YENEPOYA

(DEEMED TO BE UNIVERSITY)
Recognized under Sec 3(A) of the UGC Act 1956
Accredited by NAAC with 'A' Grade

2.3.2 Has provision for the use of Clinical Skills Laboratory and Simulation Based Learning

Any additional information

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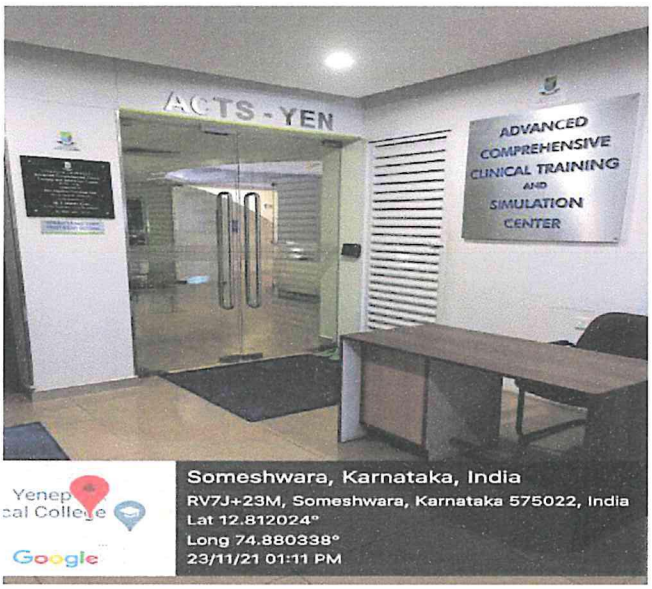
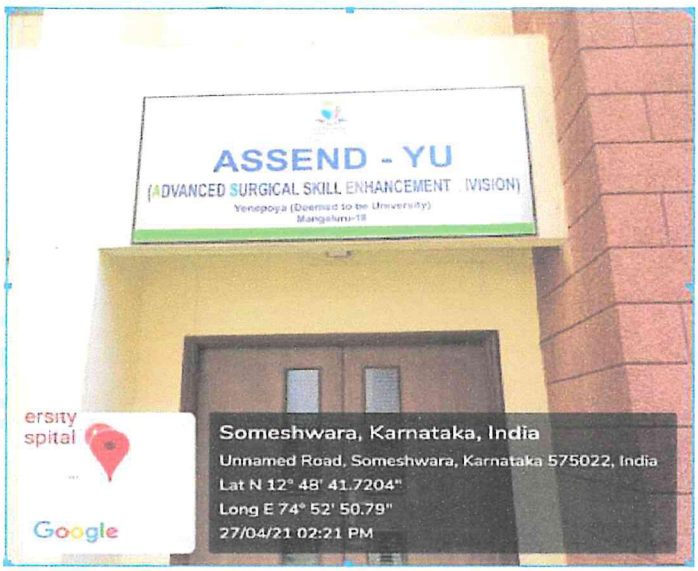
Videos of Clinical Skill Lab Facility

Advanced Comprehensive Clinical Training and Simulation Centre (ACTSYEN) Videos:



https://yenepoya.edu.in/NAAC/2/2.3.2/Acts_Yen.mp4

Advanced Surgical Skill Enhancement Division (ASSEND) Videos:



https://yenepoya.edu.in/NAAC/2/2.3.2/ASSEND_1.mp4

https://yenepoya.edu.in/NAAC/2/2.3.2/ASSEND_2.mp4

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Geo tagged photos of ACTS YEN

ACTS YEN
Advance Comprehensive Clinical Training & Simulation Centre

Advance Comprehensive Clinical Training and Simulation Centre

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University Road, Deralakatte
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Yenepoya University, University Road, Deralakatte, Mangalore-575018. Phone: +91 824 2206000, Fax: +91 824 2204867

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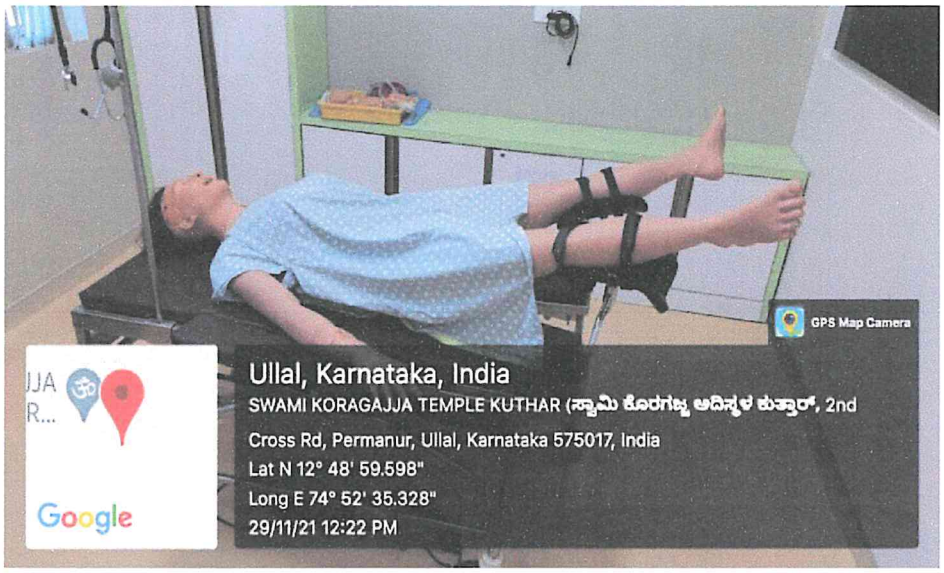
HIGH FIDELITY SIMULATORS

Human Patient Simulator(HPS)

Paediatric and Infant Simulator

Metiman



Maternal Fetal Simulator(MFS)

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University Road, Deralakatte
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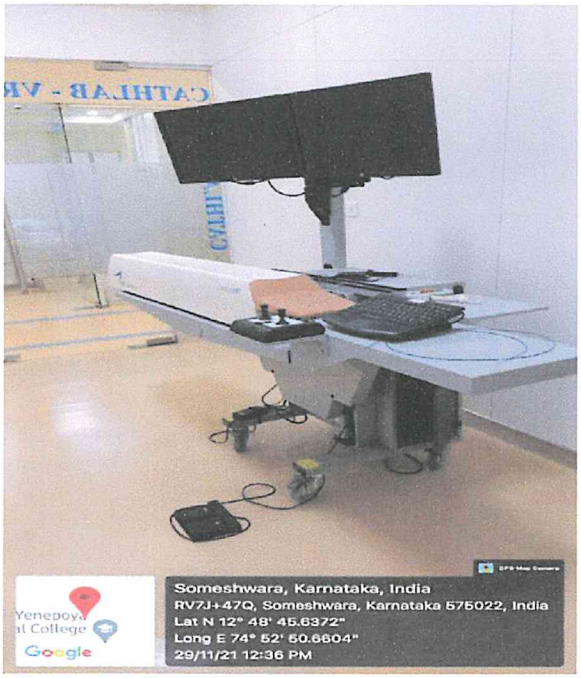
VIRTUAL REALITY SIMULATORS

Laparoscope trainer

Endoscope trainer



Cathlab

Suturing

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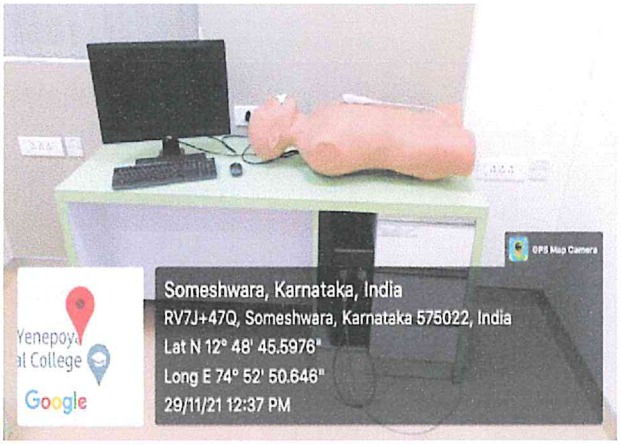
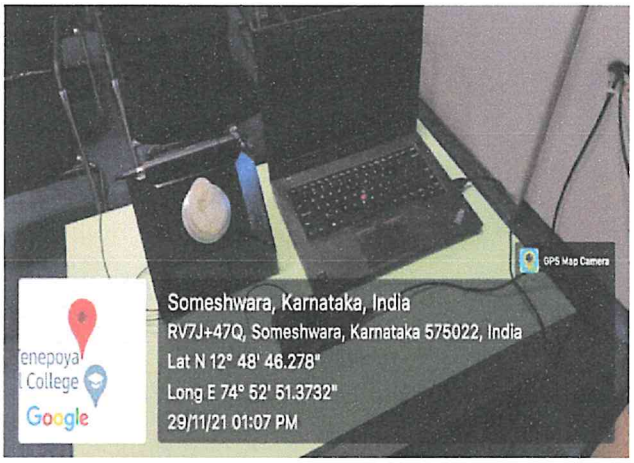
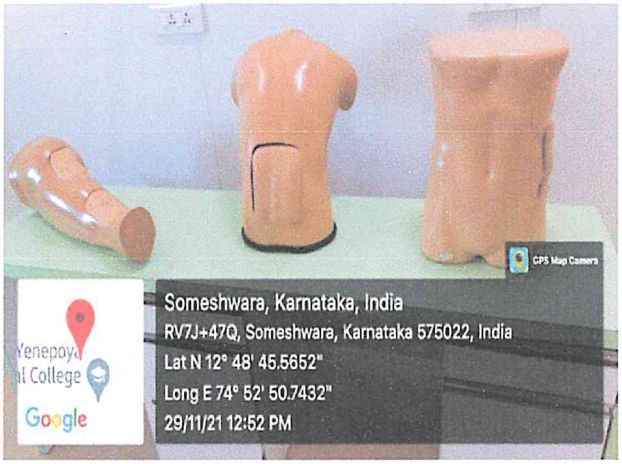


Ultra sound – OBG & ECHO



Ophthal/Oto sim



Blue Phantoms

VIRTUAL DISSECTION TABLE -Anatomage Table

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Registrar
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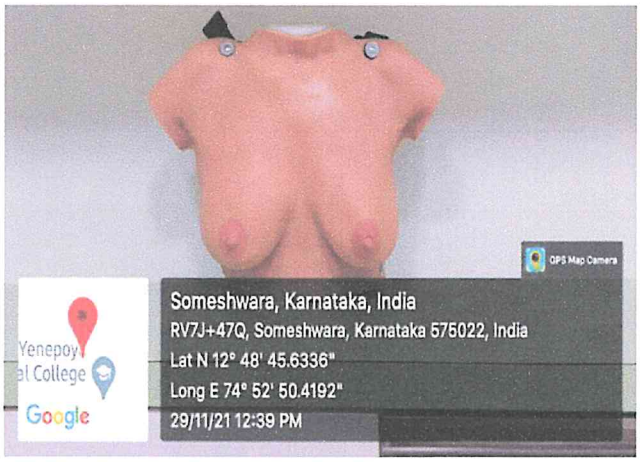
University Road, Deralakatte

TASK TRAINERS

IV & IM Injections

Intubation head

Rectal Examination



Breast Examination

Female pelvic trainer

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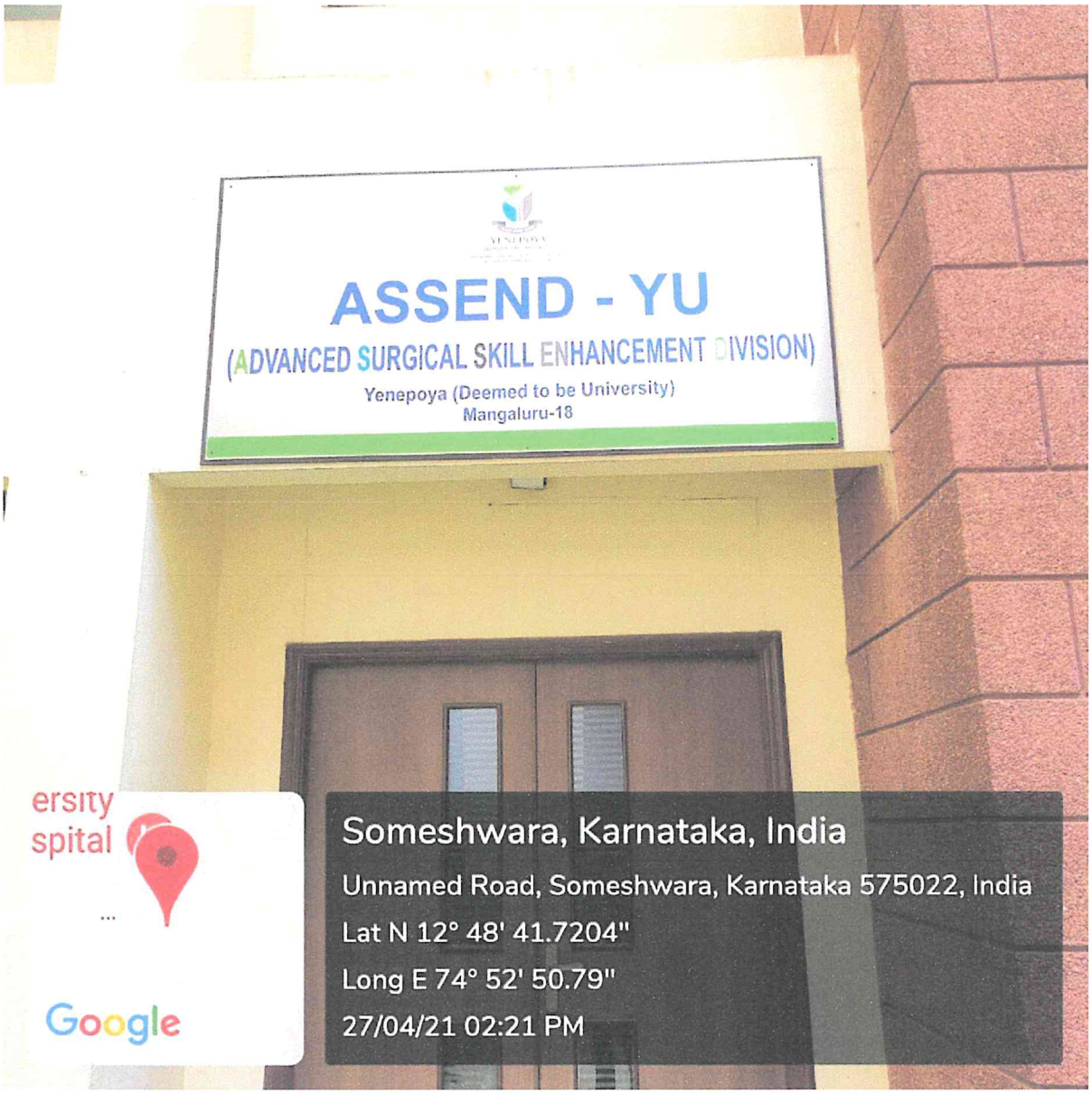
Geo tagged photos of ASSEND

