Sri Lakshmi Narayana Institute of Medical Sciences

Osudu, Agaram Village, Kudapakkam post, Puducherry – 605 502

Department of Anatomy

Date:02.04.2018

From

Dr. Somasundaram L Lalitha

Professor and Head,

Department of Anatomy,

Sri Lakshmi Narayana Institute of Medical Sciences

BIHER

Puducherry

To

The Dean

Sri Lakshmi Narayana Institute of Medical Sciences

BIHER

Puducherry

Sub: Permission to conduct value-added course: Anatomy in perfusion technology

Dear sir,

With reference to the subject mentioned above, the department proposes to conduct a value-added course titled **Anatomy in perfusion technology** for 1st year **MBBS** students in May 2018. We solicit your kind permission for the same.

Kind Regards

FOR THE USE OF DEANS OFFICE

Names of Committee members for evaluation of the course:

1. Dr. Deans Dr. Sugumaran. A

2. Dr. HOD. Dr. Somashekar. L. Dalawai

3. Dr. Expert. Dr. Anitha. B

The committee has discussed about the course and is approved

Dean

Subject Expert

HOD

OFFICE OF THE DEAN

Sri Lakshmi Narayana Institute of Medical Sciences

OSUDU, AGARAM VILLAGE, VILLIANUR COMMUNE, KUDAPAKKAM POST,
PUDUCHERRY - 605 502

[Recognised by Medical Council of India, Ministry of Health vide No. U-12012/240/2005-ME (P-II) dt. 11/09/2006]
(Affiliated to Bharath University, Chennai - 73)

Circular

16.04.2018

Sub: Organising Value-added Course on Anatomy in perfusion technology. reg

With reference to the above mentioned subject, it is to bring to your notice that Sri Lakshmi Narayana Institute of Medical Sciences, Puducherry affiliated by Bharath Institute of Higher Education and Research is organizing a value added course on **"Anatomy in perfusion technology" during May 2018 for 1st year MBBS students(2017-2018)**. The course content for the same is enclosed below.

Dean

(Dr. Sugumaran. A)

Each Copy of Course content

COURSE CONTENT

Particulars	Description
Course Title	Anatomy in perfusion technology
Course Code	ANA08
Topics and content of the course in the Hand book	1. Introduction to respiratory and circulatory system 2. Introduction to life support equipments 3. Thoracic cage and intercostal space 4. Surface anatomy of heart, lung and major blood vessels 5. Anatomy of lung and pleura 6. Heart – external and internal features 7. pericardium 8. Major blood vessels of heart 9. Kidney, ureter and urinary bladder – external and internal features 10. Cardiopulmonary perfusion 11. Role of perfusionist 12. Application of Anatomy in perfusion technology
Advantages of learning and	In-depth knowledge of Anatomy and its application

evaluation	
Further learning Opportunities	Advanced techniques in perfusion technology
Key Competencies	On successful completion of the course the students will have skill in handling emergency procedures
Target Student	1st MBBS
Duration	30 hours, May- June 2018
Theory Session	22hrs
Practical Session	8 hrs
Assessment Procedure	Short answer questions

COURSE PROPOSAL

Course Title:

Anatomy in perfusion technology

Course Objective:

1. Learn gross features of organs
2. Application of anatomical knowledge in perfusion technology
3. Knowledge of equipments used in perfusion technology

Course Outcome:

Clear knowledge of anatomy improve the skills during emergency situations

Course Audience: I[st] year MBBS

Course Coordinator: Dr Somashekar. L Tolanur

Course Faculties with Qualification and Designation:

1. Dr. Anitha. B, MD Anatomy, Assistant professor
2. Dr. B. Rajesh. Msc ph.d , Professor Anatomy,
3. Dr. Shanthini. S, MD Anatomy, Assistant professor

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

Sl No	Date	Topic	Name of the faculty	Time	Hours
1.	01.05.2018	Introduction to Respiratory and circulatory system	Dr. Anitha.B	2- 5 pm	3 hours
2.	05.05.2018	Introduction to life support equipments	Dr. Anitha. B	2-5 pm	3 hours
3.	08.05.2018	Thoracic cage & Intercostal space	Dr. Anitha. B	2-5 pm	3 hours
4.	12.06.2018	Anatomy of Lung and pleura	Dr. B. Rajesh	2-5 pm	3 hours
5.	15.05.2018	Demonstration of Lung and Pleura	Dr. B. Rajesh	2-5 pm	3 hours
6.	19.05.2018	Heart – External and internal features. Pericardium and Major blood vessels of heart	Dr. Shanthini. S	2-5 pm	3 hours
7.	22.05.201	Demonstration of Heart	Dr	2-4pm	2

	8		Shanthini. S		hours
8.	22.05.2018	Kidney, ureter and urinary bladder- External and Internal features	Dr. Shanthini. S	4-5 pm	1 hour
9	26.05.2018	Cardiopulmonary perfusion	Dr. Anitha. B	2-5 pm	3 hours
10.	29.05.2018	Role of perfusionist	Dr. Anitha. B	2-5 pm	3 hours
11	02.06.2018	Application of Anatomy in perfusion technology	Dr. Anitha. B	2-5 pm	3 hours
		Total			30 hrs

REFERENCE BOOKS:

1 BD Chaurasia's Human Anatomy

2 Vishram singh Textbook of Anatomy

VALUE ADDED COURSE

1. **Name of the programme & Code**

   Anatomy in perfusion technology

2. **Duration & Period**

   30 hrs & May – June 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 answer question *Enclosed as Annexure III*

6. **Certificate model**

   Enclosed as Annexure IV

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

   Once : May – June 2018

8. **Year of discontinuation:** 2019

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

Value Added Course- Anatomy in perfusion technology-May- June 2018

Sl. No	Course Code	Course Name	Resource Persons	Target Students	Strength & Year
1	VSAA08	Anatomy in perfusion technology	Dr. Anitha B Dr. B. Rajesh Dr. Shanthini S	I MBBS	20 students May - June 2018

