date shall not be entertained under any circumstances.

Encl: Copy of Course content.

Dean
↓
[Handwritten Signature]
20180109 10:21:20 AM
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES
OSSUDU AGARAM VILLAGE, KUDAPAKKAM POST, PONDICHERRY - 605003

VALUE ADDED COURSE

1. Name of the programme & Code

Urine analysis and PA07

2. Duration & Period

30 hrs & feb-april 2018

3. Information Brochure and Course Content of Value Added Courses

Enclosed as Annexure- I

4. List of students enrolled

Enclosed as Annexure- II

5. Assessment procedures:

Short notes - *Enclosed as Annexure- III*

6. Certificate model

Enclosed as Annexure- IV

7.No. of times offered during the same year:

1, feb-april 2018

8. Year of discontinuation: 2019

9. Summary report of each program year-wise

Value Added Course- feb-april 2018					
Sl. No	Course Code	Course Name	Resource Persons	Target Students	Strength & Year

	PA07	Urine analysis DR.A.MANO HAR	2 nd MBBS	feb-april 2018
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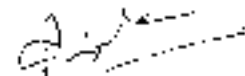
10. Course Feed Back

Enclosed as Annexure- V



RESOURCE PERSON

DEPARTMENT OF PAEDIATRICS
 Sri Lakshmi Narayana Medical Institute,
 PONDICHERRY



COORDINATOR

PROFESSOR & HEAD, DEPT OF PATHOLOGY
 SRI LAKSHMI NARAYANA MEDICAL INSTITUTE,
 PONDICHERRY
 PUDUCHERRY-605 006

Course Proposal

Course Title: Urine analysis

Course Objective:

1. To enhance the knowledge of urine collection and storage techniques
2. To impart information of constituents of urine and abnormalities with various examination methods.
3. To assess the performance skill using urine dipstick method

Course Outcome: Improvement in knowledge and skills of urine collection & examination.

Course Audience: B.A&B.Sc students of second year.

Course Coordinator: Dr.Pammy Sinha

Course Faculties with Qualification and Designation:

1.Dr.Pammy Sinha, Professor & HOD

2.Dr.Manoharan, Assistant Professor

3. Dr Barman, Professor

4. Dr Ritica C, Assistant Professor

5. Dr Priyadarshini J, Assistant Professor

Course Curriculum/Topics with schedule (Min of 30 hours)

S	Date	Topic	Resource person	Time	Hours
1	3.02.2018	Introduction to urine analysis, Background, Objectives.	Dr Manoharan	4-5p.m	1
2	10.02.2018	Collection of urine	Dr P Barman	2-3p.m	1
3	17.02.2018	Preservation of urine: Lecture and video	Dr Priyadarshini J	4-6p.m	2
4	3.02.2018	examination of urine : Introduction	Dr Ritica C	4-6p.m	2
5	5.03.2018	Physical examination of urine - I	Dr Manoharan	4-6p.m	2
6	10.03.2018	Physical examination of urine - II	Dr Pammy S	4-5p.m	2
7	31.03.2018	Chemical examination of urine - I	Dr P Barman	4-6PM	2
8	7.04.2018	Chemical examination of urine - II	Dr Manoharan	4-6p.m	2

9	14.04.2018	Chemical examination of urine - III	Dr Priyadarshini J	4-6p.m	1
10	21.04.2018	Microscopic examination of urine	Dr Pammy S	2-5p.m	3
11	22.04.2018	Dipstick method – lecture and video	Dr Pammy S	2-4p.m	2
12		Practical Class 1			
13	24.02.2018	Collection, storage & Examination of urine	Dr Manoharan	2-3p.m	1
14	17.03.2018	Physical examination of urine	Dr P Barman	2-3p.m	1
15	24.03.2018	Chemical examination of urine	Dr Manoharan	2-4p.m	2
16	15.04.2018	Chemical examination of urine	Dr Priyadarshini J	2-4p.m	2
17	29.04.2018	Microscopic examination of urine, and Dipstick method; Short answers & feedback	Dr Pammy S	2-6p.m	4
		Total			30 hrs

URINE ANALYSIS



PARTICIPANT HAND BOOK

COURSE DETAILS

Particulars	Description
Course Title	Urine analysis
Course Code	PA07
Objective	<ol style="list-style-type: none"> 1. Collection of urine 2. Preservation of urine 3. Examination of urine <ul style="list-style-type: none"> • Physical examination • Chemical examination • Microscopic examination 4. Urine Dipstick
Further learning opportunities	Urine automated techniques
Key Competencies	On successful completion of the course the students will have skill in handling and assessment of urine samples.
Target Student	Second yr MBBS Students
Duration	30hrs feb-april 2018
Theory Session	20hrs
Practical Session	10hrs
Assessment Procedure	Short answers

URINE ANALYSIS

Collection of urine

- Early morning sample-qualitative
- Random sample- routine
- 24hrs sample- quantitative
- Midstream sample-UTI
- Post prandial sample-D.M

Preservation of urine

- Examined within 1-2 hours after voiding.
- If there is delay,specimen should be preserved.
- Preservatives like.
 - Toluene,
 - boric acid
 - formalin
 - Thymol

Urine examination

- Physical examination
- Chemical examination
- Microscopic examination

Physical examination

- Volume
- Color
- Odour
- Reaction or urinary pH

- Specific gravity

VOLUME

Normal volume- 1200 to 2000ml / day.