ADVANCED SURGICAL SKILL ENHANCEMENT DIVISION (ASSEND YU)



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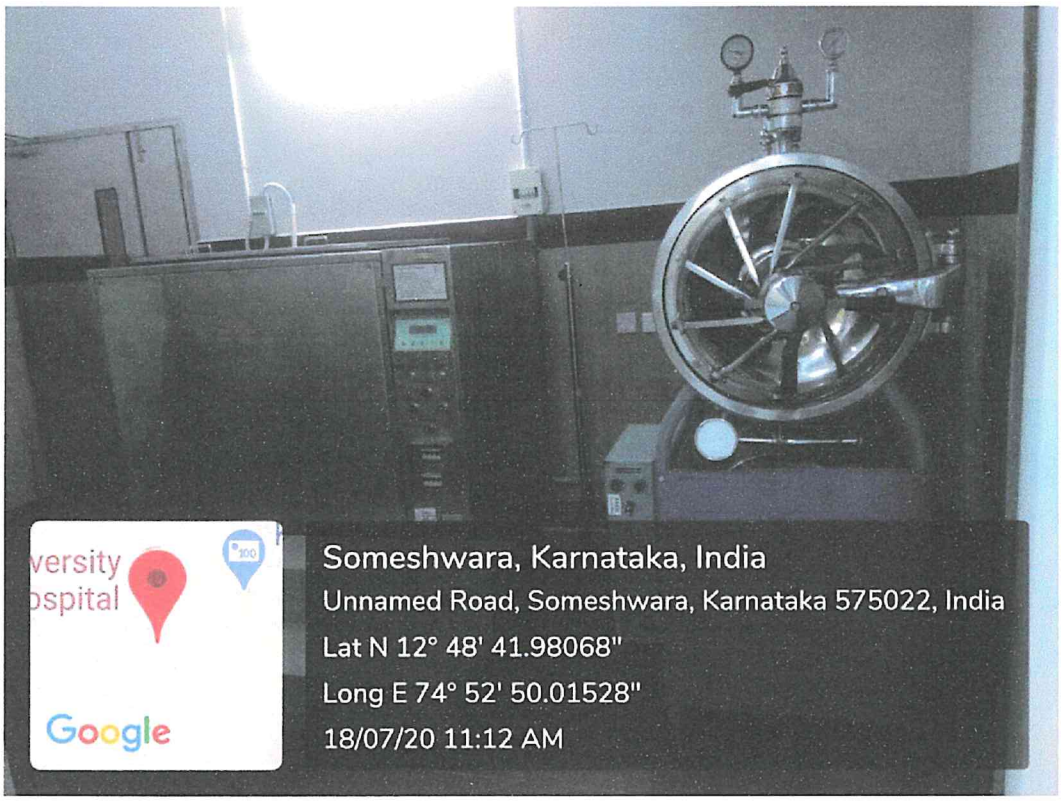
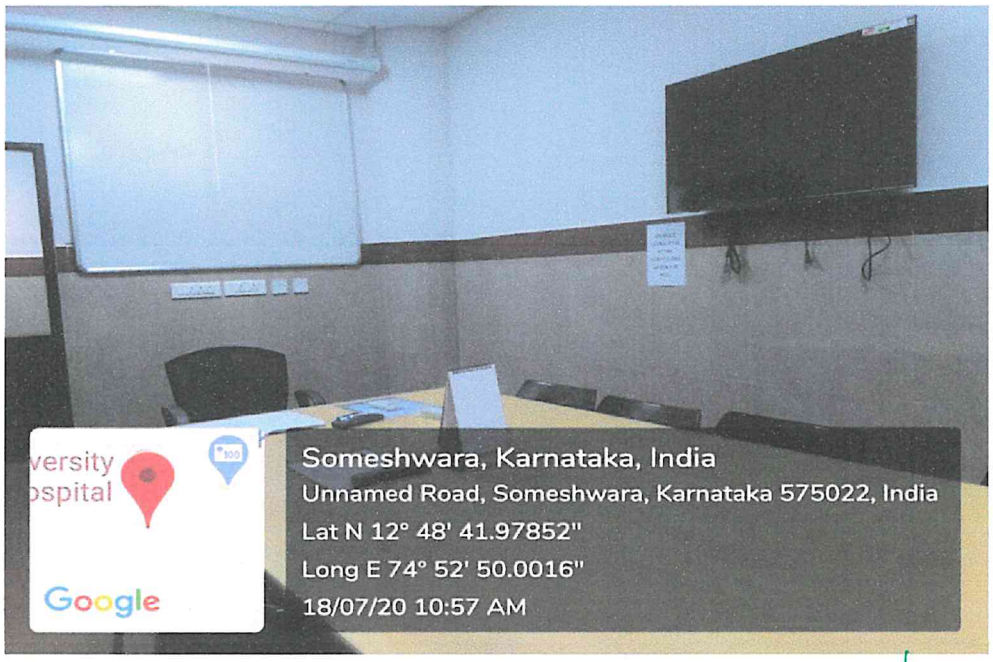
ADVANCED SURGICAL SKILL ENHANCEMENT DIVISION (ASSEND YU)

Autoclave / Sterilization Area



Board room



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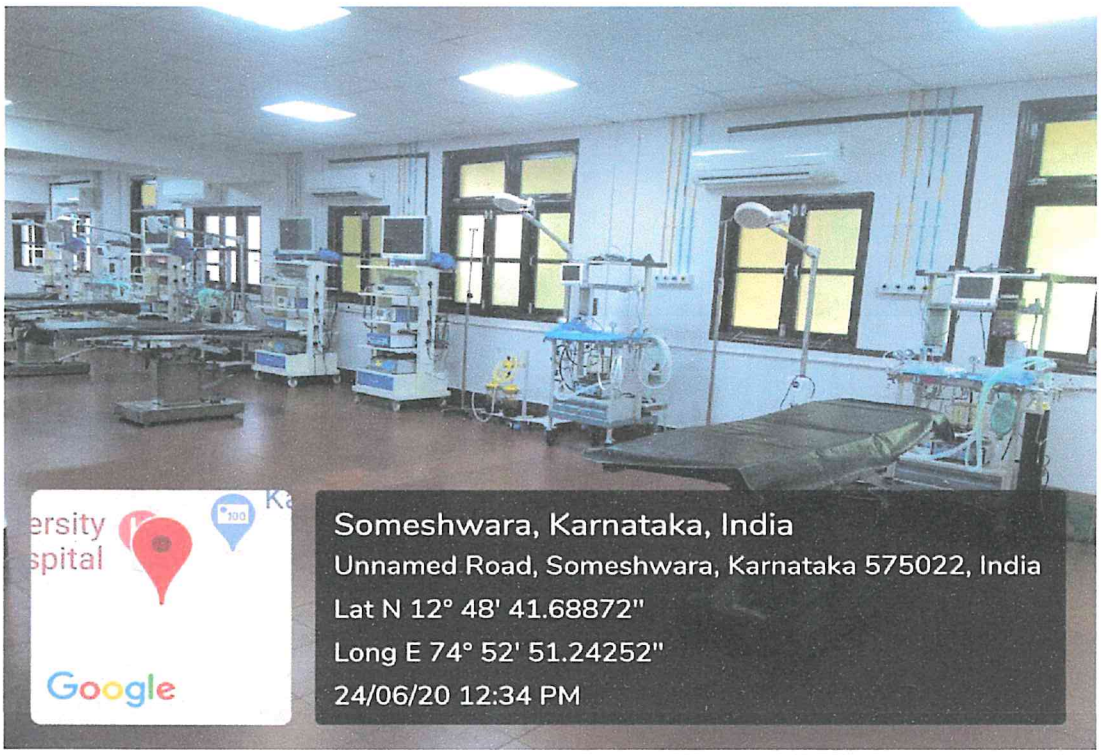
ADVANCED SURGICAL SKILL ENHANCEMENT DIVISION (ASSEND YU)

Endo-training area

Laparoscopic Unit



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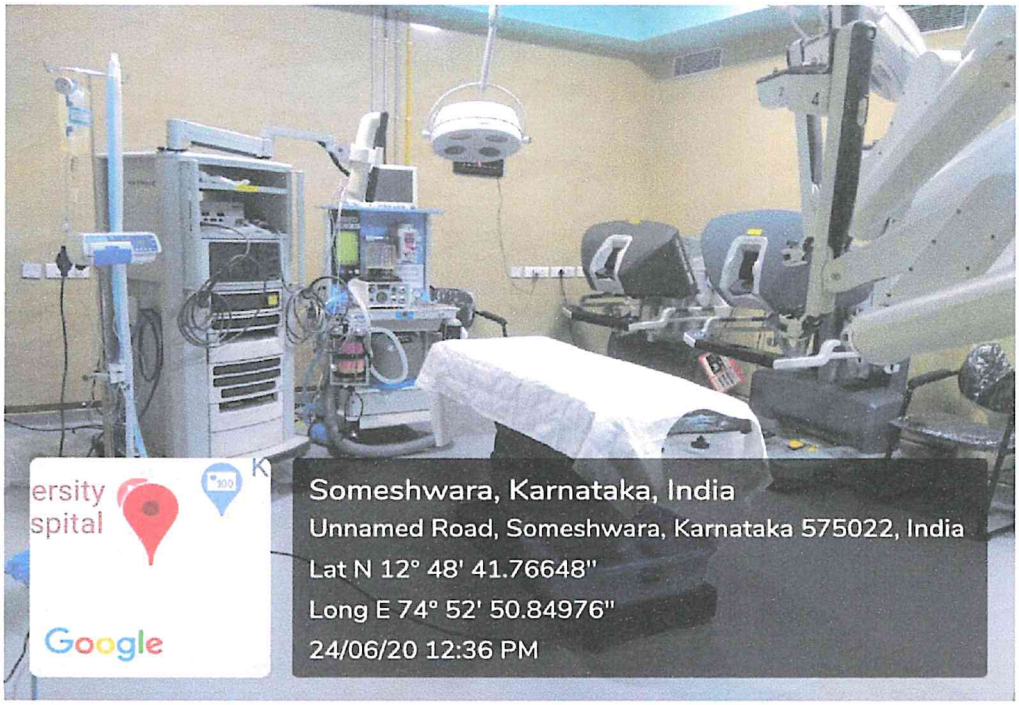
ADVANCED SURGICAL SKILL ENHANCEMENT DIVISION (ASSEND YU)