10. **Course Feed Back**

    Enclosed as Annexure V

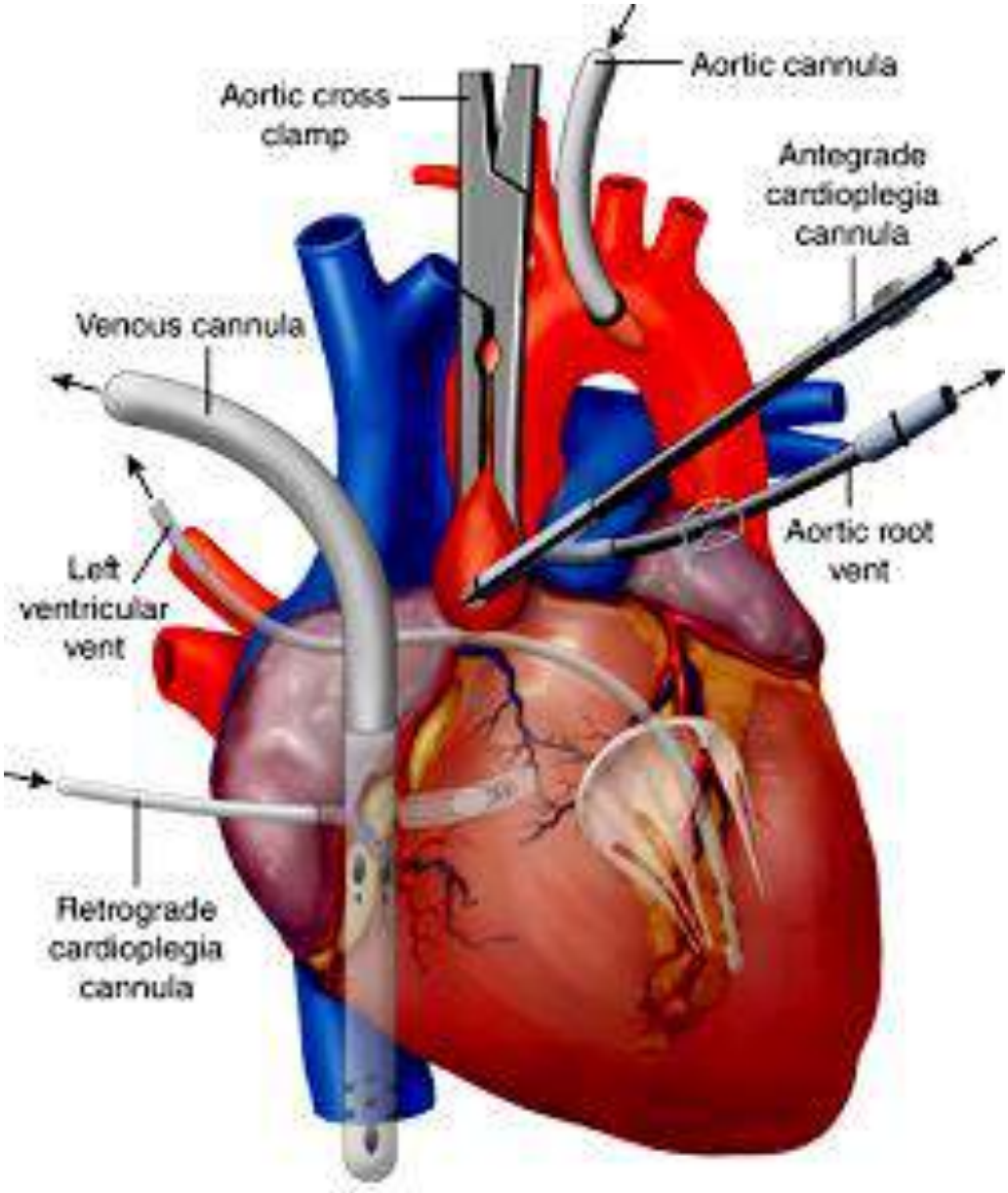
RESOURCE PERSON

1. Dr. Anitha. B
2. Dr. B. Rajesh
3. Dr. S. Shanthini

COORDINATOR

Dr. Soundarakumar. L Balakumar

ANATOMY IN PERFUSION TECHNOLOGY



BIHER SLIMS

Annexure- I

COURSE DETAILS

Particulars	Description
Course Title	Anatomy in perfusion technology
Course Code	ANA08
Topics and content of the course in the Hand book	1. Introduction to respiratory and circulatory system **2.** Introduction to life support equipments **3.** Thoracic cage and intercostal space **4.** Surface anatomy of heart, lung and major blood vessels **5.** Anatomy of lung and pleura **6.** Heart – external and internal features **7.** pericardium **8.** Major blood vessels of heart **9.** Kidney, ureter and urinary bladder – external and internal features **10.**cardiopulmonary perfusion **11.**Risk to patient **12.**Role of perfusionist **13.** Application of Anatomy in perfusion technology
Advantages of learning and evaluation	In-depth knowledge of Anatomy and its application
Further learning Opportunities	Functional anatomy

Key Competencies	On successful completion of the course the students will have skill in handling emergency procedures
Target Student	1st MBBS Students
Duration	30 hours, May- June 2018
Theory Session	22 hour
Practical Session	8 hour
Assessment Procedure	Short answer question