Polyuria - >2000ml / 24 hr.

Causes of Polyuria.

a)PHYSIOLOGICAL

Cold weather

Increased water intake.

b)PATHIOLOGICAL

Diabetes insipidus

Diabetes mellitus

Chronic progressive renal failure

Oliguria - <500mL / day.

Causes- Dehydration, hot weather

Renal ischaemia,renal diseases.

Urinary tract obstruction.

Anuria - complete suppression of urine.

• COLOUR

Normal urine – Straw yellow.

(urochromes & urobilin)

a)Reddish brown- Increased urobilinogen or

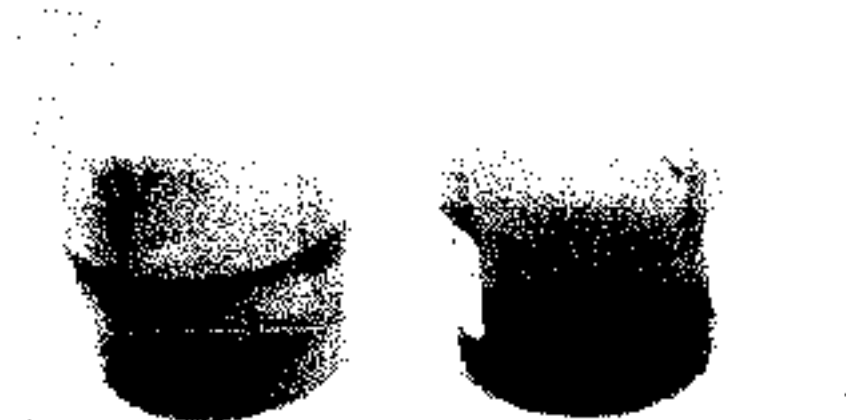
porphyrins

b)Bright red – fresh blood

c)Smoky brown-Blood pigments

- d) Brownish yellow or green- Bile pigments
- e) Milky white- Chyluria
- f) Black - Alcaptonuria
- g) Bright orange red - Rifampicin

Fig. 1



Physical examination of Colour of urine.

Reaction-pH

Normal pH- 4.6 to 8.0

SPECIFIC GRAVITY

Indication of amount of solids in solutions in that urine.

Normal specific gravity- 1.015 to 1.025.

Methods to measure specific gravity.

- Urinometer
- Refractometer



- Reagent strip method.

Fig. 2 : Urinometer

CHEMICAL EXAMINATION

Urine is routinely examined for,

- Protein
- Glucose
- Ketones
- Bile Salts
- Bile pigments

- Hemoglobin

Test for Protein

- Heat Test.
- Sulphosalicylic Acid Test.

Tests for proteins

- Test – HEAT & ACETIC ACID TEST
- Principle -proteins are denatured & coagulated on heating to give white cloud precipitate.
- Method-take 2/3 of test tube with urine, heat only the upper part keeping lower part as control.
- Presence of phosphates, carbonates, proteins gives a white cloud formation. Add acetic acid 1-2 drops, if the cloud persists it indicates it is protein(acetic acid dissolves the carbonates/phosphates)

Heat Test

- Results:
- ve - No Cloudiness
- Trace – Barely visible cloudiness
- 1+ - Cloudiness w/o Granular flocculation
- 2+ - Dense granular cloud w/o flocculation
- 3+ - Dense cloud with marked flocculation
- 4+ - Thick curd like precipitate

SULPHOSALICYLIC ACID TEST

- PRINCIPLE
- Sulphosalicylic acid precipitates protein with turbidity that is approximately proportional to concentration of protein in a solution
- PROCEDURE
- To 2ml of urine,add equal volume of 5% sulphosalicylic acid.Allow it to stand for 10 minutes.
-
- RESULTS
- Negative- No cloudiness

- Trace -Cloudiness just visible against dark background(<10mg/dl)
- 1+ -Dense cloudiness (10-50mg/dl)
- 2+ -Cloudiness with granules & flocculation (50-200mg/dl)
- 3+ - Cloudiness with heavy flocculation(200-500mg/dl)
- 4+ - Cloudiness with flocculation and precipitation (>500mg/dl)

Causes of proteinuria

- **Prerenal causes**-Heavy exercise, Fever, hypertension, multiple myeloma, eclampsia
- **Renal** -acute & chronic glomerulonephritis. Renal tubular dysfunction. Polycystic kidney, nephrotic syndrome
- **Post renal**- acute & chronic cystitis, tuberculosis cystitis

Test for sugar

- **Test**-BENEDICT'S TEST(semiquantitative)
- **Principle**-benedict's reagent contains Cu^{2+} . In the presence of reducing sugars *cupric ions* are converted to *cuprous oxide* which is hastened by heating, to give the color
- **Method**- take 5ml of benedict's reagent in a test tube, add 8drops of urine. Boil the mixture.