Pre anesthetic room

Robotic training unit



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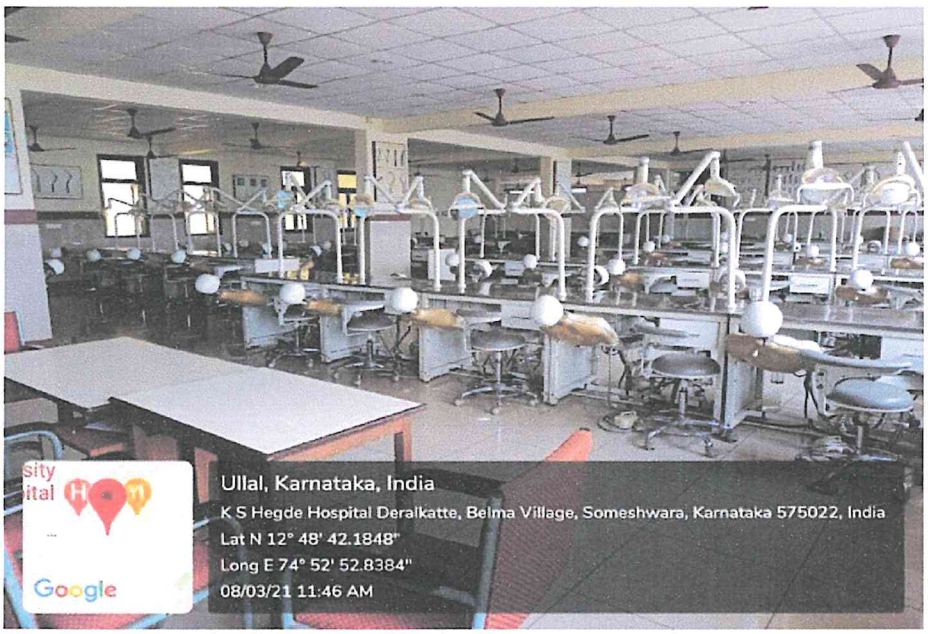
Geo-tagged photos of Yenepoya Dental and Nursing College

Preclinical Prosthodontics UG lab



Preclinical Conservative UG lab

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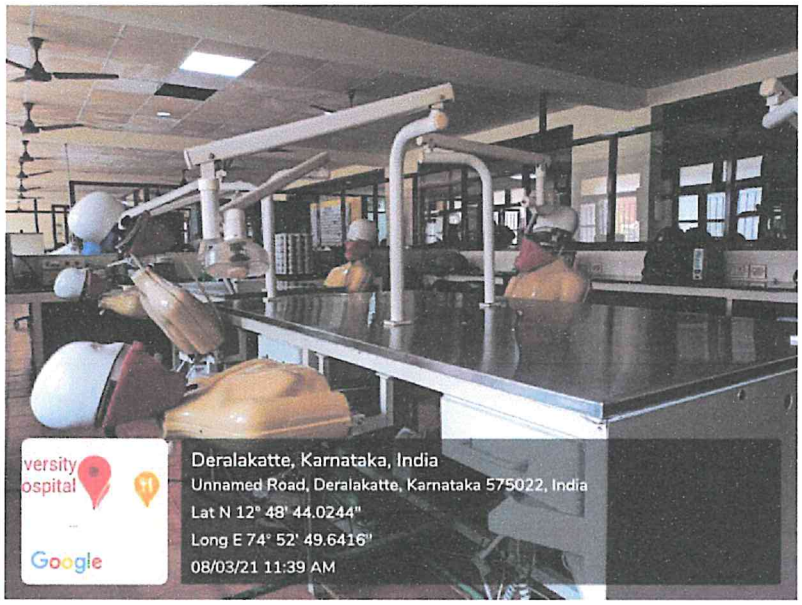
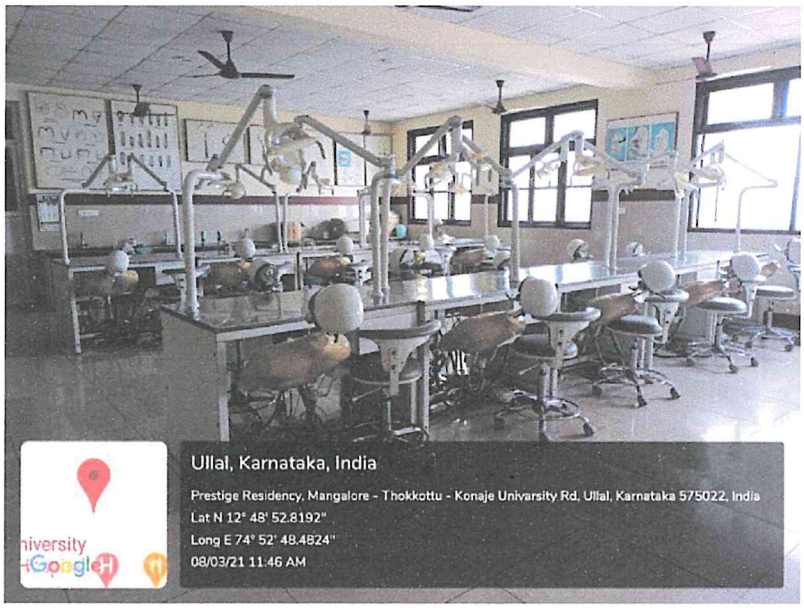
Mangalore 575 018, Karnataka.



Prosthodontics PG Lab



Conservative PG lab

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Implant training model

Articulator for pre-clinical teeth arrangement

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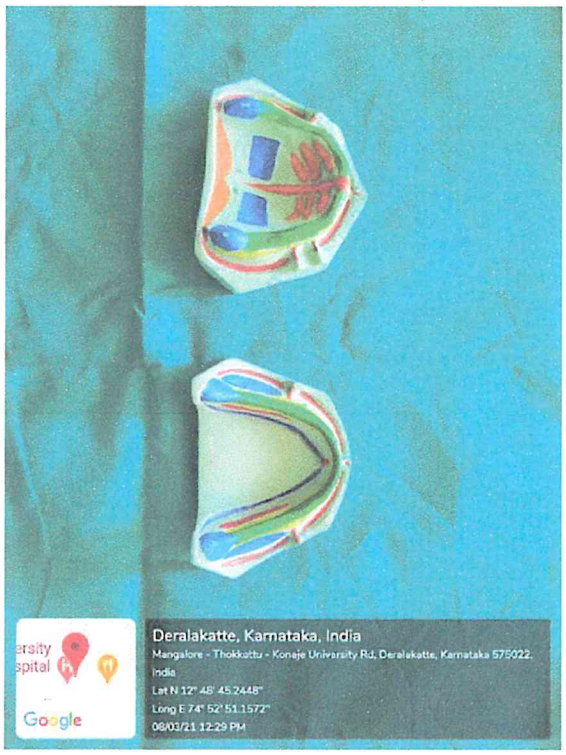
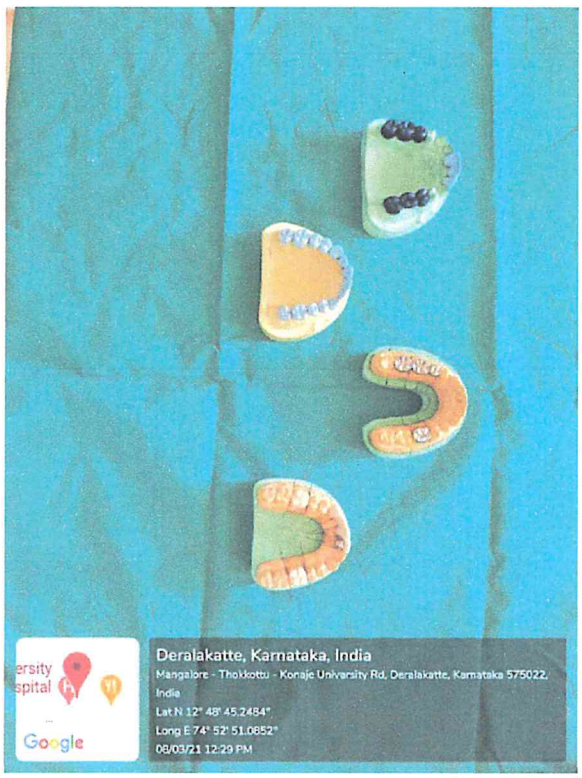


Stone model casts



Waxed up and casted tooth model

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Basic combination nursing manikin (Male)

Multifunctional nursing manikin (female)

Adult female manikin

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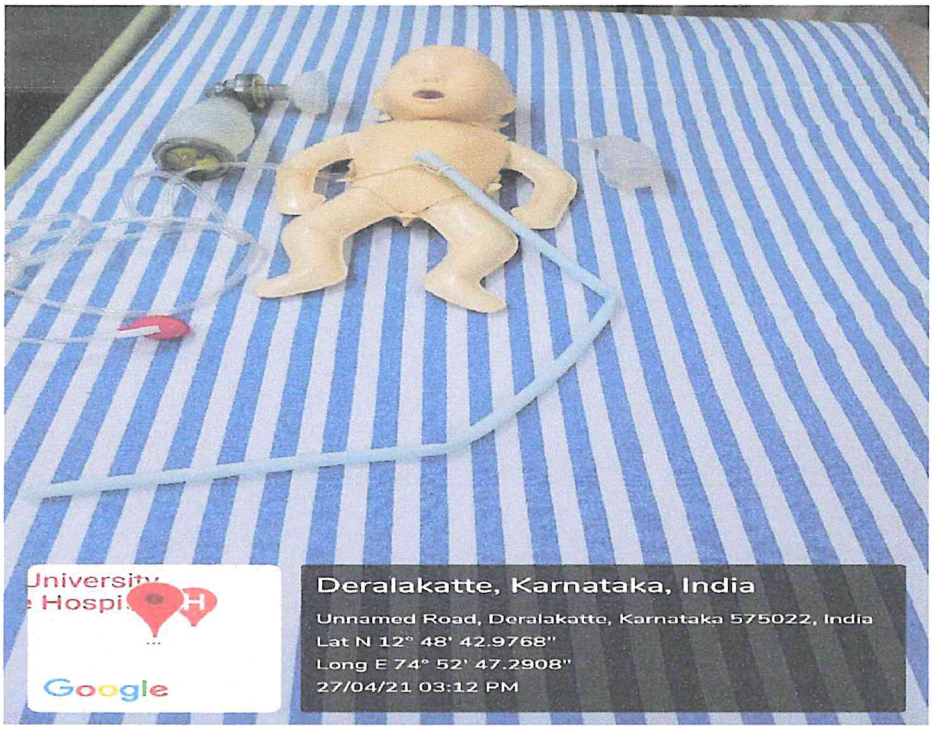
Infant manikin in Child health Nursing Lab



Newborn-helping the baby breath manikin in Child health Nursing Lab

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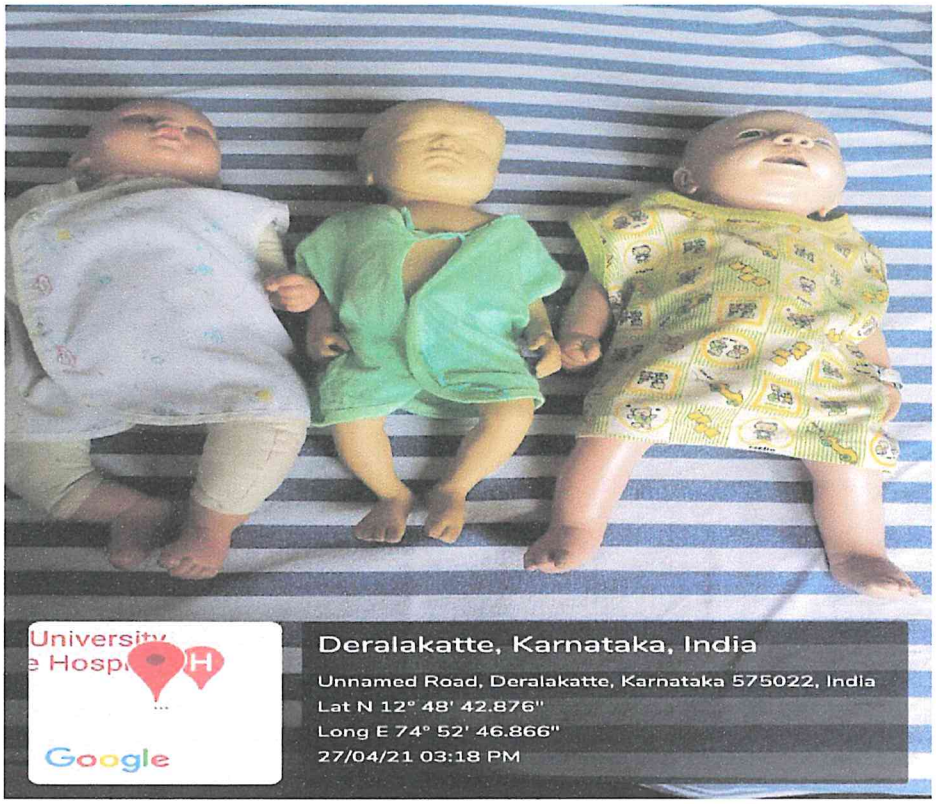
Antenatal assessment Manikin



Newborn Manikins

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Mangalore 575 018, Karnataka.

Faculty training, memberships and certifications

HILS Hull Institute of Learning and Simulation

NHS Hull University Teaching Hospitals NHS Trust

This is to certify that

Jeevan Pereira

Has completed the overseas fellowship programme with the Hull Institute of Learning and Simulation

on

Monday 16th September – Friday 4th October 2019

Dr Makani Purva
Deputy CMO and Simulation Lead

Dr David Wright
Deputy Director of Simulation

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Dr. Gangadhara Somayaji K S
Registrar
Yenepoya (Deemed to be University)
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HILS
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NHS
Hull University Teaching Hospitals
NHS Trust

This is to certify that

Meghna Mukund

Has completed the overseas fellowship programme with the Hull Institute of Learning and Simulation

on

Monday 16th September – Friday 4th October 2019

Dr Makani Purva
Deputy CMO and Simulation Lead

Dr David Wright
Deputy Director of Simulation

ATTESTED
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Registrar
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Mangalore 575 018, Karnataka.

