

## CURRENT USE OF PHYSIOTHERAPY PRACTICES IN THE INTENSIVE CARE UNITS OF PUNE CITY

**JENISA DOSHI<sup>1</sup>, RAZIA NAGARWALA<sup>2</sup>, ASHOK SHYAM<sup>3</sup>, PARAG SANCHETI<sup>4</sup>, SAVITA RAIRIKAR<sup>5</sup>**

1. Bachelor of physiotherapy, Sancheti healthcare academy
2. Masters in cardiovascular and pulmonary sciences, Head of department and Professor in cardiovascular and pulmonary sciences, Sancheti institute college of physiotherapy.
3. Research head, Sancheti institute of orthopedic rehabilitation
4. Research chairman, Sancheti institute of orthopedic rehabilitation
5. Dean and Professor, Sancheti institute college of physiotherapy

### ABSTRACT

**Background:** An intensive care unit (ICU) is a specialized hospital ward which is dedicated to the management of critically ill patients. Physiotherapists are an important part of the medical team providing rehabilitation to the patients with life threatening illnesses with recovery and majorly preventing the ICU related complications like muscle weakness, lung collapse, bed sore formation and functional disability. The outcome of rehabilitation depends on the knowledge and skills of the physiotherapist and hence it is vital to analyze the current physiotherapy techniques put to use in the ICU.

**Aim:** To study the current use of physiotherapy techniques in the intensive care units of Pune city.

**Method:** a cross sectional questionnaire survey was conducted among 63 physiotherapists working in the ICU of various multispecialty hospitals across Pune city.

**Results:** Descriptive statistics were used for analyzing the responses. Overall in this survey, diversities were noticed in the physiotherapy practices among hospitals across pune city, India. It was seen that 100% respondents were always monitoring all the investigation parameters like blood reports, X rays and ABG during the rehabilitation. Conventional physiotherapy techniques were more commonly notices in comparison to devices like acapella which were seen to be used only by 41% of the respondents. Only 44% of the respondents were involved in bed sore management.

**Conclusion:** All the physiotherapists posted on the intensive care units were observed very commonly using chest expansion techniques, positioning and active mobilization for rehabilitation of patients in the ICU. Conventional chest physiotherapy practices were more commonly used in comparison to adjunct devices. The physiotherapists treat patients on the basis of physician referral more commonly as compared to self assessment and routine treatment. The posting of the physiotherapists on overnight shifts and on public holiday is not seen in most of the hospitals.

**Keywords:** intensive care unit; critical; current techniques

### INTRODUCTION

Rehabilitative programs which restore human function, maximizes motor functioning, help in pain relief, prevent and treat physical challenges because of injuries and diseases are planned and implemented by physiotherapists<sup>1</sup>.

An intensive care unit is a specialized hospital ward which is heavily equipped and highly staffed which is dedicated in the management of critically ill patients with life threatening diseases or injuries and other complications. A physiotherapist is an important member of the entire medical team which provides the holistic spectrum of care to patients with acute respiratory illnesses and other impairments in a dynamic environment like the intensive care units.

Complications of the pulmonary, circulatory, musculoskeletal and integumentary systems are prevented and treated by physiotherapists working in the intensive care

units by gradual mobilization, active movements, proper positioning and chest physiotherapy<sup>2</sup>.

A high mortality rate is prevalent in the critically ill patients in the intensive care units despite of the documented recent advancements in medical treatment and mechanical ventilation. Also the patients in the intensive care units may suffer from cognitive impairments, muscle weaknesses and functional disability which may be prevalent for at least 1 to 3 years. Complications like hospital acquired pneumonia; lung collapse and severe weakness are long term whereas muscle atrophy is seen in a time span less than 7 days of the ICU stay<sup>3</sup>.

Improvement in the patient's quality of life and prevention of complications related to the ICU like physical de conditioning, respiratory complications and inability to wean from ventilator are the main of the physiotherapists working in the ICU. Functional debility is seen in at least 50% of the patients in the ICU<sup>4</sup>.

Knowledge of the physiotherapists about various techniques, education about the use

of appropriate skills and modalities, availability of apparatus, ratio between patient and physiotherapist, presence of chest physiotherapists and the medical treatment of the patient are different factors which affect the physiotherapy practice in the ICU.

Physiotherapy is the most critical part in the management of ill patients and when used at the correct time, ICU complications can be prevented in many patients<sup>5</sup>.

The physiotherapy techniques, devices and adjuncts used in the ICU may differ depending upon the patient co-operation, illness, injury, impairments and diseases.

There is no information about the physiotherapy practices in the ICUs of Pune city. The purpose of this study is to find what practices physiotherapists perform in the ICUs.

## AIM AND OBJECTIVES

### AIM

The aim of this study is to obtain data on current physiotherapy practices in intensive care units of Pune city.

### OBJECTIVES

- To find out which physiotherapy practices are currently in use most commonly in the intensive care units in Pune.
- To study if conventional physiotherapy is used in combination with other adjuncts to airway clearance
- To study about the availability of devices to deliver physiotherapy in intensive care units
- To find out if physiotherapists are involves in practices like weaning, suctioning, mechanical ventilation etc.
- To find out the physiotherapy protocol in the intensive care units to prevent complications during ICU recovery and speedy recovery of the critically ill patients.

## METHOD AND METHODOLOGY

Study design is and cross sectional survey which was carried across the multispecialty hospitals across Pune city.

Participants were the physiotherapists working in the intensive care units, PG students. All physiotherapists working in a time span of 1 month to 11 years were included. Under graduate interns and students were excluded from the study.