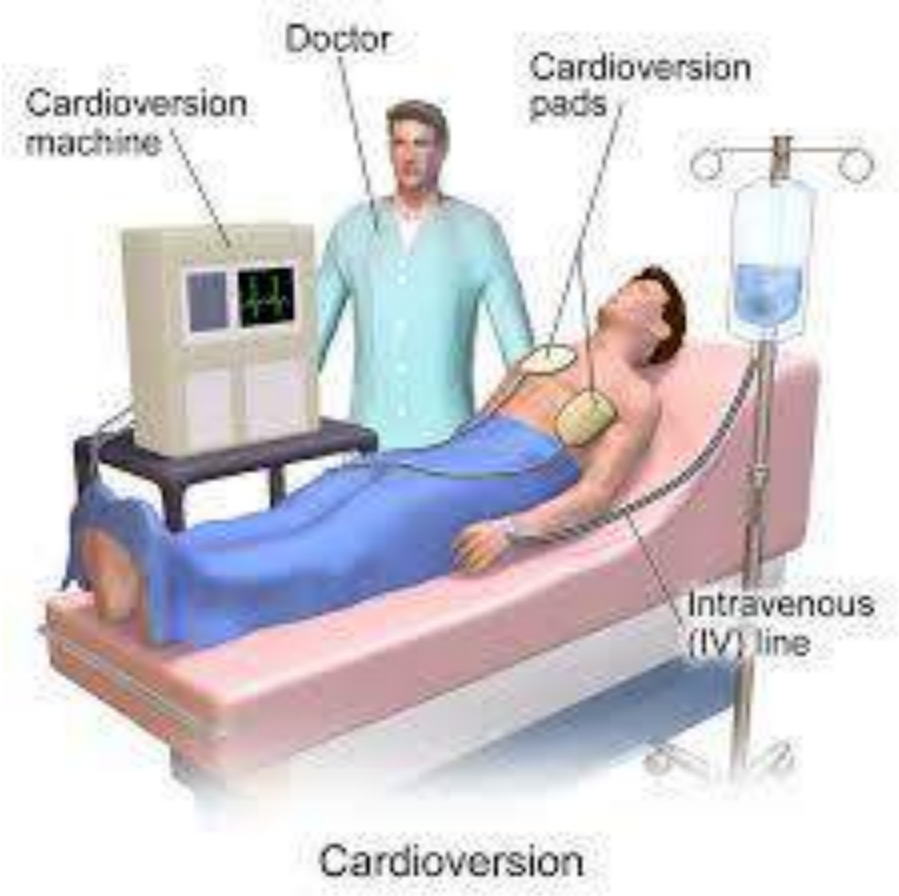
Introduction

Open heart surgery is one of the most highly technical of all modern medical techniques, and includes procedures such as coronary artery bypass grafting, cardiac valve repair or replacement, correction of congenital defects, resection of aneurysms, ablation of abnormal pathways of conduction, etc. It relies on the coordinated interaction of a heart surgeon, an anesthesiologist, several nurses and technicians, and a perfusionist.

The first successful open heart surgery was performed in Philadelphia forty years ago by Dr. John Gibbon, Jr., whose wife, Mary, was his perfusionist. This historical landmark came after two decades of laboratory exploration and perfection of their extracorporeal circuit and its ability to sustain life. Perfusion, the technology which has evolved from those groundbreaking discoveries, controls, supports and maintains the circulation by application of extracorporeal devices.

During open-heart surgery, perfusion (cardiopulmonary bypass - CPB) supplements the functions of the heart and lungs to provide the surgeon with a still, dry operating field. Today, this highly specialized role is performed by individuals conversant in a variety of scientific modalities working in close communication and cooperation with the surgeon. Perfusionists understand the anatomy, pathology, and physiology of the patient, while administering medications, anesthetics, blood, blood components and blood substitutes.

Simultaneously, they operate a highly sophisticated electromechanical device to substitute for the human heart and lungs. Today's perfusionists know and utilize aspects of varied pursuits which include a functional comprehension of machines and motors, electronics and electrical safety, plastics and biocompatibility, drugs and pharmacology, blood and its components, hemodynamics and fluid dynamics, hypothermia and hyperthermia, gas exchange and metabolism, electrolytes and blood compatibility, anticoagulation and anesthesia.

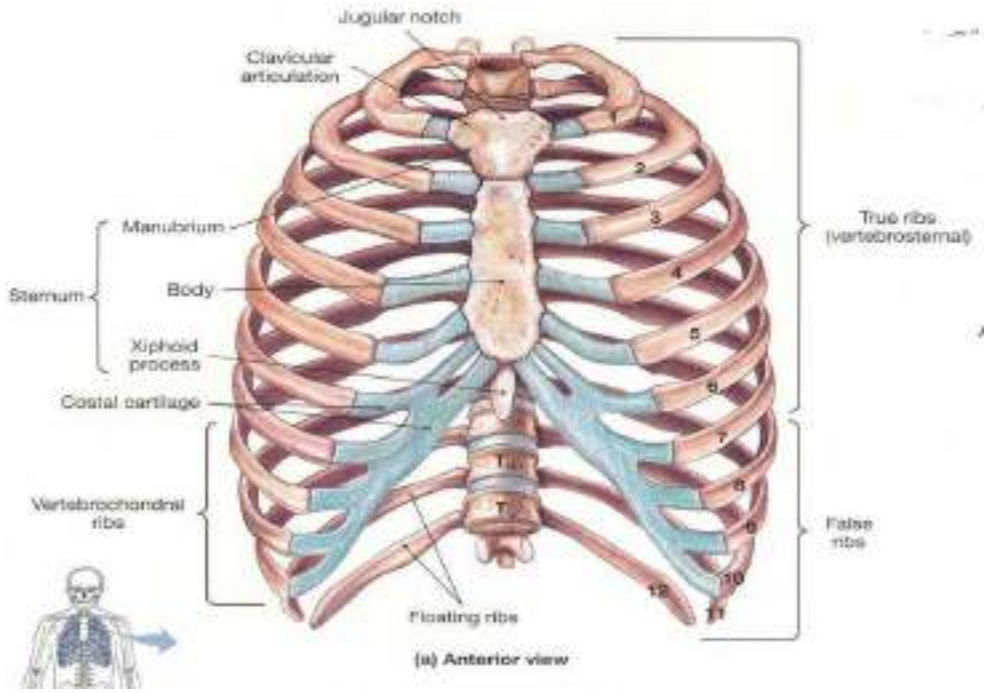


Cardioversion

Gross Anatomy:

Thoracic cage

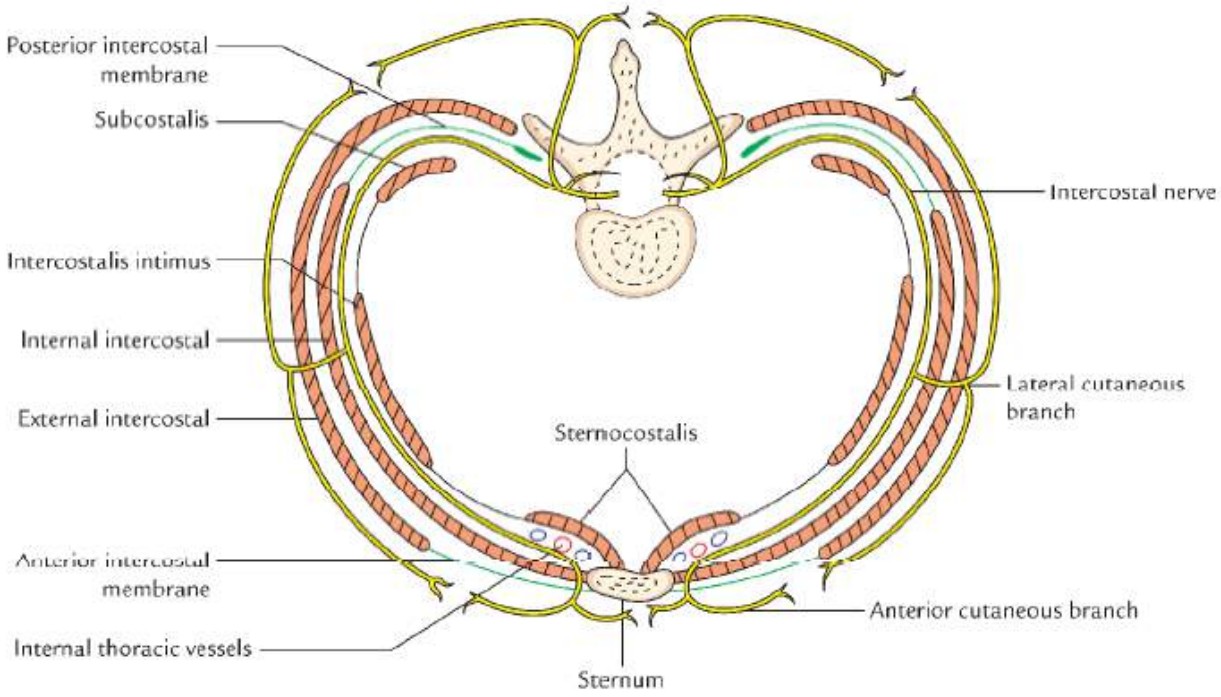
The thoracic cage (human rib cage) is a bony and cartilaginous structure which surrounds the thoracic cavity and supports the pectoral girdle, forming a core portion of the human skeleton.