THE GEORGE WASHINGTON UNIVERSITY
WASHINGTON, DC

COURSE CERTIFICATE

06/28/2020

Dr Rashmi Jain

has successfully completed

Essentials in Clinical Simulations Across the Health Professions

an online non-credit course authorized by The George Washington University and offered through Coursera

Pamela R. Jeffries, Sabrina Beroz, Pamela Slaven-Lee, Crystel Farina, Karen Lewis, Kristina Dreifuerst, Suzan Kardong-Edgre

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Coursera has confirmed the identity of this individual and their participation in the course.

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[National Teacher Training Centre (NTTC)]

Jawaharlal Institute of Postgraduate Medical Education and Research (JIPMER)

(An Institution of National Importance under Ministry of Health & Family Welfare, Government of India)

Puducherry-605 006.

National Medical Education Webinar Series

Certificate

This is to certify that Dr Rashmi Jain, Additional Professor, Yenepoya Medical College, Mangalore, Karnataka has participated in the 9th National Webinar on "*Simulation Based Medical Education for Patient Safety*" delivered by Dr. Dinker Pai, Professor of Surgery and Director of the Simulation Centre at Mahatma Gandhi Medical College and Research Institute, Puducherry on 3rd September 2020 from 11 am to 12 noon.

HoD of Medical Education
JIPMER

ATTESTED

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University Road, Deralakatte
Mangalore 575 018, Karnataka

The Dean (Academic)
JIPMER

Society for Healthcare Simulation

SIMULCON India

2nd NATIONAL SIMULATION CONFERENCE

EMPOWERING HEALTHCARE SIMULATION

This is to certify that **Dr. Rashmi Jain** has participated as a delegate in SIMULCON INDIA, 2nd NATIONAL HEALTHCARE SIMULATION CONFERENCE in its VIRTUAL EDITION held from 3rd to 5th December, 2020.

AP Medical Council has awarded 6 credit hours vide letter

APMC / ONLINE CME / 015 / 2020 dated 19th November 2020

Dr. Ganni Bhaskara Rao
President, SHS

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Dr. Gangadhara Somayaji K S
Registrar
Yenepoya (Deemed to be University)
University Road, Deralakatte
Mangalore 575 018, [illegible]

Dr. Ganni Sandeep
Organizing Chairman

Dr. B. S. Siva Reddy
Chairman, APMC

Dr.B. K. Naik
Registrar, APMC

Dr. Ch. Srinivasa Raju
Observer, APMC

List of faculty trained during user training workshops-14th to 18th March 2016

Sl. No.	Name	Designation	Department	Contact Number	E- Mail ID
1.	Dr. Venkatesh G Kamath	Assistant professor	Anatomy	9164190758	drvenkateshkamath@gmail.com
2.	Dr. Bindhu S	Associate professor	Anatomy	9945666156	nairbindhu@yahoo.com
3.	Dr. Qudusia S	Assistant professor	Anatomy	7899114567	qudsia.shariff@yahoo.co.in
4.	Dr. Mithun H K	Assistant Professor	Paedaitrics	9449049008	mithuntth@yahoo.co.in
5.	Dr. Supriya Kushwah	Assistant Professor	Paedaitrics	9916581086	drsupriyabhu@gmail.com
6.	Dr. Fareedul Hasan	Assistant Professor	Paedaitrics	9901722454	faree7@yahoo.com
7.	Dr. Niyaz Muhammed	Senior Resident	Paedaitrics	09826168781	niyazmails@gmail.com
8.	Dr.Mohemmed Reshad	Senior Resident	Paedaitrics	9986808271	mohdreshad@gmail.com
9.	Dr. Rashmi Jain	Associate Professor	Ophthalmology	9945921750	drrashjain@gmail.com
10.	Dr. M Bhima Bhat	Professor	Physiology	9448110115	drbhimabhat@gmail.com
11.	Dr. Prabhakar Adake	Assistant Professor	Pharmacology	9742351575	dradake82@gmail.com
12.	Dr Subodha H R	Senior Resident	ENT	9769866577	subhodh.hr@gmail.com
13.	Dr.Abhijith Shetty	Assistant Professor	General Surgery	9964244284	drabhishetty@yahoo.in
14.	Dr.Ryan Fernandes	Assistant Professor	General Surgery	9886644082	ryanfernandes@hotmail.co.in
15.	Dr. Deepu Chengappa	Assistant Professor	Respiratory Medicine	9480028391	deepuchengappa@gmail.com
16.	Dr. Vasantha O.T.,	Professor	Anaesthesiology	9731325061/62	vasanthaot@gmail.com
17.	Dr. Habib Rahaman A.A.,	Professor	Anaesthesiology	9448691922	habeeb100@gmail.com
18.	Dr. Meghna Mukund	Associate Professor	Anaesthesiology	9880432714	meghnamukund@gmail.com
19.	Dr. Shashwath Hegde,	Assistant Professor	Anaesthesiology	9916109116	shashwathhegde@yahoo.com
20.	Dr. Ananth Prasad Rao	Assistant Professor	Anaesthesiology	7411884636	drinfinityrao@gmail.com

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List of faculty trained during user training workshops-14th to 18th March 2016

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22.	Dr. Thippeswamy H.G	Assistant Professor	Anaesthesiology	8147775123	thippeswamy.hg@gmail.com
23.	Dr. Saifil,	Assistant Professor	Anaesthesiology	9747962871	fsaifil@yahoo.com
24.	Dr. Sathiqali	Assistant Professor	General Medicine	9916926356	sathiq_ali@hotmail.com
25.	Dr. Najeeb Behzad	Assistant Professor	General Medicine	9880585208	najeebbehzad@hotmail.com
26.	Dr. Prakruthi J	Assistant Professor	General Medicine	9819373458	prakruthi30@gmail.com
27.	Dr. Shruthi S Bhat	Assistant Professor	General Medicine	8123310176	shuthibhat@gmail.com
28.	Mrs. Hezil Reema Barboza	Lecturer	Yenepoya Nursing College	9008218663	hezilreemabarboza@gmail.com
29.	Dr. Asha P Shetty	Principal	Yenepoya Nursing College	9448770302	Asha02shetty@gmail.com
30.	Mrs. Renita Priya D Souza	Assistant Professor	Yenepoya Nursing College	9739319050	renipriya.dsouza@gmail.com
31.	Dr. Zakiya Maryam,	II year PG	Anaesthesiology	9880704124	zakscarlet@yahoo.co.in
32.	Dr. Paayal,	II year PG	Anaesthesiology	9986034347	paayalc@gmail.com
33.	Dr. Pramod	I year PG	Anaesthesiology	9008528324	drpramod0605@gmail.com
34.	Dr. Partha	I year PG	Anaesthesiology	9686248720	dr.parthadeka@gmail.com

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YENEPOYA UNIVERSITY

Rashmi Jain <rashmijain@yenepoya.edu.in>

Fwd: Welcome to the Society for Healthcare Simulation

Info SHS India <info@shsindia.in>
Bcc: rashmijain@yenepoya.edu.in

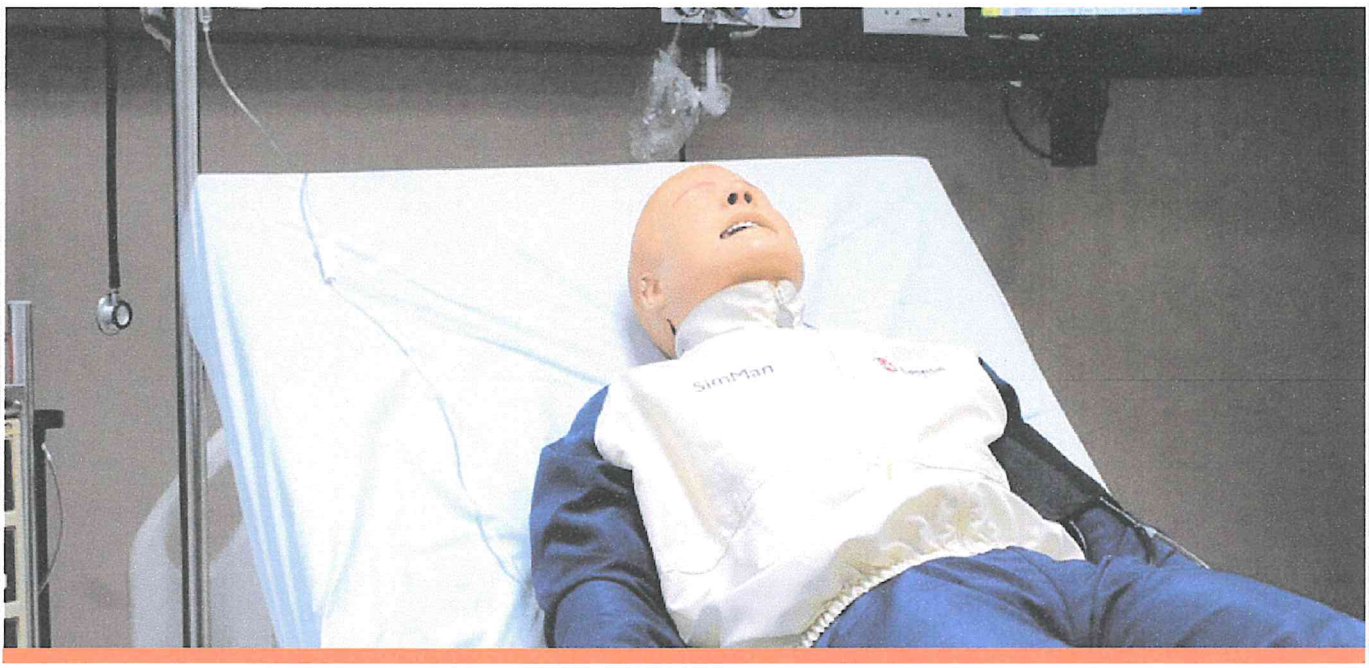
Sat, Jan 2, 2021 at 1:36 PM

Society for Healthcare Simulation

Thank you for choosing to be a Life Time Member with SHS

What is SHS

The Society for Healthcare Simulation (SHS) is a non-profit organization formed in the year 2019 to create a common platform of simulation resources in India for healthcare educators, providers, innovators, administrators and policy makers.



KEY OBJECTIVES OF SHS

ATTESTED

Simulation is fast becoming mainstream in India and the SHS is spearheading this movement.

SHS promotes standardisation of simulation technology, teaching methods and competency assessment that enhances quality of patient care, patient safety and thus improves patient outcome.

Dr. Gopeshara Somayaji K S
Registrar
Yenepoya (Deemed to be University)
University Road, Deralakatte
Mangalore 575 018, Karnataka.

We thank you for being one of many early adopters and we are excited to have you on board and partake in our journey into the future of medical education.

Please note that you will soon receive a Unique SHS ID.

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- Access to international webinars on various simulation topics
- International association with Global Simulation leaders like SSIH, ASPIH and more
- Front row access for SHS accreditation for your institute
- Benefits at our annual conference
- Access to Internationally accredited Simulation journals
- Active Organizational and stakeholder role in future SHS Events
- Administrative access to a unique adaptive online learning management solution

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Association of Physiologists and Pharmacologists of India (APPI)

Medical Education

An integrated simulation-based early clinical exposure module in cardiovascular physiology

R. Aswini Dutt[1], Rashmi Jain[2], Shobith Bangera[1]

Department of [1]Physiology and [2]Ophthalmology, Yenepoya Medical College, Yenepoya (Deemed to be University), Deralakatte, Mangalore, Karnataka, India.

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Published : 31 July 2020

DOI
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Quick Response Code:

ABSTRACT

Objectives: A good conceptual understanding of physiology is very important to build a strong foundation for medical students. It is a daunting job for teachers to emphasise the clinical relevance of basic science subjects as exposure to patients invariably starts after these subjects have been taught. With the introduction of early clinical exposure in the newly revised Indian undergraduate medical curriculum, this problem can be addressed to a certain extent. We developed an integrated simulation module for teaching cardiovascular physiology to pre-clinical students as a part of early clinical exposure.

Materials and Methods: We included 145 medical students of a Private Medical College of a Deemed to be University in Mangalore, Karnataka, India. The teaching module covered the topics of cardiovascular physiology such as functional anatomy, cardiac cycle, normal electrocardiogram (ECG), arrhythmia, arterial pulse examination, heart sounds and hands-on cardiovascular examination using a variety of simulators. The assessment was done by pre-test and post-test. A retro-pre questionnaire was used to assess their self-perceived knowledge gain and level of clinical skills. Feedback on overall experience was collected from the participants.