Results

Negative- No change in colour

Trace- pale green and slightly cloudy.

- 1 - Definite cloudy green.
- 2- Yellow to orange ppt, supernatant fluid pale blue (<1g/dl)
- 3+ - Orange to red ppt, supernatant fluid pale blue (1-2g/dl).
- 4+ -Brick red ppt, supernatant fluid decolourised (>2g/dl)

Ketone bodies

- 3 types
- Acetone

- Acetoacetic acid
- β -hydroxy butyric acid
- They are products of fat metabolism

Rothera's test

- **Principle**-acetone & acetoacetic acid react with sodium nitroprusside in the presence of alkali to produce purple colour.
- **Method**-take 5ml of urine in a test tube & saturate it with ammonium sulphate. Then add one crystal of sodium nitroprusside. Then gently add 0.5ml of liquor ammonia along the sides of the test tube.
- **Formation of purple coloured ring indicates + test**

Causes of ketonuria

- Diabetes
- Non-diabetic causes- high fever, starvation, severe vomiting/diarrhoea

BILE SALTS

- **HAY'S TEST**

PRINCIPLE

Bile salts reduce surface tension of urine.

PROCEDURE

Sprinkle sulphur powder on the surface of test tube containing urine.

RESULTS

Sulphur powder sinks-positive for bile salts.

BILIRUBIN-Fouchet's test

- **PRINCIPLE**

Bilirubin, when adsorbed on to barium sulphate and treated with ferric chloride and trichloroacetic acid, gives a greenish blue colour.

- **PROCEDURE**

Add 2.5ml of 10% barium chloride to 10ml of urine. Mix and filter. Unfold the filter paper and spread it on the top of another filter paper. Add 1 drop of Foucllet's reagent.

• **RESULTS**

Green or blue colour indicates +ve for Bilirubin.

Blood in urine

• **Test- BENZIDINE TEST**

• **Principle-**The peroxidase activity of hemoglobin decomposes hydrogen peroxide releasing nascent oxygen which in turn oxidizes benzidine to give blue color.

• **Method-** mix 2ml of benzidine solution with 2ml of hydrogen peroxide in a test tube. Take 2ml of urine & add 2ml of above mixture. A blue color indicates + reaction.

Causes of hematuria.

- **Pre renal-** bleeding diathesis, hemoglobinopathies, malignant hypertension.
- **Renal-** trauma, calculi, acute & chronic glomerulonephritis, renal TB, renal tumors
- **Post renal** – severe UTI, calculi, trauma, tumors of urinary tract

Urine Dipstick

- The squares on the dipstick represent the following components in the urine:
- specific gravity (concentration of urine).
- acidity of the urine (pH).
- protein in the urine (mainly albumin).
- glucose (sugar).
- ketones
- blood
- bilirubin and
- urobilinogen

Fig. 3 . Urine dipstick.

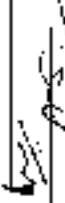


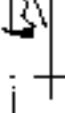
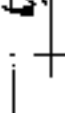
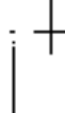

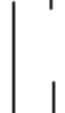







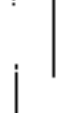




- The main advantage of dipsticks is that they are

1. convenient,
2. easy to interpret,
3. and cost-effective

The main disadvantage is that the

1. Information may not be very accurate as the test is time-sensitive.
2. It also provides limited information about the urine as it is qualitative test and not a quantitative test.