Intercostal space and muscles

The intrinsic muscles of the chest wall are the intercostal muscles, subcostalis, transversus thoracis, levatores costarum, serratus posterior superior and serratus posterior inferior. The intercostal muscles occupy each of the intercostal spaces and are named according to their surface relations, i.e. external, internal and innermost. All except levatores costarum are innervated by the adjacent intercostal nerves derived from the ventral rami of the thoracic spinal nerves; levatores costarum are innervated by the dorsal rami of the thoracic spinal nerves. The intrinsic muscles can elevate or depress the ribs, and are active during respiration, particularly forced respiration: their primary action is

believed to be to stiffen the chest wall, preventing paradoxical movement during inspiration .



Pleura

The right and left pleural cavities are separate compartments on either side of the mediastinum. Each encloses a lung and its associated bronchial tree and vessels, nerves and lymphatics. The walls are formed by a serous membrane, the pleura, arranged as a closed sac.. The lungs do not fill this space in quiet respiration, but move into recesses such as the costodiaphragmatic recess, which separates the costal and diaphragmatic pleura, in deep breathing.

Lungs

The lungs are the essential organs of respiration. They are situated on either side of the heart . Each lung is free in its pleural cavity, except for its attachment to the heart and trachea at the hilum and pulmonary ligament respectively. The adult right lung usually weighs 625 g, and the left 565 g, but the range of wet

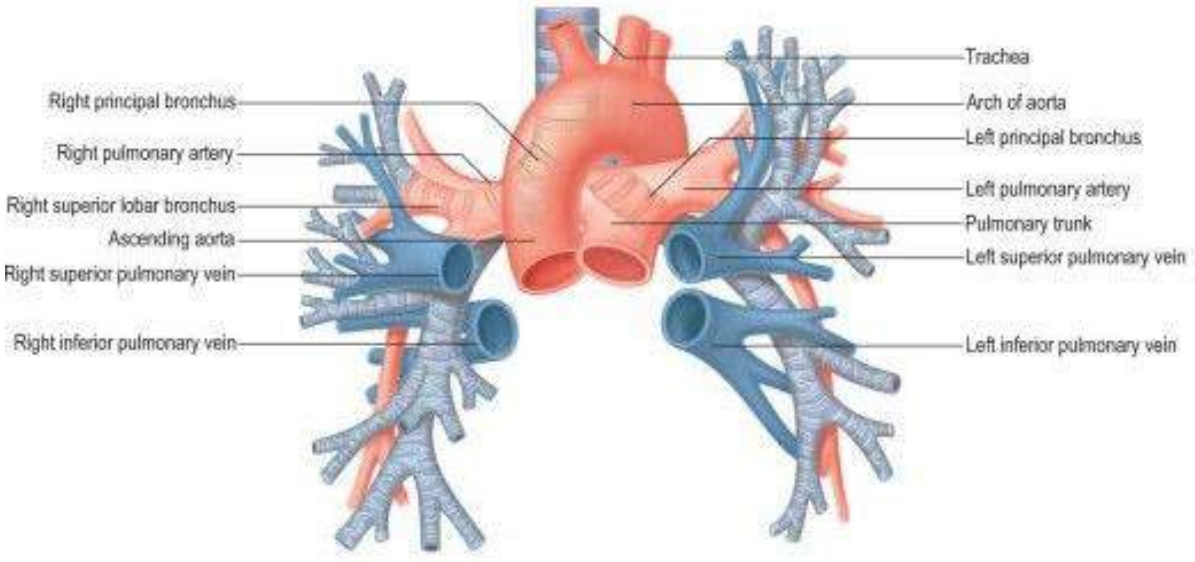
weights is considerable, not least because it reflects the amount of blood or serous fluid contained within the lungs when weighed.

Pulmonary surface features

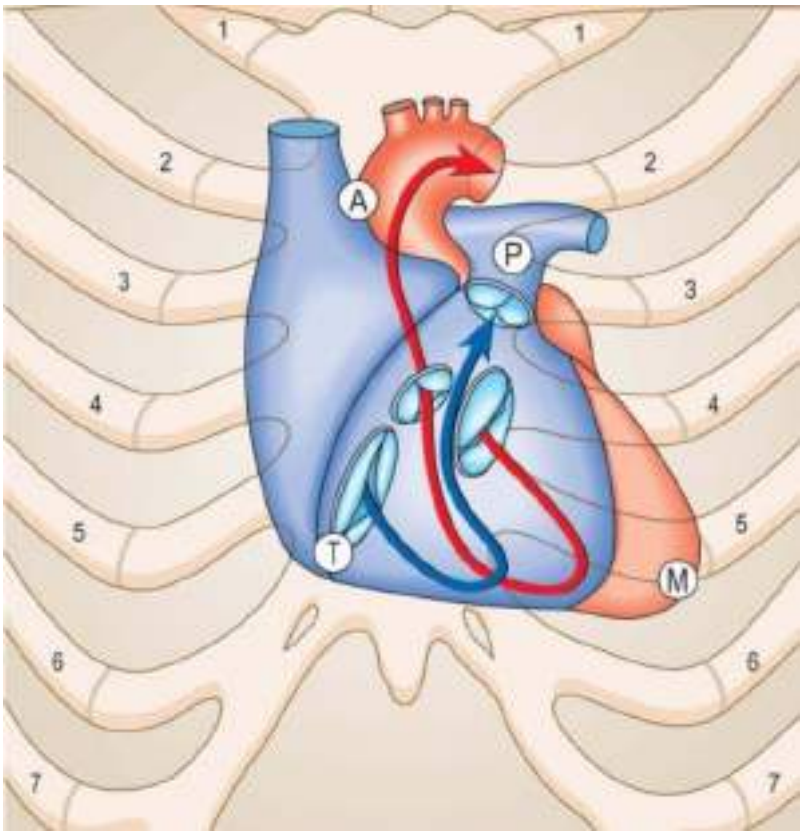
Each lung has an apex, base, three borders and two surfaces. In shape, each lung approximates to half a cone.