Results: The student feedback showed that learning experience was life-like (98.6%), effective, innovative and enjoyable (99.3%) and making the overall experience of learning easier (95.2%). It also improved participation, communication (93.8%), clinical skills and a better understanding of patient care (99.3%). The results of the retro-pre questionnaire to assess their self-perceived knowledge gain (95%) and level of clinical skills (96%) were highly satisfactory. The assessment of knowledge domain showed 100% of the students achieved pass percentage (>50%) with significant difference among pre- and post-test scores. Faculty (100%) opined that simulation-based teaching resulted in effected learning.

Conclusions: The use of simulation-based teaching in cardiovascular physiology as part of early clinical exposure leads to enhanced learning and clinical application. This will stimulate interest in subject and promote better learning.

Keywords: Cardiovascular, Manikins, Medical education, Simulation training

INTRODUCTION

Physiology is a foundation for health professional students which require a lucid understanding of the concept. It is a core and mandatory subject for students of medical, dental, nursing and allied health sciences, which is considered as a difficult yet interesting at multiple levels by the students.[1] At present, physiology is being taught to undergraduate pre-clinical medical students in India using didactic lectures, small group tutorials, web-based e-learning and project-based methods.[2] The purpose of these different teaching-learning methods is to make the students

understand the clinical application of physiology in interactive and innovative style.

Till 2018, early clinical exposure was not a norm in most Indian medical colleges, which has now become an integral component of a new competency-based medical education curriculum. Lack of direct patient encounter and knowledge regarding actual health-care setting, it is a daunting task for educators to find a bridge to fill this lacuna.[3] The traditional model of teaching is being supplemented with different innovative techniques, to link the pre-clinical and clinical topics. This has not been effectively implemented everywhere due to multiple constraints at various levels.[2] There is a need to find ways to make undergraduate physiology learning experience more interesting, stimulating and enthusiastic with 'in action' student engagement using simulators. The use of mannequins, especially High Fidelity patient simulators promotes active and experiential learning.

Simulations are defined as 'approximations to the reality that require trainees to react to problems or conditions as they would under genuine circumstances.'[4] The simulation-based learning has been accepted as an established method for honing clinical competencies of medical, dental, nursing and other health sciences students worldwide.[5] Training in a stress-free and no-risk environment enhances students' emergency response. This results in a confident health professional.[6] 'Shows how' level of Miller's assessment framework requires the learner to demonstrate the integration of knowledge and skills into successful clinical performance. Simulation-based assessment tests a student at this level and has attained an important educational value by profoundly enhancing the learning environment for undergraduate students.[7]

Due to all these benefits, high fidelity human patient simulators have expanded their horizons into high school and college levels too. Here, it aids the students in problem-solving and critical thinking.[8] This mode of training is equipment demanding, needs sophisticated technology and trained simulation educators.

Simulation-based teaching has been effectively adapted in clinical specialties such as anaesthesia, emergency medicine, intensive care medicine, surgery, obstetrics, paediatrics, ophthalmology and radiology.[9] The simulators can be used to teach basic anatomy and physiology integrating with clinical aspects, in close to real-life settings. However, effectively using the same for teaching the basic science concepts to undergraduate pre-clinical students is not yet an established practice. The reasons could be due to lack of pre-existing framework and adequately trained simulation educators.

Gordon *et al.* and Harris *et al.* have shown that human patient simulators when used for undergraduate medical students to teach physiology, improves their learning process and helps in the retention of concepts.[10,11] The feedback obtained from the students who have undergone this process showed a deep satisfaction as shown in Harvard Summer Preclinical Institute by Gordon *et al.*[12]

In a study by Agha *et al.* to evaluate medical students' satisfaction with simulation-based learning strategy at College of Medicine, King Saud bin Abdulaziz University for Health Sciences, Riyadh, Saudi Arabia, showed significant difference between the satisfaction scores among genders as female students' preference for simulation-based teaching was more compared to their counterparts.[13]

There are limited studies regarding the implementation and learning outcomes of simulation-based physiology teaching as part of early clinical exposure using High Fidelity simulators in the Indian setup. The needs assessment of students showed that they preferred simulation-based learning. Hence, we aimed to develop an integrated simulation-based module with assessment blueprint for teaching cardiovascular physiology to undergraduate pre-clinical medical students as part of early clinical exposure. We also evaluated the training process to assess whether it is beneficial for understanding the concepts and acquiring clinical skills. We studied any gender-wise preference in simulation-based learning among the students.

MATERIALS AND METHODS

This module was developed and implemented for 1st-year undergraduate pre-clinical medical students (n = 145) of Yenepoya Medical College of one cohort for teaching cardiovascular physiology. The simulation training was conducted at Advanced Comprehensive Clinical Training and Simulation Centre (ACTS-YEN), Yenepoya (Deemed to be University), Mangalore, Karnataka, India. The Institutional Ethics committee approval was obtained for the study.

The needs assessment was done in consultation with the stakeholders including the student fraternity before module development. The students were explained about different teaching-learning strategies which included large group interactive teaching, small group teaching, E-learning, simulation-based and project-based learning. These teaching-learning methods were discussed with the students highlighting the advantages and limitations of each. This was then followed by written feedback. The feedback was collected to determine the order of their preference for learning cardiovascular system. The analysis showed that 95% of them opted for simulation-based learning as their topmost preference.

Development of simulation-based module

Brainstorming sessions were conducted with the teaching faculty from physiology, department of internal medicine and

medical education unit. The module hence created consisted of the goals and learning objectives for each simulation sessions which were defined with learning outcomes and assessment methods [Figure 1].

A plan was prepared for the briefing, scenarios, simulations, debriefing and evaluation. A team of simulation educators was selected and trained for the implementation of plan. A pilot session was conducted on a group of 2nd-year students and their feedback was collected. Based on these results, few changes were made to the plan.

Students were introduced to the topics of cardiac cycle and electrocardiogram (ECG) by large group interactive method. An electronic pre-test that comprised 15 multiple choice questions from the topics of cardiovascular physiology was administered to the students.

The actual process at the simulation centre

The students (n = 145) were giving a briefing about the learning outcomes, the working of simulators and facilities available at the simulation centre for 20 min. This included hands-on experience with mannequins, techniques, scenarios and procedural skills. The students were then divided into five groups of 30 each having a team leader and timekeeper for smooth transition between the sessions. Students were rotated in an orderly pre-planned fashion across the four simulation stations. Each station was of 20 min duration. [Figure 1] Each station had one simulation educator to facilitate learning. A brief description of each station is as follows.

Station 1

This was a Virtual Dissection Table by Anatomage Inc. (California, USA, 2016.) This table provides a visualisation of human anatomy with high-level accuracy and dissectible in 3D format. Using this, students were shown the structural anatomy and relations of heart and major blood vessels. Students were encouraged to individually identify the structural relations of the heart.

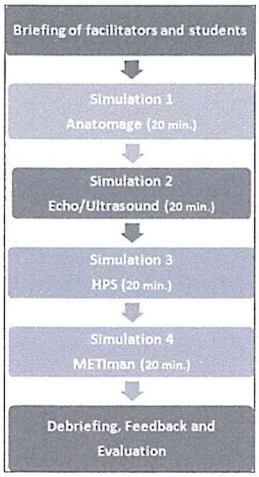

Figure 1: Steps involved in the implementation of the simulation module.

Station 2

This station had an ultrasound simulator-Vimedix (CAE Healthcare, Canada, 2016). The simulation educator explained the flow of blood through chambers of heart, cardiac cycle with pressure and volume changes. The production of the heart sounds was also explained.

Station 3

A clinical case scenario of ventricular fibrillation admitted in an intensive care unit was created on a High Fidelity Human Patient Simulator (HPS) (CAE Healthcare, Canada, 2014). The students were briefed regarding the working of HPS and the usage of various equipment, drugs and monitors connected to it. The learning objective of this station was to teach the electrical conduction system of the heart, its relation to ECG, normal ECG and identifying the abnormalities of rhythm in ECG.

Station 4

This station aimed at teaching clinical examination of the cardiovascular system using METIman (Medical Education Technologies Inc, CAE Healthcare, Canada, 2014), which is a High Fidelity patient simulator. With this simulator, arterial pulse examination including all peripheral pulses, heart sounds, apex beat, cardiac borders examination and breath sounds was demonstrated. The students were asked to practice individually on this mannequin.

The student doubts were addressed throughout the interactive sessions as well as at the end of the entire process.

Debriefing, feedback and evaluation

After the students completed the entire process, they were administered a questionnaire regarding their learning experience at the simulation centre [Table 1] and feedback was sought at each station [Figure 2]. An electronic post-test was conducted to evaluate the change in knowledge. A retro-pre questionnaire, based on the Dreyfus Model of skill acquisition was administered. They were asked to rate their self-perceived change in understanding of concepts in cardiovascular physiology. They also rated their confidence levels in clinical skills before and after the simulation training. The feedback from faculty involved in the planning and implementation of this integrated teaching module was also collected [Figure 3].

Table 1: Student perception of simulation-based learning (n=145).

Questions	Strongly agree (%)	Agree (%)	Undecided (%)	Disagree (%)	Strongly disagree (%)
The training session resembled a real-life situation	90 (62.1)	53 (36.6)	1 (0.7)	1 (0.7)	0
Cardiovascular physiology concepts were easily learnt by simulation	85 (58.6)	53 (36.6)	4 (2.8)	3 (2.1)	0
Initial briefing helped me to learn better	64 (44.1)	76 (52.4)	4 (2.8)	0	1 (0.7)
I feel that simulation is essential in understanding diseases of cardiovascular system	99 (68.3)	44 (30.3)	1 (0.7)	1 (0.7)	0
Small group teaching with simulation is a better way of teaching learning	105 (72.4)	34 (23.4)	4 (2.8)	1 (0.7)	1 (0.7)
Integrating anatomy with physiology facilitated my learning	93 (64.1)	50 (34.5)	2 (1.4)	0	0
Small group teaching with simulation keeps us to be more involved in learning	96 (66.2)	40 (27.6)	8 (5.5)	1 (0.7)	0
Simulation training can improve patient safety and quality of healthcare	95 (65.5)	49 (33.8)	0	1 (0.7)	0
Simulation can improve effective participation and communication	87 (60)	49 (33.8)	6 (4.1)	2 (1.4)	1 (0.7)
Simulation in healthcare has advantages for training and gaining the competencies for students	81 (55.9)	61 (42.1)	3 (2.1)	0	0
The training session was enjoyable	113 (77.9)	31 (21.4)	0	1 (0.7)	0
I would prefer to have more of simulation-based teaching in addition to traditional teaching methods in learning	124 (85.5)	21 (14.5)	0	0	0

(The top value is the number of students and in parentheses is the % of the total).

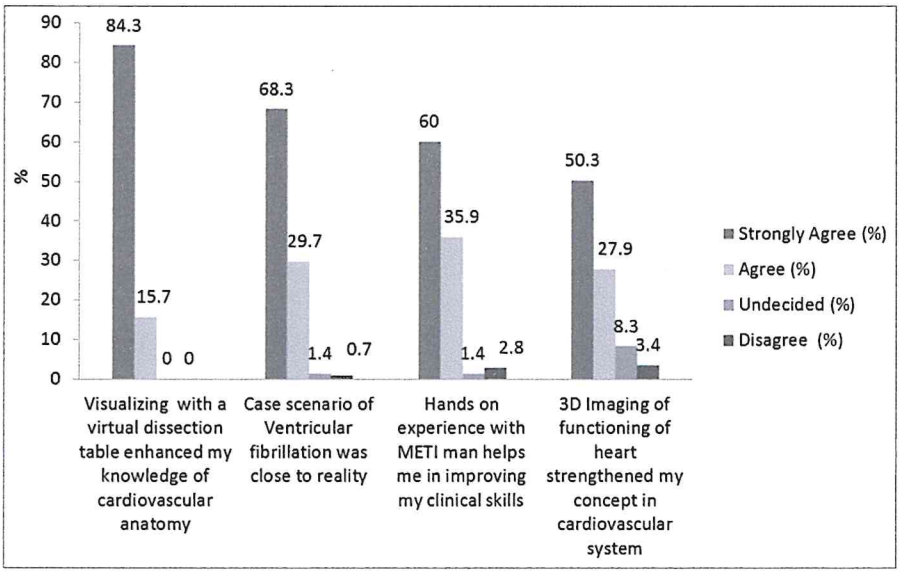

Figure 2: Student feedback on the utility of simulation stations.

The feedback from students and faculty along with assessment scores were analysed statistically using the Chi-square test, with $P < 0.05$ taken as statistically significant (Statistical software IBM SPSS Version 23). MS Excel was used for data entry and generation of graphs. Yengage, an online learning portal of Yenepoya (Deemed to be University), which is created on the ILIAS platform was used for assessment and feedback.

