



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

Date 3.1.2019

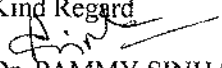
From  
Dr. PAMMY SINHA ,  
HOD  
Pathology  
SriLakshmiNarayanaInstituteofMedicalSciences, Puducherry  
Bharath Institute of Higher Education and Research,  
Chennai.

To  
The Dean,  
SriLakshmiNarayanaInstituteofMedicalSciences, Puducherry  
Bharath Institute of Higher Education and Research,  
Chennai.

**Sub: Permission to conduct value-added course: Synovial fluid and biopsy**

Dear Madam,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled: **Synovial fluid and biopsy** on Feb – April 2019. We solicit your kind permission for the same.

Kind Regard  
  
Dr. PAMMY SINHA

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**FOR THE USE OF DEANS OFFICE**

Names of Committee members for evaluating the course:

The Dean: Dr. Jayalakshmi

The HOD: Dr. PAMMY SINHA

The Expert: Dr. J.PRIYADARSHINI The committee has discussed about the course and is approved.

Dean

(Sign & Seal)

Subject Expert

(Sign & Seal)

HOD

(Sign & Seal)

DEPARTMENT OF PATHOLOGY  
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES,  
PONDICHERRY - 605 003

PROFESSOR & HEAD, DEPT. OF PATHOLOGY  
SRI LAKSHMI NARAYANA INSTITUTE OF  
MEDICAL SCIENCES,  
PONDICHERRY - 605 003



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

**Circular**

10.1.19

**Sub: Organising Value-added Course: Synovial fluid and biopsy**

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 “**Synovial fluid and biopsy**” from feb 2019. 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 31.01.2019 . Applications received after the mentioned date shall not be entertained under any circumstances.

Dean

Encl: Copy of Course content

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

## Course Proposal

Course Title: Synovial fluid and biopsy

**Course Objective:**

1. To define the automation and shall be able to discuss the principle and procedure to be followed in analyzer.
2. Should know about the parts and principle of Analyzer
3. Should be able to run analyzer and should also know about the trouble shooting

**Course Outcome:** Should know about the tissue processing in detail

**Course Audience:** IInd year MBBS

**Course Coordinator:** Dr.Pammy sinha

**Course Faculties with Qualification and Designation:**

1. Dr.J.Priyadarshini , Assistant Professor

2. Dr.V.Saravanakumari , Assistant Professor

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

SlNo	Date	Topic	Time	Faculty	Hours
1.	2.2.2019	NORMAL SYNOVIAL HISTOLOGY	1.30-4 pm	Dr.J.Priyadarshini	2.5 hrs
2.	9.2.2019	FORMATION / FUNCTION	1.30-4 pm	Dr.V.Saravanakumari	2.5 hrs
3.	16.2.2019	NORMAL SYNOVIAL FLUID	1.30-4 pm	Dr.J.Priyadarshini	2.5 hrs
4.	23.2.2019	NORMAL SYNOVIAL CYTOLOGY	1.30-4 pm	Dr.V.Saravanakumari	2.5 hrs
5.	2.3.2019	SYNOVIAL FLUID CONSTITUENTS	1.30-4 pm	Dr.J.Priyadarshini	2.5 hrs
6.	9.3.2019	WHEN IS IT ORDERED? SYNOVIAL FLUID COLLECTION	1.30-4 pm	Dr.V.Saravanakumari	2.5 hrs
7.	16.3.2019	INDICATION FOR SY.BIOPSY	1.30-4 pm	Dr.J.Priyadarshini	2.5 hrs
8.	23.3.2019	SYNOVIAL BIOPSY IN INFLAMMATION	1.30-4 pm	Dr.V.Saravanakumari	2.5 hrs

		<b>Practical Class</b>			
9.	30.3.2019	Physical examination of synovial fluid	1.30-4 pm	Dr.J.Priyadarshini	2.5 hrs
10.	6.4.2019	RECOMMENDED TEST	1.30-4 pm	Dr.J.Priyadarshini	2.5 hrs
11.	13.4.2019	SPECIAL TESTS	1.30-4 pm	Dr.J.Priyadarshini	2.5 hrs
12	20.4.2019	Microscopic analysis of synovial fluid	1.30-4 pm	Dr.V.Saravanakumari	2.5 hrs
		<b>Total</b>			30 hrs