Vascular supply and lymphatic drainage

The lungs have two functionally distinct circulatory pathways. The pulmonary vessels convey deoxygenated blood to the alveolar walls and drain oxygenated blood back to the left side of the heart, and the much smaller bronchial vessels, which are derived from the systemic circulation, provide oxygenated blood to lung tissues that do not have close access to atmospheric oxygen, i.e. those of the bronchi and larger bronchioles.



Location of heart in thoracic cavity



PERICARDIUM

The pericardium contains the heart and the juxtacardiac parts of its great vessels. It consists of two components, the fibrous and the serosal pericardium.

Heart

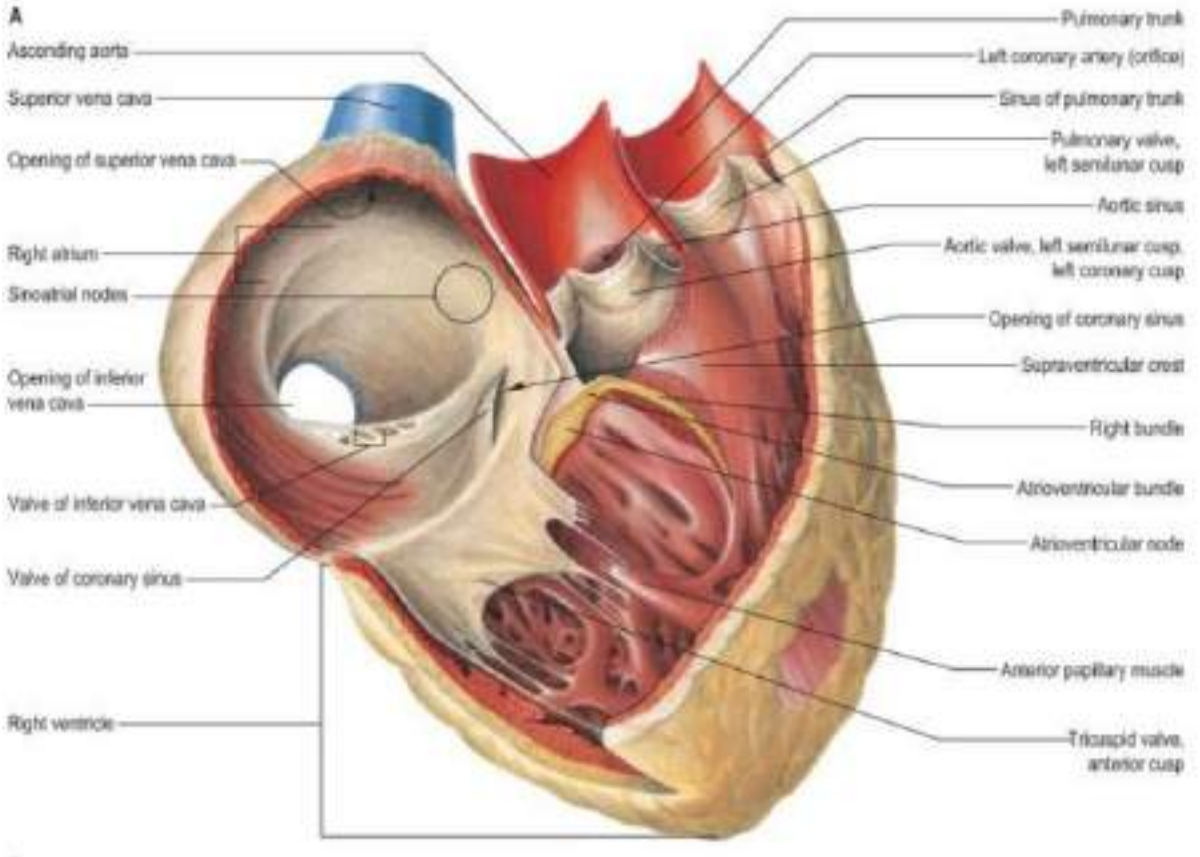
The heart is a pair of valved muscular pumps combined in a single organ (Fig. 56.2A–D). Although the fibromuscular framework and conduction tissues of these pumps are structurally interwoven, each pump (the so-called ‘right' and ‘left' hearts) is physiologically separate, and is interposed in series at different points in the double circulation. Despite this functional disposition in series, the two pumps are usually described topographically in parallel.

Of the four cardiac chambers, the two atria receive venous blood as weakly contractile reservoirs for final filling of the two ventricles, which then provide

the powerful expulsive contraction that forces blood into the main arterial trunks.

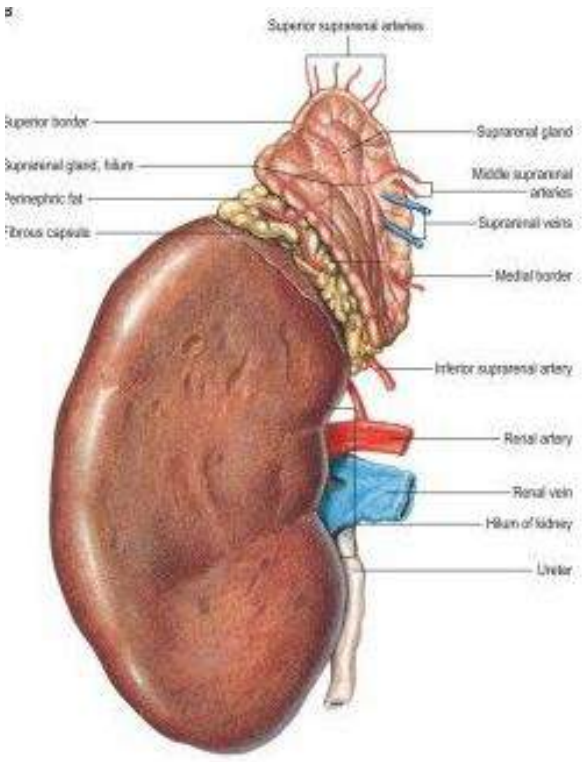
Cardiac size, shape and external features

The heart is a hollow, fibromuscular organ of a somewhat conical or pyramidal form, with a base, apex and a series of surfaces and ‘borders'. Enclosed in the pericardium, it occupies the middle mediastinum between the lungs and their pleural coverings (Fig. 56.1). It is placed obliquely behind the body of the sternum and the adjoining costal cartilages and ribs. Approximately one-third of the mass lies to the right of the midline.