RESULTS

The student feedback on simulation-based learning shows that the cardiovascular physiology concepts and clinical skills were better understood in a near real-life situation (98.7%). Integrating anatomy, physiology with internal medicine in small groups was well appreciated. It made learning enjoyable for them (89.3%). The students' feedback was highly

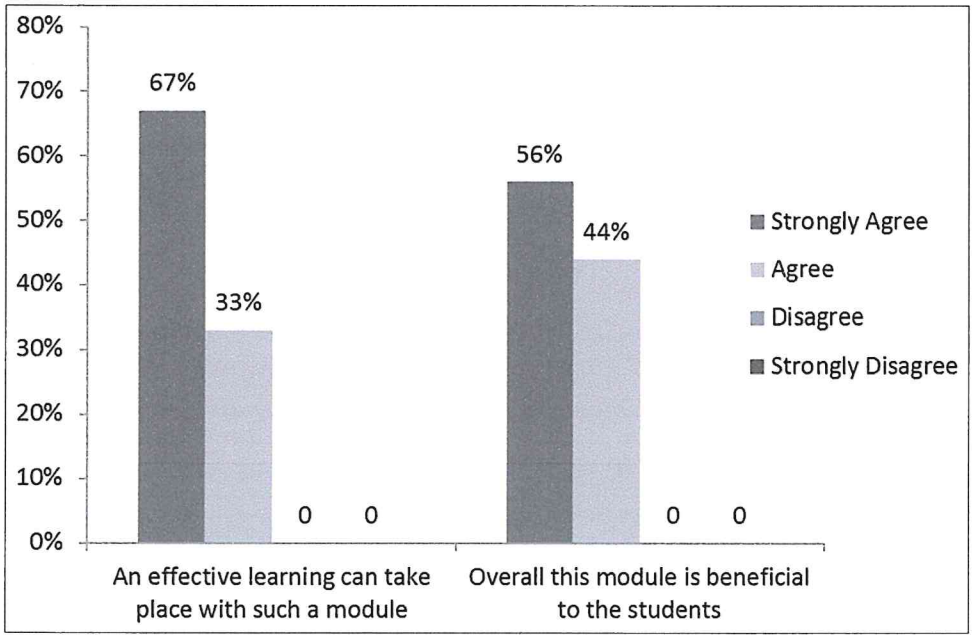

Figure 3: Faculty feedback on simulation-based teaching module (n=14).

Table 2: Gender-wise comparison of student feedback on simulation-based learning (n=145).

Questions	Strongly agree		Agree		Undecided		Disagree		Strongly disagree		*P*-value
M (n=65) F (n=80)	M	F	M	F	M	F	M	F	M	F	
Hands on experience with METIman helps me in improving my clinical skills	33 (51)	54 (67)	26 (40)	26 (33)	2 (3)		4 (6)	-	-	-	0.02
3D Imaging of functioning of heart strengthened my concept in cardiovascular system	26 (40)	47 (59)	30 (46)	25 (31)	8 (12)	4 (5)	1 (1)	4 (5)	-	-	0.04

(The top value is the number of students and in parentheses is the % of the total for the significant items only)

satisfactory for all the simulation stations. The majority of the students agreed that simulation sessions at every station addressed their need to integrate basic cardiovascular concepts with clinical applications effectively [Figure 2].

They also felt that it helped them in improving their communication skills (93.8%) and would prefer to have more simulation based teaching [Table 1].

On analysing for gender difference in learning preference, it was noted that the female students preferred hands-on experience with METIman in improving clinical skills and 3D imaging of functioning of heart when compared with the male students which were statistically significant [Table 2].

The faculty feedback revealed that 67% of the faculty strongly agreed and 37% agreed that effective learning takes place with a simulation-based integrated module. Similarly, 56% of the faculty strongly agreed and 44% agreed that this module is beneficial for student learning [Figure 3].

Table 3: Evaluation of simulated student learning.

Retro-pre questionnaire	Results	
Physiology concepts in cardiovascular system	95% advanced from beginner to proficient	
Confidence levels in clinical skills	96% advanced from beginner to proficient	
Electronic test results		
Number of students who took the tests (n)	145	*P*<0.0001
Average pre-test score	10.41/15	
Average post-test score	13.36/15	
Number of students who scored above 75% in post-test	91 (63%)	
Number of students who scored 65–75% in post-test	54 (37%)	

[Table 3] shows responses of the students to the retro-pre questionnaire to assess their self-perceived knowledge gain

and level of clinical skills before and after the integrated teaching session. Most of the students advanced from beginner to proficient in acquiring these skills (95% and 96%, respectively). Their summative assessment scores to test their actual gain in knowledge showed that all the students achieved the minimum pass percentage as desired.

DISCUSSION

The process of development and evaluation of an integrated simulation-based learning module as part of early clinical exposure to teach cardiovascular system physiology concepts to 1st-year undergraduate pre-clinical medical students was studied. Meticulous blueprinting the topics, using multiple modalities and integrating physiology knowledge with clinical application has helped in improving the students' academic and clinical performance. Proper understanding of physiology concepts in undergraduate teaching is the foundation basis for most disciplines/subjects in medical field. Learning clinical skills are one of the competencies expected to be attained by 1st-year undergraduate as per Medical Council of India's new competency-based medical education curriculum.[14] Hence, this module has helped students in improving both knowledge and clinical skills.

The stress-free environment has contributed to an enjoyable learning experience. Before the introduction of the new curriculum in the absence of early clinical exposure, real-life simulation sessions in undergraduate physiology helped the students to link theory to clinical aspects of cardiovascular system. The small group training sessions have the advantage of more interaction among the students which enhance their communication levels among themselves and the teachers. An integrated approach to teaching using simulations was beneficial to the students which gave them a comprehensive picture of learning medicine instead of compartmentalising anatomy and physiology as individual units.[11]

The virtual dissection table has the advantage of performing layer by layer dissection and visualising structures in various views in three dimensions. This has helped the students in integrating structural anatomy with functional physiology in our study. Similar results were found in a study conducted on 1st-year medical students in Canada who perceived enhanced learning with virtual dissection. This proved that virtual dissection augmented cadaveric dissection in medical education.[15]

The students could visualise the chambers of heart, valves, blood flow inside the heart, contraction of cardiac muscle and valvular movements using 3D imaging. Bell FE 3rd *et al.* have studied the effect of using ultrasound simulation to teach cardiac physiology to 1st-year medical students at the University Of South Carolina School Of Medicine. The post-test scores showed improvement in knowledge and the feedback from them was very positive as a valuable teaching tool for learning.[16] According to educational psychologists, the instructional methods that emphasise guidance with practical approaches are more effective than minimally guided approaches.[17] The use of trained simulation educators to facilitate learning at station could also be a factor contributing to improved student satisfaction.

The students were able to appreciate the intensive care unit set up which was created to monitor and manage a case of ventricular fibrillation in the simulation sessions using HPS in our study. They understood the diagnosis of the disease using symptoms and electrocardiogram. The students in small groups were able to feel the emergency situation, the behaviour of the staff handling the simulated patient and how he was treated. The web-based and mannequin simulations for learning shock physiology were conducted for 40 students at University of Central Florida, Orlando and Florida, where students rated the mannequin simulation as more effective in teaching shock and its treatment aspects which are in accordance with our observed results.[18] To teach undergraduate pre-clinical medical students in physiology, High Fidelity simulators have been used in the previous studies to teach basic neuroscience concepts,[19] respiratory physiology,[20] hypovolemic shock[21] and renal failure[22] only at selected centres worldwide. By appropriate design of the scenarios, proper training with simulators, drafting specific learning objectives with an assessment component, the desired goal can be attained effectively.[23]

METIman has an advantage of examination of precordium, arterial pulses, peripheral pulses, respiratory sounds and heart sound on a simulator without any discomfort to the subject or a patient. Females preferred hands-on experience with METIman in improving clinical skills while examining cardiovascular system. This might be due to overcoming the inhibition of practicing examination on male colleagues, which is observed in the Indian setup. This gender-wise difference of student feedback on simulation-based learning with different simulators is similar to the studies done in Saudi Arabia.[13]

The previous studies using HPS and METIman at different places have revealed that student satisfaction and learning are maximum with simulation-based teaching.[24] It has resulted in better understanding of the physiological aspects which are directly linked with the pathological conditions which are mimicked using Low and High Fidelity simulators.[25] In addition to the traditional didactic lectures, small group teaching, an integrated simulation-based teaching which includes hands-on experience for real-life-like situations increases the retention of learned knowledge as it involves the concept of 'learning by doing.' It has been proposed that in all health specialties, patient simulation with virtual reality blended with e-learning will enable medical students to learn effectively in a greater way.[26]

We found most of the students felt that their self-perceived knowledge and level of clinical skills have increased along with 100% of the students achieving a minimum pass percentage in their assessment. Similar results were seen in a study conducted in Chennai, India with simulation-based teaching. Their results showed that this mode of teaching had a significant impact on the knowledge and skills of both the gender group.[27]

The students in our study enjoyed the whole process of simulation-based learning as it is different from the traditional model of curricular transactions. All the students would like to have more simulation-based teaching programs for other topics in physiology. This innovative method of student teaching-learning strategy is being implemented across the health-care institutions worldwide.[28] In spite of such innovations in teaching-learning strategies, most of the medical colleges in India are following traditional teaching-learning methods.[29] The High Fidelity simulators with a functional physiological model are yet to be effectively utilised and incorporated into our curriculum. The reason for not using simulators may be related to the high operational cost involved. Simulation-based teaching integrated with other traditional methods in basic science education can definitely improve student learning.[30] Simulation-based learning implemented in curriculum helps the students to effectively practice patient care away from the bedside, enhance their theoretical and clinical skill knowledge.[31]

We are in the process of developing simulation-based integrated modules in other topics to cater to the needs of the student community. Such module needs to be incorporated into health medical curriculum to produce competent health-care professionals.

CONCLUSION

An integrated approach to early clinical exposure using simulation is useful for understanding the complex physiological mechanisms of the cardiovascular system. With sufficient infrastructure and clear planning, the learning process of the students can be made more effective and interesting.

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Declaration of patient consent

Patient's consent not required as patients identity is not disclosed or compromised.

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Nil.

Conflicts of interest

There are no conflicts of interest.

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Original Research Article

Outcome of triage results between two groups of interns subjected to different model of simulation

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ABSTRACT

Background: In the emergency department, triaging is a very important for mass casualties and should not lead to any errors while doing so. In spite of subjecting interns to triaging theory classes in their final year of MBBS, they are not confident in triaging when need comes. To address this, we designed this study which aims at understanding the efficacy and type of triage based simulation education for medical interns during their 1 year internship programme.
Methods: A cross sectional study with 186 intern students of a Yenepoya Medical College Hospital of Karnataka was selected for the triage simulation. The interns who could attend the entire programme were randomly divided into 2 groups of n=91 each. One group underwent desktop based triage simulation (n1=91) and the other group faced enacted patient based triage simulation training followed by test. Evaluation comprised of tests to 2 groups of interns. The first group were subjected to test following desktop triage simulation and the second group were subjected to test following enacted patient simulation based triaging.
Results: The test result showed that there was significant improvement in the result obtained from the group that underwent high fidelity simulation ($p<0.05$).
Conclusions: Simulation based training which is closed to reality leads to a significant increase in learning and recalling output compared to the traditional method.

Keywords: Triage, Simulation, Emergency, Interns

INTRODUCTION

'Good judgement comes from experience and experience comes from bad judgement', one among the pinnacle concepts in the journey of a medical student. The aviation industry was one of the first to implement simulation as an educational tool to reduce the mishaps due to human error. This experience provided insights to how simulation based education are successfully incorporated into medicine. Simulation-based educational methods are recognized as an established component of medical training for medical students, residents, and fellows.[1] for applying theoretical knowledge in a better way reducing the human errors. Triage is defined as the initial clinical sorting process in hospital Emergency department. Especially in high risk scenarios such as triaging. The patient has to be sorted out to the right code without any delay for the appropriate treatment to begin.

Hence proper coding in the shortest available time is of prime importance. A watershed study in the simulation fidelity realm specifically identified studies that compared performance outcomes associated with low- and high-fidelity simulators vs. No intervention controls.[2]

Alessi's foundational paper addressed not whether high fidelity is a critical, but whether for particular levels or categories of learners or instructional goals, different levels of fidelity might be more or less appropriate and beneficial.[3]

Many studies showed no significant advantage of high fidelity simulation over low fidelity simulation, with average difference ranging from 1% to 2%.[2] Practically it is difficult and dangerous to subject the interns to triaging in real scenarios. Although simulation is identified for its contribution to learning, critics claim this doesn't portray the complexities of the actual pre hospital environment and question how effective assessment is when undertaken in a controlled setting. Hence the objectives of this study were to subject medical interns of tertiary care hospital to two models of (low fidelity– desktop and high fidelity enacting subjects) simulation on triaging to compare the outcome. Also, to understand the efficacy of such teaching methodologies to integrate it with the curriculum, and to modify it periodically for achieving the best possible outcome.

METHODS

A cross sectional study using complete enumeration sampling method, the interns of Yenepoya Medical College Hospital, Mangalore, Karnataka, India (n=186) were selected who were randomly allocated into two groups of desktop based triage simulation (Group 1, n=91) and enacted patient based triage simulation training (Group 2, n=91) during October 2018 to January 2019. Interns who could participate in both pre and post-test of triage simulation were included in the study. Four interns were excluded as they could not participate in both the simulation and the test. To avoid inconvenience to the operation of the emergency department and interns postings, this intervention was done over the span of 2 weeks. The Institutional Ethics committee approval was obtained for the study. There were no health risks, discomforts, or inconveniences reported due to participation. Both groups underwent a simulation pretest to compare the differences between the two groups. The first group simulation was conducted at Advanced Comprehensive Clinical Training and Simulation Centre (ACTS-YEN), Yenepoya Deemed to be University, Mangalore, Karnataka.