#### REFERENCE BOOKS:

### 1.Clinical Applications of Synovial Biopsy

Antonio Manzo, Serena Bugatti, and Silvia Rossi

### 2.. Diagnostic value of blind synovial biopsy in clinical practice

E. J. A. Kroot, A. E. A. M. Weel, J. M. W. Hazes, P. E. Zondervan, M. P. Heijboer, P. L. A. van Daele, R. J. E. M. Dolhain

## VALUE ADDED COURSE

### 1. Name of the programme & Code

Synovial fluid and biopsy PA10

### 2. Duration & Period

30 hrs Feb -April 2019

### 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 questions- *Enclosed as Annexure- III*

### 6. Certificate model

*Enclosed as Annexure- IV*

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

1 time Feb-April 2019

### 8. Year of discontinuation: 2020

### 9. Summary report of each program year-wise

Value Added Course- Feb-April 2019					
Sl. No	Course Code	Course Name	Resource Persons	Target Students	Strength & Year
1	PA10	Synovial fluid and biopsy	Dr. J.Priyadharisini	IInd MBBS	Feb -April 2019

### 10. Course Feed Back

*Enclosed as Annexure- V*

**RESOURCE PERSON**

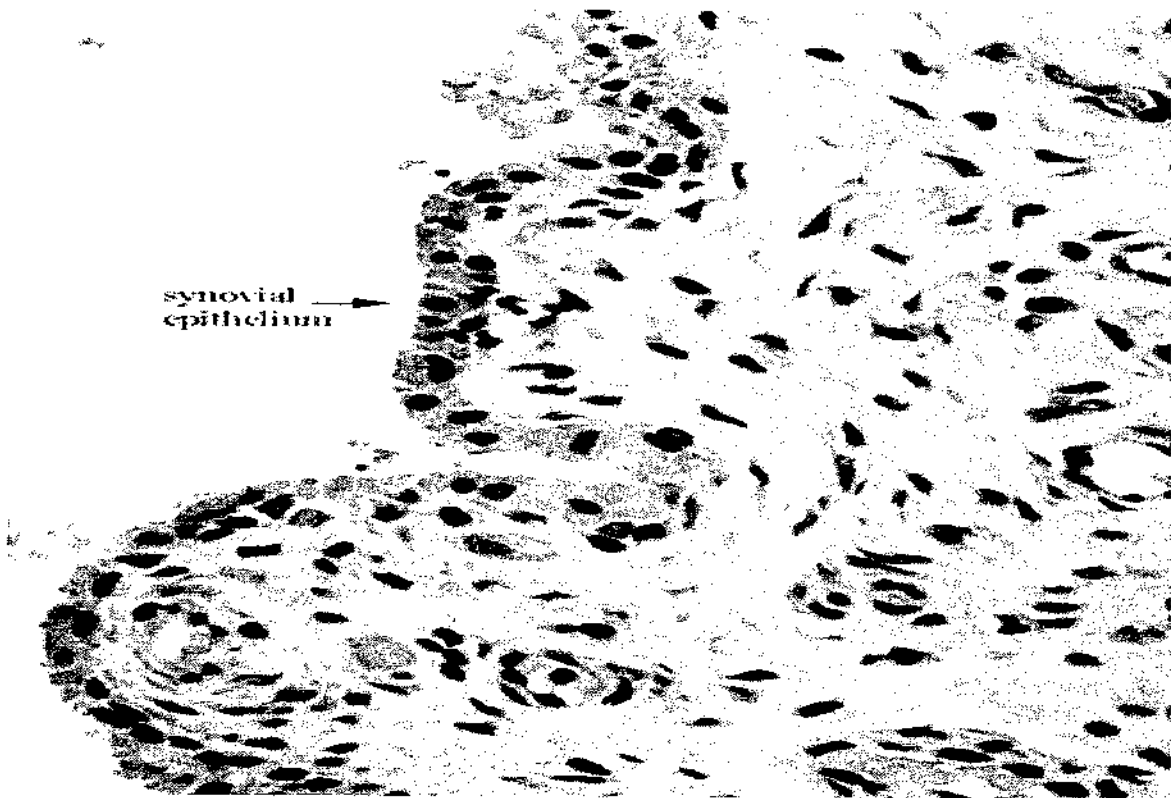
Dr. J.Priyadharisini

**COORDINATOR**

Dr. Pammy Sinha

PROFESSOR & HEAD, DEPT. OF PATHOLOGY  
SRI LAKSHMI NARAYAN INSTITUTE OF  
MEDICAL SCIENCES,  
PUDUCHERRY - 605 002.