The right and left coronary arteries arise from the ascending aorta in its anterior and left posterior sinuses. The levels of the coronary ostia are variable. The two arteries, as indicated by their name, form an oblique inverted crown, in which an anastomotic circle in the atrioventricular groove is connected by marginal and interventricular (descending) loops intersecting at the cardiac apex. This is, of course, only an approximation. The degree of anastomosis varies and is usually insignificant. The main arteries and major branches are usually subepicardial, but those in the atrioventricular and interventricular grooves are often deeply sited, and occasionally hidden by overlapping myocardium or embedded in it.

Excretory system



The kidneys excrete the end products of metabolism and excess water. These actions are essential for the control of concentrations of various substances in the body, maintaining electrolyte and water balance approximately constant in the tissue fluids. The kidneys also have endocrine functions, producing and releasing erythropoietin, which affects red blood cell formation; renin, which influences blood pressure; 1,25-di-hydroxycholecalciferol (the metabolically active form of vitamin D), which is involved in the control of calcium absorption and mineral metabolism; and various other soluble factors with metabolic actions.

In the fresh state, the kidneys are reddish-brown. They are situated posteriorly behind the peritoneum on each side of the vertebral column and are surrounded by adipose tissue. Superiorly they are level with the upper border of the 12th thoracic vertebra, inferiorly with the third lumbar vertebra. The right is usually slightly inferior to the left, reflecting its relationship to the liver. The left is a little longer and narrower than the right and lies nearer the median plane.The long axis of each kidney is directed inferolaterally and the transverse axis posteromedially, which means that the anterior and posterior aspects usually described are in fact anterolateral and posteromedial. An appreciation of this orientation is important in percutaneous and endo-urologic renal surgery.

Cardio pulmonary perfusion

Blood pumps propel the blood through the extracorporeal circuit and return it to the total volume of blood in the circuit via suction. Usually, three pumps arc used. The arterial pump returns oxygenated blood to the patient and may operate at a flow rate of up to 6 L/ min, depending on the size of the patient. A backup arterial pump is usually provided. The two other pumps in the system are used to generate suction to return blood from the surgical site to the cardiotomy reservoir. Since continuous operation is imperative, a backup

battery pack as well as connection to the emergency power system are necessary.

The oxygenator,* cardiotomy reservoir, arterial filter, and tubing are the disposable components that form the extracorporeal blood circuit for the perfusion. Blood taken from the venae cavae normally flows by gravity to the venous side of the oxygenator where it is oxygenated and its temperature is controlled. This blood flows through the defoamer of the oxygenator to the arterial reservoir of the oxygenator. The arterial blood pump returns the blood to the patient, and then may pass it through a blood line filter before it reaches the patient.

A shunt is incorporated around the blood line filter to permit flow if the filter must be changed. Blood at the surgical site is returned to the patient by suction pumps. Intracardiac suckers return blood to the cardiotomy reservoir where it is filtered and then drained or pumped to the venous side of the oxygenator. Blood from the cardiotomy reservoir may be passed through an additional blood line filter before it is returned to the oxygenator. The tubing set described is usually specified by the perfusionist and made up as a sterile custom pack by the tubing manufacturer

Risks to the patient

One of the greatest risks to the patient during cardiopulmonary bypass is embolism-the inadvertent introduction of air (or other gas or particulate matter) into the patient's circulation. Gross air emboli (1 mL or greater) in the arterial circulation can cause serious injury and death. The effects of smaller emboli are not fully understood

There are several patient and equipment variables that must be controlled and monitored during perfusion. The temperature of the blood in the extracorporeal

circuit is altered to produce hypothermia or normothermia in the patient's body. A heat exchanger is normally incorporated in the oxygenator and water must be delivered to the exchanger at a specified temperature. A mixer is used to proportion the incoming hot and cold water to be delivered to the exchanger. These mixers usually incorporate a thermometer to give temperature readings. Oxygen, used to oxygenate the venous blood, may be delivered from tanks or a central piped oxygen system. A flowmeter and bacteriologic filter are usually incorporated into the oxygen circuit. The oxygen content of the blood may be monitored by blood gas determinations from drawn samples or by using an in-line differential oxygen monitor. Temperature monitors may be used, with probes placed at various points on the patient and/or in the extracorporeal circuit, and the temperature is displayed at the main console. Level detectors may be used to monitor the blood in the oxygenator. These detectors may give audible and visual alarms and may also stop the arterial blood pump if the blood level in the oxygenator is low, in order to avoid pumping air into the patient, or too high to prevent excessive blood in the exsanguinator. Pressure monitors record left atrial, pulmonary artery, and systemic arterial pressures. These monitors may be included in a central console or they may be attached to other pressure monitoring equipment.