The second group simulation was conducted in the emergency department of hospital. Moulage was applied to each patient actor to create lifelike injuries. They were wheeled/brought on stretchers into the emergency department from the ambulances (Figure 1 and 2). They had their vitals and injury details mentioned on a placard which was tagged in the front of their clothes. The interns who were able to attend the both scenario and the test were included in the study. Paediatric triaging was excluded. Each participant read and noted his/her response according to instructions in the self-administered questionnaire. The collected data was compiled and kept under safe custody of the principal investigator in our simulation centre and confidentially was maintained.

Figure 1: Multiple lacerated wounds with tachycardia on left and unresponsive person on the stretcher on the right.

Figure 2: (a) Pregnant lady being wheeled into casualty, (b) unconscious girl with vitals in normal limits.

Both the groups were subjected randomly coded specific question paper set before and after simulation. Same set of questions were repeated to the candidates in the pre- and post-test amongst both the groups. There were a total of six question papers each having 5 set of questions about triage, with two separate columns for answering. First column to specify the triage code and the second column to justify the code based on vitals/conscious status.

Simple triage and rapid treatment (START) is currently the most widely used triage system in the United States for mass casualty incidents.[4-7] It was developed in 1983 by staff at Hoag Hospital and Newport Beach Fire and Marine Department in California for rescuers with basic first-aid skills.[8] First, responders delegate the movement of injured victims to a designated collection point as directed by using four main categories based on injury severity:

Black: (Deceased/expectant) injuries incompatible with life or without spontaneous respiration; should not be moved forward to the collection point.

Red: (Immediate) severe injuries but high potential for survival with treatment; taken to collection point first.

Yellow: (Delayed) serious injuries but not immediately life-threatening.

Green: (Walking wounded) minor injuries.

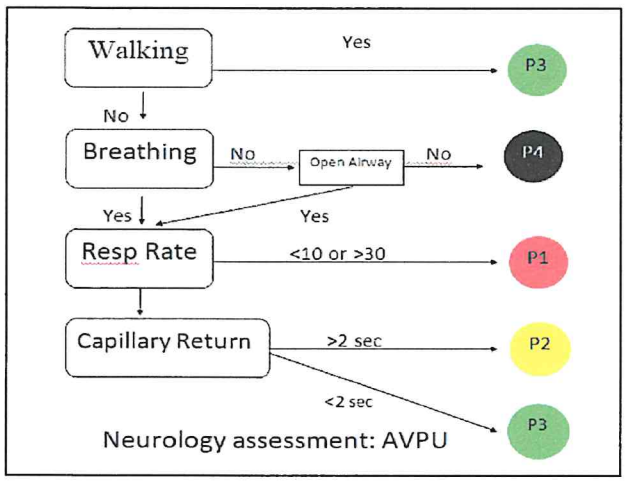

Figure 3: Table for sorting out the patients into different designed areas.

The triage colours were assigned by giving triage tags to patients or simply by physically sorting patients into different designated areas (Figure 3). "Green" patients were assigned by asking all victims who can walk to a designated area. All non-ambulatory patients were then assessed. Black tags were assigned to victims who are not breathing even after attempts are made to open airway. Red tags were assigned to any victim with respiratory rate greater than 30, absent radial pulse or cap refill greater than 2 sec and unable to follow simple commands. Yellow tags were then assigned to all others.

Neurological assessment was done using the mnemonic AVPU (Alert, responds to verbal stimuli, responds to painful stimuli, and unresponsive).

The interns were given a list of victims of different types of injury, assuming that all walking wounded have moved away from the area and that the findings are after they have repositioned the airway of any non-breathing patients. They were asked to categorise them with appropriate reason based on vital parameters and AVPU (Table 1).[8]

Table 1: Questionnaire items selected for all 6 sets for simulation.

Victim	Type of injury	Pertinent information
#1	Compound fracture, left femur	Respiratory rate over 30/minute; radial pulse absent; awake
#2	Sudden onset of chest pain with shortness of breath	Respiratory rate under 30/minute; capillary refill under 2 seconds; awake
#3	90% second degree burns	Respiratory rate none on arrival, spontaneous after repositioning; radial pulse present; unconscious
#4	Facial Injury	Respiratory rate over 30/minute; capillary refill under 2 seconds; awake
#5	Unable to move legs	Respiratory rate <30/min; radial pulse present; awake
#6	No apparent injuries	Respiratory rate normal; capillary refill <2 seconds; awake
#7	Sucking chest wound	Respiratory rate >30/min; radial pulse present; unconscious
#8	Dislocated right shoulder	Respiratory rate <30/min; radial pulse present; awake
#9	No visible wounds	Respiratory rate none; radial pulse absent; unconscious
#10	Scalp wound, estimated blood loss 500 cc	Respiratory rate >30/min; capillary refill <2 seconds; awake
#11	Massive head injury	Respiratory rate <30/min; radial pulse absent; unconscious
#12	Bruising over abdomen, complaining of abdominal pain	Respiratory rate >30/min; capillary refill <2 seconds; awake
#13	Impaled, 1 foot piece of shrapnel in right eye	Respiratory rate <30/min; radial pulse present; awake
#14	Female six months pregnant; broken left, lower leg	Respiratory rate <30/min; capillary refill <2 seconds; awake
#15	Severe difficulty breathing, chest sinks in on inspiration	Respiratory rate >30/min; radial pulse present; awake
#16	Unable to move, no verbal response	Respiratory rate <30/min; radial pulse present; awake and staring
#17	Amputated left arm, bleeding controlled	Respiratory rate <30/min; capillary refill <2 seconds; awake
#18	Large head wound, brain matter showing	Respiratory rate absent; radial absent; unconscious
#19	Minor abrasions	Respiratory rate <30/min; capillary refill <2 seconds; awake
#20	Bruise on forehead, blood in ears and nose	Respiratory rate <30/min; radial pulse present; unconscious
#21	Third degree burns over front of both legs	Respiratory rate <30/min; capillary refill <2 seconds; awake
#22	Compound fracture, left arm	Respiratory rate <30/min; radial pulse present; awake
#23	Impaled stick in right chest	Respiratory rate <30/min; capillary refill <2 seconds; awake

Continued.

Victim	Type of injury	Pertinent information
#24	Second degree burns, legs	Respiratory rate >30/min; radial pulse present; awake
#25	Blood in right eye	Respiratory rate <30/min; capillary refill <2 seconds; awake
#26	Eighteen year old adolescent, no visible injury	Respiratory rate absent; radial pulse absent; unconscious
#27	Impaled object, RUQ abdomen; difficulty breathing	Respiratory rate >30/min; radial pulse present; awake
#28	Patient saying same words over and over, "what happened?	Respiratory rate <30/min; capillary refill <2 seconds; awake
#29	Spurting blood from neck injury	Respiratory rate >30/min; radial pulse present; awake
#30	Patient states she is a diabetic; skin, moist and clammy; feels shaky	Respiratory rate <30/min; capillary refill >2 seconds; awake

The study was assessed based on the comparison of post test results between both the groups. The data of tests were collected and tabulated in excel sheet. Statistical analysis was done using independent t-test with IBM SPSS software ver.23. Data were represented as Mean±Standard deviation. P<0.05 was considered statistically significant. The final results were graphically represented and conclusions were drawn.

RESULTS

About 186 interns were selected for this study amongst 2 groups of interns over 2 weeks' time span. There was significant difference noted in the post test results of the second group (Group 2, n=91) who were subjected to high fidelity simulation than the first group (Group 1, n=91) (Table 2). There was no statistical significant difference in pre-test scores of these two groups.

Table 2: Pre-test and post-test results following simulation sessions.

	Group 1 (n=91)	Group 2 (n=91)	t
Pre-test (Mean±SD)	4.160±2.111	4.000±2.057	0.53800 p=0.591 ns
Post simulation test (Mean±SD)	7.022±2.108	7.637±1.710	2.163 p=0.032

Table 3: Feedback from the interns following simulation sessions.

Item	N (%)	Strongly agree	Agree	Undecided	Disagree
I feel the simulation session was realistic	N1 (%)	5 (5.5)	15 (16.5)	40 (43.9)	31 (34.1)
	N2 (%)	68 (74.7)	21 (23.1)	2 (2.2)	
The simulation session was an interesting learning experience	N1 (%)	4 (4.4)	20 (21.9)	52 (57.1)	15 (16.5)
	N2 (%)	60 (65.9)	25 (27.5)	6 (6.6)	-
I feel it was easier to recollect following the simulation	N1 (%)	68 (74.7)	14 (15.4)	9 (9.9)	-
	N2 (%)	80 (87.9)	11 (12.1)	-	-
I feel that I am confident in executing decisions post simulation	N1 (%)	45 (49.4)	25 (27.5)	21 (23.1)	-
	N2 (%)	59 (64.8)	28 (30.8)	4 (4.4)	
I would like to have similar simulation sessions in future	N1 (%)	5 (5.5)	23 (25.3)	40 (43.9)	23 (25.3)
	N2 (%)	79 (86.8)	8 (8.8)	4 (4.4)	
I would like to suggest the next batch of interns to actively participate in simulation sessions	N1 (%)	20 (21.9)	25 (27.5)	11 (12.1)	35 (38.5)
	N2 (%)	88 (96.7)	3 (3.3)	-	-

N1=numbers in group 1, N2=numbers in group 2.

Feedback was collected from both the group participants which showed that, interns liked the high fidelity simulation session in terms of experience, reality, recollection of the steps, confident levels and they preferred this mode of training to them (Table 3).

DISCUSSION

Simulation in medical education is gaining more importance in the backdrop of competency based medical education curriculum by the Medical Council of India. It has been proved by earlier studies the effectiveness of students gaining skills and cognitive enrichment in simulated environment. We had subjected our previous batch interns to desktop simulation with a positive feedback and results. We introduced the present batch of interns to the high fidelity simulation and wanted to know the outcome in comparison with the desktop simulation. Our study was designed to subject the medical interns to two different models of simulation on triaging to compare the outcome. The results showed that students exposed to high fidelity simulation scored better compared to the

second group who had low fidelity desktop simulation sessions.

Experiential learning theory serves as the endoskeleton of simulation-based education.[9]

Advanced comprehensive clinical training and simulation centre (ACTS-YEN) of our university is equipped with the state of the art high and low fidelity simulators with task trainers for undergraduate and post graduate training for health sciences students.

Kolb characterize learning as a four-stage cycle. A learner engages in a "concrete experience," in our context, a simulated medical procedure or patient encounter, and the components of that experience form the basis for the second step of the cycle, "observation and reflection."[9-11] As a result of this second step, learners develop their internalized operational model for working through a procedure or encounter. In the third step, learners test their operational model in a new situation (another simulation or actual clinical encounter), resulting in additional concrete experience, and the cycle repeats itself, until if and when a learner achieves mastery.[12-14] According to Iputo et al, the introduction of the problem-based learning/community-based education (PBL/CBE) curriculum coincided with improved academic performance.[15]

In this study we found that, simulation close to reality leads to a significant increase in learning and recalling output compared to the desktop simulation. There was significant statistical improvement in the results following simulation. High-fidelity patient simulation is already integrated into medical training in couple of centres and their results are in accordance with ours.[16-18] The solution to the dilemma lies in "ascertaining the correct level of fidelity based on the student's current instructional level. As a student progresses, the appropriate level of fidelity should increase." Then, as now, this guidance is derived from cognitive-load theory.[19,20] Early learning should occur in relatively low-fidelity environments to reduce cognitive load.[20] Later learning can involve increased fidelity and resultant load, while approaching clinical practice.

In our study both the groups were not from same fidelity which forms the limitation of the study. Future scope of this study would be to compare high fidelity mannequins and human actors than using desktop simulation.

CONCLUSION

Simulation based training gives better results than compared to traditional teachings. High fidelity simulation is readily acceptable by the students for the close to reality experience and visual and audio remembrance. It's an advantageous educational tool with the potential to influence a student's feelings, beliefs and behaviours in relation to patient care. Although there are challenges surrounding the management of student anxiety, assessment and cost, careful preparation and planning for these issues are manageable.

ACKNOWLEDGEMENTS

We would like to acknowledge the contributions of Staff from the ACTS YEN Simulation Centre, the students from the hospital administration for enacting as patients and the emergency department of Yenepoya medical college hospital, Mangalore for handling the situation wisely.

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Conflict of interest: None declared
Ethical approval: The study was approved by the institutional ethics committee

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AHA accreditation

American Heart Association.

International Training Agreement

Company Information:

International Training Center ("ITC"):	Advanced Comprehensive Clinical Training and Simulation Center, Yenepoya University
Address:	University Road, Deralakatte,Mangalore, Karnataka 575018, India
Form of Organization:	Not for Profit / University

This Agreement is between the American Heart Association, Inc. ("AHA"), a New York not-for-profit corporation, having its principal offices at 7272 Greenville Avenue, Dallas, Texas 75231-4596, and ITC.