## Synovial fluid and biopsy



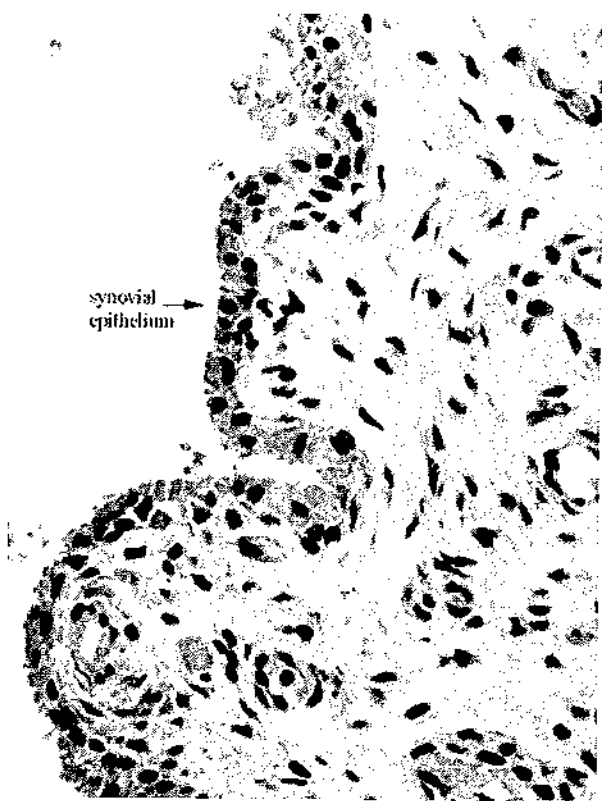
## PARTICIPANT HAND BOOK

## COURSE DETAILS

Particulars	Description
Course Title	SYNOVIAL CYTOLOGY AND BIOPSY
Course Code	PA10
Objective	<ol style="list-style-type: none"> <li>1. NORMAL SYNOVIAL HISTOLOGY</li> <li>2. FORMATION / FUNCTION</li> <li>3. NORMAL SYNOVIAL FLUID</li> <li>4. NORMAL SYNOVIAL CYTOLOGY</li> <li>5. SYNOVIAL FLUID CONSTITUENTS</li> <li>6. WHEN IS IT ORDERED?</li> <li>7. SYNOVIAL FLUID COLLECTION</li> <li>8. RECOMMENDED TESTS</li> <li>9. SPECIAL TESTS</li> <li>10. SYNOVIAL FLUID EXAM</li> <li>11. SYNOVIAL BIOPSY IN INFLAMMATION</li> <li>12. CLINICAL USEFULNESS OF SYNOVIAL FLUID</li> <li>13. LIMITATION FOR SYNOVIAL FLUID CYTOLOGY</li> <li>14. INDICATION FOR SY.BIOPSY</li> <li>15. ROLE OF MOLECULAR TECHNIQUE</li> </ol>
Further learning opportunities	INTERPRETATION OF SYNOVIAL FLUID
Key Competencies	On successful completion of the course the students will have skill in handling and interpretation of synovial fluid
Target Student	II MBBS Students
Duration	30hrs Feb – April2019
Theory Session	20hrs
Practical Session	10hrs
Assessment Procedure	Short notes

NORMAL SYNOVIAL HISTOLOGY :

- SINGLE LAYERED OR DOUBLE LAYERED
- LOW COLUMNAR TO CUBOIDAL EPITHELIUM
- SUB EPI SHOWS FIBRO COLLAGENOUS TISSUE AND THIN WALLED BLOOD VESSELS



- **FORMATION / FUNCTION : SYNOVIOCYTES**
  - synthetic group
  - phagocytic group
- Formed by filtration of plasma
- Exchange between the surrounding cartilage
- SYNOVIAL FLUID



- Produced by synovial membrane
- Viscous fluid
- Lubricant
- Cushions and reduces friction - Knees, shoulders, hips, hands and feet

- **NORMAL SYNOVIAL FLUID:**

- COLOR - Yellow
- CLARITY - Clear
- VISCOSITY - High
- MUCIN CLOT - Firm
- Should not be clotted
- WBC counts should be 0 to 200/cum
- POLYS -- <25
- CRYSTALS - Absent
- CULTURE - Sterile