The role of the perfusionist

The most important monitor for air or other matter in the extracorporeal circuit that can cause emboli is the perfusionist. Cardiopulmonary perfusion is not a straightforward, predictable, controlled procedure. Constant vigilance by the perfusionist is required, and, if other responsibilities or activities distract the perfusionist during the procedure, the risks to the patient are increased. Some surgical personnel may wrongly assume that the perfusion equipment runs itself once it is set up, and so may ask the perfusionist to perform other tasks during surgery. This is a very dangerous practice, and should be avoided. There have

been many patient injuries or deaths because of operator inattention during the procedure, improper connection of the equipment, or defective equipment. (The arterial pump, operating at 6 Llmin, can empty the oxygenator of 1000 cc of blood in 10 seconds. During the short amount of time that the perfusionist may turn away from the machine, air may be allowed to enter the system.] It is possible that many of these incidents could have been prevented had the equipment been thoroughly checked for integrity and proper connection, and had the perfusionist continuously monitored the equipment during the procedure

Protocol

The protocols should describe the procedures for preparing, performing, and concluding bypass. These policies should consider all aspects of the perfusion and should be periodically reviewed and updated. As a minimum, they should address: • Responsibilities (who does what) • Surgical protocols • Anesthesia protocols • The extracorporeal and cardioplegia circuits • Equipment selection and use • Monitoring of coagulation activity. perfusion pressures and rates, suction procedures. acid base balance, blood gases. and temperature In addition to describing the conduct of normal perfusion, procedures should be described for dealing with emergencies that arise during cardiopulmonary bypass. These include, but are not limited to: • Air embolism • Defective extracorporeal component(s) • Electrical power failure • Inability to wean from bypass • Altered hemodynamics • Excessive blood loss • Blood damage • Other clinical manifestations There should also be protocols describing high risk equipment and recommending supervision during their use. This equipment includes: • Autotransfusion devices • Defibrillators • Intra-aortic balloon pumps • Plasmapheresis equipment • Pacemakers Development and implementation of these protocols will allow better communication and more effective responses from the surgeon. perfusionist, and anesthesiologist during open-heart surgery procedures.

The perfusionist must have access to the perfusion setup and to information on blood pressure and blood chemistry throughout the perfusion. The perfusion setup and pressure monitoring equipment must be in the direct view of the perfusionist. The perfusionist should be able to view the mean arterial and left atrial pressures (value and waveform) while simultaneously viewing the oxygenator, cardiotomy reservoir, arterial blood filter, and extracorporeal tubing. Team perfusion may help prevent or minimize the severity of perfusion problems. Information on blood clotting time and chemistry (pH and electrolytes) and blood gases should be available on a "stat" basis (within 5 minutes). If this cannot be achieved using the hospital lab, the hospital should consider purchasing blood gas equipment for the surgical suite. In some hospitals, perfusionists maintain their own equipment. It is kept in the OR between procedures, and may never be inspected by anyone other than the user. This is not a safe practice. Care of cardiopulmo238 The Journal of Extra-Corporeal Technology nary perfusion ~quipment should be part of the hospital's equipment control program. If perfusion is provided by an outside contract service, the hospital should make sure that the equipment is properly maintained. As part of a preventive maintenance program, the following should be considered: • Complete inventory of all equipment used in perfusion • Initiation and documentation of inspection (including performance testing), preventive maintenance, and repair of equipment used in perfusion • Establishment of complete documentation for all equipment in the form of an Equipment Control Record (ECR). This record should include equipment history, operator's and service manuals, maintenance service and repair information, and hazard and recall information. • All equipment maintenance and repair data should be communicated between biomedical engineering and the perfusion staff periodically to ensure proper preventive maintenance and confidence in equipment performance. All vendor-provided services should be carefully monitored.

References

1. B.D. Chaurasia's Human Anatomy
2. Vishram singh- Text book of Anatomy
3. Hospital Risk Control Risk Analysis: Cardiopulmonary Perfusion Equipment. Smith bukline. The Journal of Extra-Corporeal Technology. Volume 19, Number 2, Summer 1987

Annexure- II

VALUE ADDED COURSE

Anatomy in perfusion technology and ANA08

List of Students Enrollist - May – June 2018

I st Year MBBS Student

Sl. No	Name of the Student	Roll No	Signature
1	AARTHISEKAR . D	U17MB252	
2	AARYA R BABU	U17MB253	
3	ABHIJITH K	U17MB254	
4	ABHISHEIK J	U17MB255	
5	ABHISHEK KUMAR VISWAKARMA	U17MB256	
6	ADITYA RAI	U17MB257	
7	ADWIZA RAI	U17MB258	
8	AFZAN.M	U17MB259	
9	AGARWAL RIDHAM RAJESHBHAI	U17MB260	
10	AISWARYA.S.NAIR	U17MB261	
11	BHAVYA GUPTA	U17MB281	
12	BRAHMA PRAKASH MISHRA	U17MB282	
13	CHINMAY DODANI	U17MB283	
14	CHRISTO VINCENT.V	U17MB284	
15	CHIYASHREE.G	U17MB285	
16	DEBIA BERMIN	U17MB286	
17	DEEPIKAA E.D	U17MB287	
18	DHANUSS JEEVAN SRIDARAN	U17MB288	
19	DHIREN.S	U17MB289	
20	DHWANI SOLANKI	U17MB290	

RESOURCE PERSON

1. Dr. Arunkumar

2. Dr. B. Ramesh

3. Dr. Shanthini.S

COORDINATOR

Dr. Somashekar.I Talawar

SRI LAKSHMI NARAYANA INSTITUE OF HIGHER EDUCATON AND RESEARCH

Annexure - III

VALUE ADDED COURSES

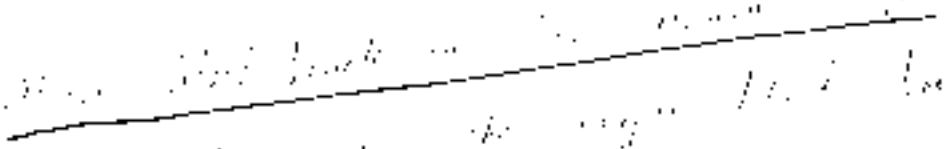
ANATOMY IN PERFUSION TECHNOLOGY

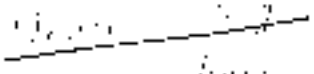
Short answer questions

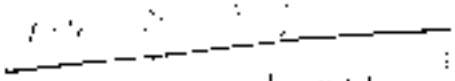
Course code:ANA08

Answer all the questions (10x2 = 20)

1. Name the Major blood vessels in the human body
2. Pleural cavity
3. Aorta and its branches
4. Equipments used in perfusion technology
5. Surface landmarks of heart and lung
6. Role of perfusionist
7. External and internal features of heart
8. Renal circulation
9. Risks to patient during perfusion
10. Mechanism of respiraton







Student Feedback Form

Course Name: **Anatomy in perfusion technology**

Subject Code: **ANA08**

Name of Student: _____ Roll No.: _____

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 content 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:

Signature

Date:

Student Feedback Form

Course Name: Anatomy in perfusion technology

Subject Code: ANA08

Name of Student: _____ Roll No : _____

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 :

Signature

Date:

Date: 07.06.2018

From

Dr. Somasekar L. Hiskani

Professor and Head,

Department of Anatomy,

Sri Lakshmi Narayana Institute of Medical Sciences

BIHER

Puducherry

To

The Dean,

Sri Lakshmi Narayana Institute of Medical Sciences

BIHER

Puducherry

Sub: Completion of value-added course: Anatomy in perfusion technology

Dear Sir,

With reference to the subject mentioned above, the department of Anatomy has conducted the value-added course titled: **Anatomy in perfusion technology** for the I MBBS students during May- June 2018. We solicit your kind action to send certificates for the participants, whose list is attached with this letter. Also I am attaching the photographs captured during the conduct of the course.