IN CONSIDERATION of the mutual promises contained herein, the parties agree as follows:

1. Term: Beginning Date: November 21, 2019. Ending Date: November 21, 2022. This Agreement will be in effect for a period of Three (3) calendar years. It may be renewed for additional one (1) year periods by letter issued from AHA.

2. AHA ECC Courses to be Taught by ITC:

Basic Life Support Provider Course(s)	Advanced Cardiac Life Support Provider Course(s)
Instructor Course(s)	Instructor Course(s)

3. Geographic Territory: India

4. Insurance: $1 million US

ITC will obtain and maintain at its expense, commencing upon the beginning date of this Agreement and during its entire term, liability insurance from a qualified insurance carrier, as set out above. This policy will specify that it may not be modified or canceled by the insurer, except after thirty (30) days prior written notice by the insurer. Upon execution of this Agreement ITC will provide the AHA with a certificate of insurance showing the required coverage.

5. Copyrights: ITC acknowledges and agrees that the AHA owns all copyrights in the ECC Materials, and ITC may not copy, or permit others to copy, distribute, perform or make derivative works based upon the ECC Materials, Course Completion Cards, or eCards.

6. Marks: ITC acknowledges the AHA's trademark rights and ownership of the name "American Heart Association", the heart-and-torch trademark and slogans (e.g., "Life is Why") (hereinafter "AHA Marks"). ITC will not use or display the AHA Marks. ITC shall not apply for any trademark registrations with respect to any AHA Marks or any marks similar to the AHA Marks.

7. Entire Agreement: This Agreement, including the terms and conditions set out on Page Two, contains the entire agreement between the parties relating to the rights granted and the obligations assumed.

EXECUTED by the parties on the date(s) set out below.

American Heart Association, Inc.	International Training Center
Signature:	Signature:
Name: Keith Jansen	Name: Dr Gangadhara Somayaji
Title: SVP, International	Title: Registrar, Yenepoya (Deemed to be University), Mangalore 575 018
Date: November 21, 2019	Date: 26.11.2019

ATTESTED

Dr. Gangadhara Somayaji K S
Registrar
Yenepoya (Deemed to be University)
University Road, Deralakatte
Mangalore 575 018, Karnataka.

8. **Definitions:**

(a) "Program Guidelines" means the current *Guidelines for Cardiopulmonary Resuscitation and Emergency Cardiovascular Care*, Program Administration Manual: Guidelines for Program Administration and Training (hereinafter "PAM"), and *AHA Instructor's Manuals*, as they may be amended and/or supplemented by the AHA from time to time.

(b) "Course Completion Cards" or "Cards" are defined as documents made available or provided by AHA, and which indicate a student's successful completion of a specified Course.

(c) "Course" or "Courses" are defined as those courses that follow the curricula of the AHA and teach emergency cardiovascular care according to the Program Guidelines.

(d) "ECC Materials" are defined as emergency cardiovascular care textbooks and materials published by the AHA.

(e) "eCards" means those electronic records that Training Centers may distribute to, or provide access to, students pursuant to Program Guidelines to indicate that the student participated in or successfully completed a Course.

(f) "Instructors" are individuals who have successfully completed AHA authorized Provider and Instructor training and who are authorized by ITC to teach Provider courses to other individuals.

(g) "Training Sites" are organizations engaged or authorized by ITC to teach Courses under the auspices of ITC.

9. **ITC Role and Responsibilities:**

(a) ITC will teach Courses only within the Geographic Territory, and agrees to do so in compliance with the Program Guidelines.

(b) ITC may contract with other entities (hereinafter "Training Sites") who agree to teach Courses under the direction and guidance of ITC. ITC assumes full responsibility for the actions and performance of the Training Sites, and will ensure that Training Sites teach in compliance with the Program Guidelines.

(c) Periodically, as requested by the AHA, ITC will provide the AHA with a current and accurate list of Training Sites, Instructors, the number of students taught, and such other information as may be requested by AHA but only to the extent allowed by local law and the terms of any applicable consent, if required.

(d) ITC will insure that each student has individual possession of an authorized Course-specific textbook before, during, and after training.

(e) ITC will be responsible for the issuance and security of Course Completion Cards and eCards as outlined in the Program Guidelines: (i) ITC will establish a system for ensuring that Cards are issued only to authorized Training Sites. (ii) ITC and its authorized Training Sites will only issue the appropriate course-specific Course Completion Card or eCard to each student who successfully completes the applicable Course.

(f) ITC will obtain any and all required licenses, permits or documentation and is solely responsible for compliance with all laws and regulations applicable to training activities conducted under this Agreement. ITC will obtain any required or appropriate consent from each student before sharing that student's name and Course completion information with the AHA through AHA's online systems (which systems may include data storage outside of ITC's Territory).

10. **Relationship of Parties:**

The parties acknowledge and agree that each is an independent entity and, as such, neither party may represent itself as an employee, agent, or representative of the other; nor may it incur any obligations on behalf of the other party.

11. **Termination:**

(a) The Agreement may be terminated by either party, without cause, upon sixty (60) calendar days' prior written notice.

(b) Either party may terminate this Agreement if the other party breaches any term or condition of this Agreement and fails to cure the breach within thirty (30) calendar days after receipt of written notice by the non-defaulting party. The following will also constitute breach or default under this Agreement: (i) Failure to exist or operate as a legal entity or to maintain an office address; or (ii) Assignment for the benefit of creditors, becoming generally insolvent, being placed in receivership or the filing by or against a party of a petition for bankruptcy or for entity reorganization under any bankruptcy act or similar statute.

(c) The AHA may terminate this Agreement upon written notice if it determines, in its sole discretion, that any of the activities permitted or contemplated under this Agreement pose a significant legal or business risk to the AHA.

(d) Notwithstanding anything to the contrary in this Agreement, AHA may terminate this Agreement if ITC or any Training Site conducts Courses in any country on which the United States government or other governmental entity (except those that are contrary to United States' laws), that (i) imposes sanctions that would prevent the AHA from conducting Courses either directly or indirectly in the country or (ii) for which ITC, Training Site or AHA must obtain a license from the applicable government to conduct Courses. If the United States government should impose sanctions on any country named in the Geographic Territory, the AHA at its option may (i) immediately terminate this Agreement as to that country in which event ITC and its Training Sites will immediately cease conducting Courses in the country, or (ii) may immediately terminate this Agreement in its entirety upon written notice to ITC.

(e) ITC will not distribute any AHA Course Completion Cards or eCards or designate itself, in any manner or any place, as an authorized ECC training center of AHA after this Agreement has been terminated or expired. In addition to any remedies by law or in equity available to AHA, ITC will pay the AHA Two Hundred Dollars (200 US$) as a penalty for each Course Completion Card issued after termination or expiration of this Agreement. Upon termination or expiration of this Agreement, AHA shall have no liability or obligations to ITC, and ITC shall retain no rights under this Agreement.

12. **Warranties:**

(a) ITC warrants and represents to the AHA that as of the effective date and at all times during the term of this Agreement: (i) ITC, its agents, affiliates, members, representatives, distributors, contractors, and Training Sites will be in compliance with this Agreement, the provisions of the U.S. Foreign Corrupt Practices Act and all applicable U.S., local, state and federal laws and regulations, and applicable laws or regulations of any jurisdictions whose laws may apply; (ii) ITC is not a tobacco company, or a tobacco company corporate subsidiary or parent, nor does it receive revenue from tobacco products. "Subsidiary" and "parent" are defined as an entity in which there exists a direct or indirect Five Per Cent (5%) or greater ownership interest by a tobacco company.

(b) EXCEPT AS EXPRESSLY SET OUT IN THIS AGREEMENT, THERE ARE NO WARRANTIES, EXPRESS OR IMPLIED, BY OPERATION OF LAW OR OTHERWISE.

13. **Indemnification and Liability:**

(a) ITC will indemnify, defend and hold harmless the AHA and its directors, officers, employees, agents, distributors, members, volunteers, successors and assigns from and against all suits, proceedings, actions, demands, claims, losses, liability, damages or expenses (including reasonable attorneys' fees and legal costs) arising from (i) ITC's performance or breach of its obligations under this Agreement, (ii) ITC's operation activities and/or distribution of Course Completions Cards, (iii) any breach or alleged breach of ITC's representations or warranties, (iv) any act or omission of ITC in any country in the Geographic Territory, and (v) any act or omission of Training Sites, Instructors, ITC's affiliates, agents, partners or representatives.

(b) The AHA will not be liable for any indirect, special, consequential or incidental damages, including lost profits or any other kind of damages, even if it has been warned of the possibility of such loss or damage. In no event will the AHA's liability under this Agreement exceed $1,000 (US$).

14. **Force Majeure:** Neither party will be in default under this Agreement, if such results, whether directly or indirectly, from fire, explosion, strike, freight embargo, vis major, or of the public enemy, war, terrorism, civil disturbance, act of any government, de jure or de facto, or agency or official thereof, labor shortage, transportation contingencies, unusually severe weather, default of manufacturer or a supplier, quarantine restrictions, epidemic, or catastrophe.

15. **Notices:** Any notice required or permitted under this Agreement, will be given in writing and will be deemed to have been duly given upon actual receipt if delivered personally or by courier with receipt obtained therefrom to the parties at their respective addresses.

16. **Miscellaneous Provisions:**

(a) This Agreement may not be assigned by ITC without the AHA's prior written consent.

(b) No amendment of this Agreement will be binding or enforceable on either party hereto unless in writing signed by both parties.

(c) Should any part, term, or provision of this Agreement be declared to be invalid, void, or unenforceable by a court of competent jurisdiction, all remaining parts, terms, and provisions hereof will remain in full force and effect, and will in no way be invalidated, impaired or affected thereby.

(d) This Agreement will be governed by the laws of the State of New York without regard to its conflict of laws provisions. Any controversy or claim arising out of or relating to this Agreement will be settled by arbitration in Dallas, Texas in accordance with the International Arbitration Rules of the American Arbitration Association. The language of the arbitration will be English. The arbitrators will have no authority to award punitive damages, and may not, in any event, make any ruling, finding, or award that does not conform to the terms and conditions of this Agreement. Judgment upon any award rendered through arbitration may be entered in any court having jurisdiction. Injunctive relief may be sought in any court of competent jurisdiction.

(e) This agreement contains the entire agreement between the parties and supersedes all prior written and oral communications. This Agreement will be written in and governed by the English language.

(f) AHA reserves the right to appoint other ITCs within the Geographic Territory.

(g) The following paragraphs and their subparagraphs will survive termination of this Agreement: 13 (Indemnification and Liability), 16(d) and 16(e)

ATTESTED

Dr. Gangadhara Somayaji K S
Registrar
Yenepoya (Deemed to be University)
University Road, Deralakatte

Conferences hosted

REPORT OF HPSN WORKSHOP

The Department of ACTS-YEN, Medical Education Unit, YMC, Mangalore, conducted, ON 3rd & 4th December 2016HUMAN PATIENT SIMULATION NETWORK (HPSN) INDIA 2016.T his is the first international healthcare simulation conference in India Organised by CAE, HEALTH CARE and co hosted by Yenepoya University and Father Muller Charitable Institutions on 3rd & 4th DEC 2016.

How to teach Human Factors in your simulation program :Professor Robert O'Brien from University of Melbourne was the resource faculty at the workshop. 20 delegates, including Heads of the departments of Yenepoya Medical College and other colleges, participated in the programme.

Ultrasound simulation (TTE Echo, TEE Echo, Chest, Vascular Access)

This work shop demonstrated cost and time effective ultrasound simulations using high fidelity CAE Vimedix Ultrasound Simulators and Blue Phantoms.

The Trauma Simulation, by Dr. Dinker Pai created a lot of interest amongst the delegates. Postgraduate doctors of various specialties and nursing staff teamed up to volunteer for the scenario. It was an interactive session with discussions to facilitate and improvise the performance of the participants. Hemodynamic and simulation, by Dr Poonam Malhotra, Professor, Department of Cardiac Anaesthesia-AIIMS, New Delhi and Simulation: An Effective method to assist New Graduates-Transition to Practice, by Dr. Rajiv Yeravdekar, Faculty of Health & Biomedical Sciences, Symbiosis International University were other interesting sessions. Dr Anand Hinduja conducted a session on Toxicological emergencies.This was followed by a talk on Centre Accreditation: Why? How? , By Ms Amanda Wilford.

Total 268 delegates participated in the entire session

Inaugural ceremony

Trauma scenario session

ATTESTED
Dr. Gangadhara Somayaji K S
Registrar
Yenepoya (Deemed to be University)

5/12/2016
Chief Co-ordinator, ACTS-YEN
Yenepoya Medical College Hospital
Mangaluru-575018

REPORT OF YUVS KSOGA CONFERENCE

Acts-yen conducted YUVA KSOGA critical care simulation workshop on 2nd September 2017 in association with OBG department. Three main Obstetric emergency case scenarios were performed –mainly PPH, Eclampsia and sepsis in obstetrics. Experts Dr. Tarakeshwari from Fernandez Hospital was one of the chief resource person. About 75 delegates from all over Karnataka participated.

Group Photo

Scenario session

ATTESTED
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