- **NORMAL SYNOVIAL CYTOLOGY :**

- Scattered cells
- Mono nuclear histiocytes (65%)
- Sparse lymphocytes
- Sparse neutrophils
- Isolated single synovial cells
- Cartilage cells are usually absent
- Background should be clear

**WHEN IS IT ORDERED?**

ARTHROCENTESIS

1. MONOARTHRITIS (acute or chronic)
2. TRAUMA ( with joint effusion)
3. MONOARTHRITIS IN CHRONIC POLYARTHRITIS

#### 4. JOINT INFECTION/ HEMARTHROSIS/CRYSTAL INDUCED ARTHRITIS

##### **SYNOVIAL FLUID COLLECTION**

- **Sterile, disposable needle**
- **Divided in to 3 parts**
- **3 to 10ml into heparinized tube for microbiological studies**
- **2 to 5ml into anticoag.tube for microscopic examination**
- **5ml for chemical analysis**

##### **RECOMMENDED TESTS**

- **ROUTINE TESTS**
- **Gross examination**
- **Total and diff leukocyte counts**
- **Gram stain and culture**
- **Crystal examination with polarized light**

##### **SPECIAL TESTS**

- **Fungal tests**
- **Acid fast tests**
- **PCR for bacterial and mycobacterial DNA**
- **Glucose differential**
- **Lactate and other organic acids**
- **Complement**
- **Enzymes**
- **Uric acid levels**

##### **SYNOVIAL FLUID EXAM**

- **PHYSICAL EXAMINATION**
- **CHEMICAL EXAMINATION**
- **MICROSCOPIC EXAMINATION**
- **EXAMINATION FOR MICROORGANISM**

#### **CLINICAL USEFULNESS OF SYNOVIAL FLUID**

- **RHEUMATOID ARTHRITIS**
- **OSTEOARTHRITIS**
- **TRAUMATIC ARTHRITIS**
- **GOUTY ARTHRITIS**
- **REITERS SYNDROME**
- **FIG. VILLO. SYNOVITIS**
- **SEPTIC ARTHRITIS**

#### **LIMITATION FOR SYNOVIAL FLUID CYTOLOGY**

- **Joints not easy to aspirate (MTP)**
- **Minimal effusion**
- **Painful joint**
- **Crystals not all the time appreciated**
- **Observers experience**
- **Synovial tumors**

#### **INDICATION FOR SY.BIOPSY**

- **If fluid cytology does not CORRELATE with clinical findings**
- **BENIGN LESIONS**
- **Fig.villo.nodular synovitis**
- **Synovial chondromatosis**
- **Synovial hemangioma**
- **Synovial lipoma**
- **MALIGNANT LESIONS**

- **Synovial chondrosarcoma**

- **Malignant tenosynovial giant cell tumor**

#### **ROLE OF MOLECULAR TECHNIQUE**

- **PCR TECH – For mycobacterial TB DNA**
- **ELECTRON MICROSCOPE – For crystal arthritis**
- **GAS LIQUID CHROMATOGRAPHY – For organic acids**

**VALUE ADDED COURSE**  
**SYNOVIAL CYTOLOGY AND BIOPSY**

**List of Students Enrolled- Feb-April 2019, PA10**

2 <sup>nd</sup> Year MBBS Student			Signature
Sl. No	Name of the Student	Roll No	
1	FAUSTINA BAJWIN .S	U18MB291	<i>faustina</i>
2	G SRI SAI NITISH	U18MB292	<i>Nitish</i>
3	GAUR DARSHANA PURUSHOTTAM GAUR	U18MB293	<i>Gaur</i>
4	GHATKAR SAYALL KRISHNA	U18MB294	<i>G. Krishna</i>
5	GOKUL M S	U18MB295	<i>Gokul</i>
6	GOPIKA .P	U18MB296	<i>Goopika</i>
7	HARI BALA SIDDHARTH T.R	U18MB297	<i>Hari Bala</i>
8	HARSHINI R C	U18MB298	<i>harshini</i>
9	HIBA MOIDEEN .K	U18MB299	<i>Hibamoid</i>
10	INDHU S	U18MB300	<i>Indhu</i>
11	INDU V	U18MB301	<i>Indu</i>
12	INDUKURI SAI AKANKSHA	U18MB302	<i>Akanksha</i>
13	IPSITA SETHY	U18MB303	<i>Ipsita</i>
14	JAGADEESAN S.R	U18MB304	<i>Jagadeesan</i>
15	JAHNAVI REDDY .M	U18MB305	<i>Jahnavi</i>
16	JAISHREE .S	U18MB306	<i>Jaishree</i>
17	JANANI V	U18MB307	<i>Janani</i>
18	JASMEET NIRANJAN	U18MB308	<i>Niranjan</i>
19	JAYALAKSHMI S	U18MB309	<i>Jayalakshmi</i>
20	JAYAREDDYGARI SAI RUCHITHA	U18MB310	<i>Jayareddy</i>