Kind Regards

Dr. Somasekar L. Hiskani

Encl: Participants list

Photograph

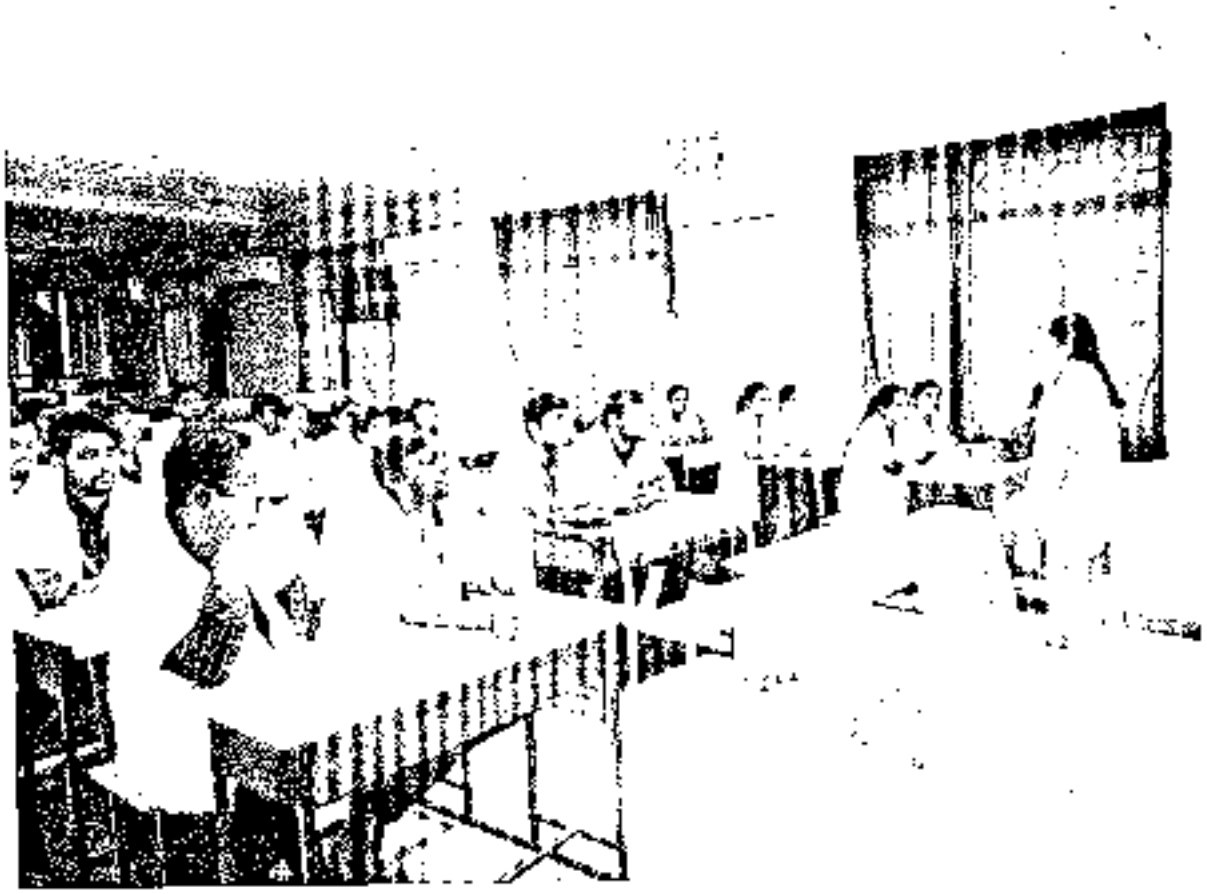
VALUE ADDED COURSE

ANATOMY IN PERFUSION TECHNOLOGY

Participants list

1st Year MBBS Student

Sl. No	Name of the Student	Roll No
1	AARTHISEKAR . D	U17MB252
2	AARYA R BABU	U17MB253
3	ABHIJITH.K	U17MB254
4	ABHISHEIKJ	U17MB255
5	ABHISHEK KUMAR VISHWAKARMA	U17MB256
6	ADITYA RAI	U17MB257
7	ADWIZA RAI	U17MB258
8	AFZAN.M	U17MB259
9	AGARWAL RIDHAM RAJESHBHAI	U17MB260
10	AISWARYA.S.NAIR	U17MB261
11	BHAVYA GUPTA	U17MB281
12	BRAHMA PRAKASH MISHRA	U17MB282
13	CHINMAY DODANI	U17MB283
14	CHRISTO VINCENT.V	U17MB284
15	CIBIYASHREE.G	U17MB285
16	DEBIA JERMIN	U17MB286
17	DEEPIKAA R.D	U17MB287
18	DHANUSS BHUVAN SRIDARAN	U17MB288
19	DHIREN.S	U17MB289
20	DHWANI SOLANKI	U17MB290



This is to certify that AFZAN. M has actively participated in the Value Added Course on Anatomy in perfusion technology held during May - June 2018 Organized by Department of Anatomy, Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry - 605 502, India.

Dr. Anitha. B	Dr. B. Rajesh	Dr Shilpini.S	Dr Somashekar.S. Devanur	Dr. V. Sugumaran
RESOURCE PERSON	RESOURCE PERSON	RESOURCE PERSON	COORDINATOR	

This is to certify that AISWARYA.S.NAIR has actively participated in the Value Added Course on Anatomy in perfusion technology held during May - June 2018 Organized by Department of Anatomy, Sri Lakshmi Narayana Institute of Medical Sciences, Pondicherry - 605 502, India.

Dr Anitha B	Dr. D. Rajesh	Dr Shanthini.S	Dr.Somashekar.I. Tolanur	Dr. A. Sugunaran
RESOURCE PERSON	RESOURCE PERSON	RESOURSE PERSON	COORDINATOR	