ANNEXURE II - VALUE ADDED COURSE STUDENT DETAILS - URINE ANALYSIS, PA07, FEB - APRIL 2018

S.No	Register No	Students List	SIGN
1	U17MB296	GANJI KARTHIC	
2	U17MB297	GAUTHAMAN.M	
3	U17MB298	GOKULAVANIG K	
4	U17MB299	GOVITHAM B	
5	U17MB300	GRANTHI KARISHMA	
6	U17MB301	GIREESHMA SIAJI K	
7	U17MB302	GUDDATI KOLA SATYA SAINAGA S RAMESH	
8	U17MB303	GURUNATHAN S	
9	U17MB304	HARSH BHARTI	
10	U17MB305	HENRITTA I	
11	U17MB306	HIYA SAIKIA	
12	U17MB307	HRETHICK MANICKAM R	
13	U17MB308	JAYASHREE SAIKIA	
14	U17MB309	JITHU MORIAN	
15	U17MB310	KALLA PRASANTHI KUMAR	
16	U17MB311	KAJAL MISIIRA	
17	U17MB312	KAVIYA EV	
18	U17MB313	KAYANAT FARHEEN	
19	U17MB314	KEVINONO BIO	
20	U17MB315	KEVIN RAHUL S	

RESOURCE PERSON

COORDINATOR

DEPARTMENT OF CHEMISTRY
 ANNA UNIVERSITY, CHENNAI
 PROFESSOR & HEAD OF THE DEPARTMENT
 DR. LAKSHMI DEVI



**SRI LAKSHMI NARAYANA INSTITUTE OF HIGHER EDUCATION
AND RESEARCH**

Annexure - IV

URINE ANALYSIS

SHORT ANSWER QUESTIONS

Course Code: Path, 7-

1. ANSWER ALL THE QUESTIONS

1. Describe physical characteristics of normal urine.
2. Define polyuria.
3. List causes of hematuria.
4. Define principle of Benedict's test.
5. List reagents used in Benedict's solution.
6. Define proteinuria.
7. What are chemical tests to assess proteinuria?
8. What is the function of a urinometer?
9. List advantages of urine dipstick method.
10. What are the tests available for assessing bile salts and pigments in urine?

URINE Analysis

Kerin

Roll: 8

D) Normal urine

95% of the urine is composed water and rest is organic compounds

these include

- urobilinogen
- uric acid
- creatinine
- urea

Inorganic compounds include

Na^+ K^+ Ca^{2+}

carbonates

sulphates

Volume:

The human produce average 1-2 litres of urine per day,

Student Feedback Form

Course Name: URINE ANALYSIS

Subject Code: PA07

Name of Student: Kevin R.

Roll No: _____

Your evaluations, comments are:

Students will help us to improve our performance

Sl. NO	Particulars
1	Objective of the course
2	Course contents met with
3	Lecturer sequence was
4	Lectures were clear and
5	Teaching aids were effective
6	Instructors encouraged and helpful
7	The level of the course
8	Overall rating of the course

	1	2	3	4	5
1				✓	
2				✓	
3				✓	
4				✓	
5				✓	
6				✓	
7				✓	
8					

* Rating: 5 - Outstanding; 4 - Excellent

Grading: 2 - Satisfactory; 1 - Not Satisfactory

Suggestions if any

None

Kevin P.

Signature

Date: _____



Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research

(Deemed to be University under section 3 of the UGC Act 1956)



CERTIFICATE OF MERIT

This is to certify that Kaila Prasanth Kumar has _____

actively participated in the Value Added Course on *Urine analysis* held during FEB-APRIL

2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605

502, India.

DEPARTMENT OF MICROBIOLOGY
Dr. A. Manoharan

RESOURCE PERSON

502, SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES,
PONDICHERRY - 605 502

Dr. Pammy Sinha

COORDINATOR

PROFESSOR & HEAD OF DEPARTMENT
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES,
PONDICHERRY - 605 502



Sri Lakshmi Narayana Institute of Medical Sciences

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CERTIFICATE OF MERIT

This is to certify that Kevin Rahul S has _____

actively participated in the Value Added Course on *Urine analysis* held during FEB-APRIL

2018 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry- 605

502, India.

Dr. A. Manoharan

RESOURCE PERSON

Dr. A. Manoharan
Sri Lakshmi Narayana Institute of Medical Sciences
Pondicherry- 605 002, India.

Dr. Pammy Sinha

COORDINATOR

Dr. Pammy Sinha
Sri Lakshmi Narayana Institute of Medical Sciences
Pondicherry- 605 002, India.

Date: 30.04.2018

From

Dr. Panny Sinha
Professor and Head,
Department of Pathology,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Through Proper Channel

To

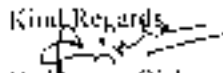
The Dean,
Sri Lakshmi Narayana Institute of Medical Sciences
Bharath Institute of Higher Education and Research,
Chennai.

Sub: Completion of value-added course: Urine Analysis

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: - Urine analysis on Feb to April 2018 for 20 Bsc MLT students. We solicit your kind action to send certificates for the participants, that is attached with this letter. Also, I am attaching the photographs captured during the conduct of the course.

Kind Regards,


Dr. Panny Sinha

Dr. Panny Sinha, Head of Dept.

Department of Pathology

Sri Lakshmi Narayana Institute of Medical Sciences

Bharath Institute of Higher Education and Research,

200A, Sarai junction, Thiruvananthapuram

Certificates

Photographs