**RESOURCE FACULTY**

DEPARTMENT OF PATHOLOGY  
SRM LAKSHMI NARAYAN INSTITUTE OF  
MEDICAL SCIENCES  
PONDICHERRY - 605 002

**COORDINATOR**

PROFESSOR & HEAD, DEPT. OF PATHOLOGY  
SRM LAKSHMI NARAYAN INSTITUTE OF  
MEDICAL SCIENCES,  
PONDICHERRY - 605 002



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

**Synovial fluid and biopsy**

**Course Code: PA 10**

**I. ANSWER ANY SIX QUESTIONS**

1. NORMAL SYNOVIAL FLUID CONSTITUENTS
2. WHEN IS IT ORDERED?
3. SYNOVIAL FLUID COLLECTION METHOD
4. SYNOVIAL FLUID EXAM
5. SYNOVIAL BIOPSY IN INFLAMMATION
6. CLINICAL USEFULNESS OF SYNOVIAL FLUID
7. LIMITATION FOR SYNOVIAL FLUID CYTOLOGY
8. INDICATION FOR SY. BIOPSY
9. ROLE OF MOLECULAR TECHNIQUE

# SYNOVIAL FLUID CYTOLOGY.

Faustina Bajarin, S

U18MB291

Roll No. 40

24/20

Q. Answer the questions:-

1. Normal synovial fluid constituents.

Normal synovial fluid contains 3-4 mg/ml hyaluronan (hyaluronic acid), a polymer of disaccharides composed of D-glucuronic acid and D-N-acetylglucosamine joined by alternating beta-1,4 and beta 1,3 glycosidic bonds.

Normal synovial fluid is straw-colored, clear and slightly sticky or stringy. Abnormal synovial fluid may be cloudy and thicker or thinner than normal fluid. Cloudiness could mean there are crystals, excess white blood cells, or microorganisms in the fluid. If you have gout, the fluid will contain crystals.

2. Normal synovial fluid ordered.

Color and clarity may vary. Normal synovial fluid is clear and colorless or straw-colored. Abnormal fluid may look cloudy, opaque, and for differently colored. For example, cloudy fluid may indicate an infection, and pink or reddish fluid may indicate the presence of blood.

# Synovial Fluid and Bursa

20/3/20

1. Normal synovial fluid contains 3-4 mg/ml hyaluronic acid a polymer of disaccharides composed of D-glucuronic acid and D-N acetylglucosamine joint by alternating beta 1,4 and 1,3 glycosidic bonds.

3. Numb the area around the affected joints using the local anesthetic injection or a numbing spray. insert a needle and syringe into the joint between the two bones draw out a small sample of synovial fluid through the syringe and deposit it into a container send the sample to a laboratory for analysis.

4. Synovial fluid also known as joint fluid is thick liquid located between your joints. The fluids cushion the bone and reduce the friction when you move your joints.

An exam of physical quantities of fluid such as color or texture.



# SYNOVIAL FLUID CYTOLOGY.

Faustina Bajwin - 8

U18MB291

Roll No. 40

24/90

2. Answer the questions:-

1. Normal synovial fluid constituents.

Normal synovial fluid contains 3-4 mg/ml hyaluronan (hyaluronic acid), a polymer of disaccharides composed of D-glucuronic acid and D-N-acetylglucosamine joined by alternating beta-1,4 and beta 1,3 glycosidic bonds.

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## Synovial fluid and biopsy

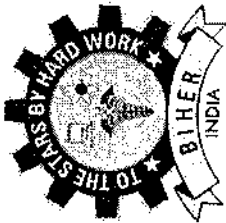
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3. Numb the area around the affected joints using the local anesthetic injection or a numbing spray. insert a needle and syringe into the joint between the two bones draw out a small sample of synovial fluid through the syringe and deposit it into a container send the sample to a laboratory for analysis.

4. Synovial fluid also known as joint fluid is thick liquid located between your joints. The fluid cushion the bone and reduce the friction when you move your joints.

Another exam of physical quantities of fluid such as - white or thicker.



# 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 Janani.V has

actively participated in the Value Added Course on Synovial fluid and biopsy held during Feb

– April 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry -  
605 502, India.

Dr. J. **PRAYADHARISINI**

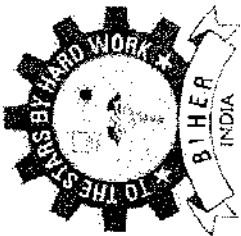
**RESOURCE PERSON**

DEPARTMENT OF PATHOLOGY  
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES  
PONDICHERRY - 605 502

Dr. **PAMMY SINHA**

**COORDINATOR**

POST GRADUATE HEAD, DEPT. OF PATHOLOGY  
SRI LAKSHMI NARAYANA INSTITUTE OF MEDICAL SCIENCES  
PONDICHERRY



# Sri Lakshmi Narayana Institute of Medical Sciences

Affiliated to Bharath Institute of Higher Education & Research  
(Deemed to be University, Under section 3 of the U.C.E. Act 1956)



## CERTIFICATE OF MERIT

This is to certify that HARSHINI R.C has

actively participated in the Value Added Course on synovial fluid and biopsy held during

Feb – April 2019 Organized by Sri Lakshmi Narayana Institute of Medical Sciences,

Pondicherry- 605 502, India.

Dr. J. PRIYADHARISINI

RESOURCE PERSON

DEPARTMENT OF PATHOLOGY  
SRI LAKSHMI NARAYANA INSTITUTE OF  
MEDICAL SCIENCES,  
PONDICHERY - 605 502.

Dr. PAMMY SINHA

COORDINATOR

PROFESSOR & HEAD, DEPT. OF PATHOLOGY  
SRI LAKSHMI NARAYANA INSTITUTE OF  
MEDICAL SCIENCES,  
PONDICHERY - 605 502.

## Student Feedback Form

Course Name: SINOVIAL FLUID AND BIOPSY

Subject Code: PA10

Name of Student: Harshini RC Roll No.: V18MB298

We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear		/			
2	Course contents met with your expectations			/		
3	Lecturer sequence was well planned			/		
4	Lectures were clear and easy to understand		/			
5	Teaching aids were effective			/		
6	Instructors encourage interaction and were helpful			/		
7	The level of the course		/			
8	Overall rating of the course	1	2	3	4	5

\* Rating: 5 - Outstanding; 4 - Excellent; 3 - Good; 2 - Satisfactory; 1 - Not-Satisfactory

Suggestions if any:

Nil.

*Harshini*  
Signature

Date: 20.4.2020

## Student Feedback Form

Course Name: SINOVIAL FLUID AND BIOPSY

Subject Code: PA10

Name of Student: Indu . S Roll No.: UIBMB300

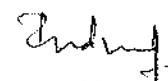
We are constantly looking to improve our classes and deliver the best training to you. Your evaluations, comments and suggestions will help us to improve our performance

Sl. NO	Particulars	1	2	3	4	5
1	Objective of the course is clear				✓	
2	Course contents met with your expectations				✓	
3	Lecturer sequence was well planned				✓	
4	Lectures were clear and easy to understand				✓	
5	Teaching aids were effective				✓	
6	Instructors encourage interaction and were helpful					✓
7	The level of the course			✓		
8	Overall rating of the course	1	2	3	4 ✓	5

\* Rating: 5 - Outstanding; 4 - Excellent; 3 - Good; 2 - Satisfactory; 1 - Not-Satisfactory

Suggestions if any:

Nil.
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Signature

Date: 20.4.2020

Date: 30.04.2019

From

Dr.Pammy 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

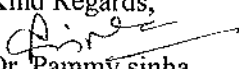
The Dean,  
Sri Lakshmi Narayana Institute of Medical Sciences  
Bharath Institute of Higher Education and Research,  
Chennai.

**Sub: Completion of value-added course: Synovial fluid and biopsy**

Dear Sir,

With reference to the subject mentioned above, the department has conducted the value-added course titled: **Synovial fluid and biopsy** in IInd MBBS Feb –April 2019 - for 80 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. Pammy sinha

PROFESSOR AND HEAD OF DEPARTMENT  
SR. LAKSHMI NARAYANA INSTITUTE OF  
MEDICAL SCIENCES,  
KODUCHERRY - 605 002.

Encl: Certificates

**Photographs**