75 questionnaires were personally handed over to the head of departments of physiotherapy of the concerned hospitals.

## PROCEDURE

After obtaining approval from the ethical committee of Sancheti healthcare academy. All multi-specialty hospitals across Pune city with intensive care units were shortlisted. Informed written consents were obtained from them for conducting research. A questionnaire based on their qualification profile of the physiotherapists, availability of equipment in the ICU and the physical therapy protocol was handed personally to the head of department of the intensive care unit. Aim and objective of the study was clearly stated in the cover letter attached to the questionnaire. Physiotherapists working in the intensive care unit were asked to fill the questionnaire. The respondents were made clear that their identity will not be revealed. A period of 1 week was given to them for the completion of the questionnaire.

## RESULT

**Gender:** Out of 63 physiotherapists working in the ICU it was noted that 64% were females and 36% were males.

**Qualification:** The qualification of the responding physiotherapists was as follows: 53% were BPTH 3% were PG students, 42% were MPTH and 1% were PhD.

**Work experience:** 39% of the physiotherapists worked in the concerned hospitals for a period between 1 to 5 years. 30% of the respondents were practicing for less than a year and 2% of the respondents for a period of more than 10 years and 29% of the respondents for a period between 5 to 10 years.

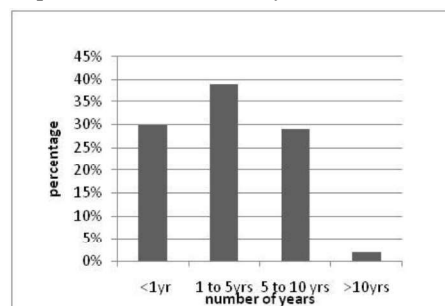


Figure 1: Work Experience

**Trained in CPR:** Out of 63 physiotherapists, 47 were trained in cardio pulmonary resuscitation

**Patients seen are on:** Out of 63 physiotherapists, 49 see patients on physician reference and 14 see patients on routine assessments

**Posting schedule:** Out of 63 physiotherapists, 19 are posted permanently in icu and 44 are posted on rotation from wards

**Overnight shifts:** Out of 63 physiotherapists, 39 physiotherapists work on over night shifts

**Sunday duties:** Out of 63 physiotherapists, 34 worked on Sundays and public holidays

#### Monitors

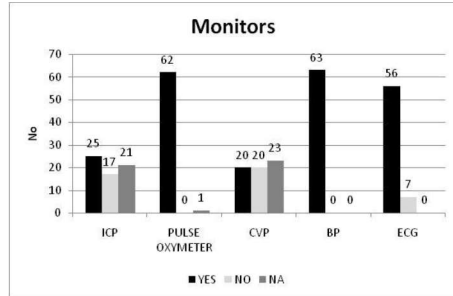


Figure 2: Monitors

Intracranial pressure monitoring, when available, was utilized by 25 respondents; 21 respondents had reported that ICP monitoring was not available. Oxygen saturation monitoring was appreciated by 62 respondents. The graph provides description about the usage of others parameters that are monitored and investigations looked for in planning the physiotherapy.

**Investigation studies:** Monitoring and clinical investigations used by physiotherapists in the neurological ICU as part of their assessment. All the 63 physiotherapists are involved in monitoring all necessary parameters before, during and after the treatment sessions.

**Positioning:** Out of 63 physiotherapists, 45 are involved in positioning as a priority in the treatment.

#### Treatment techniques in intubated and non-intubated patients:

##### Airway clearance techniques:

The use of airway clearance techniques is depicted in the graph below. Suctioning is regularly practiced by all the respondents. Clapping and vibration is practices by 80% and 93% of the respondents' respectively. It is observed that 58% of the physiotherapists are always involved in giving proprioceptive neuromuscular facilitation for respiratory muscles and 63% are always involved in postural drainage depending upon the condition of the patient all the physiotherapists use this technique with proper positioning to achieve removal of secretions. Over 98% of the physiotherapists are involved in postural drainage.

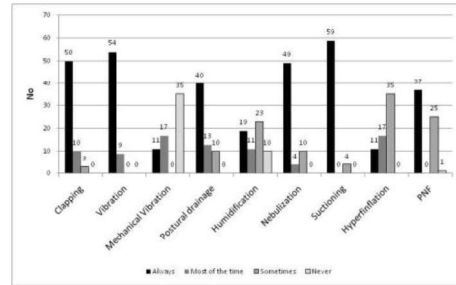


Figure 3: Airway clearance techniques

##### Lung expansion therapy:

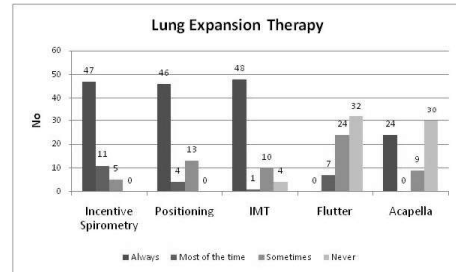


Figure 4: Lung expansion techniques

The graph provides the information about the frequency of usage of lung expansion therapy used by the respondents. Inspiratory muscle training (IMT) was used by nearly 94% physiotherapists on patients with respiratory muscle weakness. Only 76% of the physiotherapists used it more frequently. Use of conventional as well as adjunct devices for treatment is seen within the respondents but the use of adjunct devices like acapella is seen as less as 41% on routine basis.

#### Specific treatment in non-intubated patients:

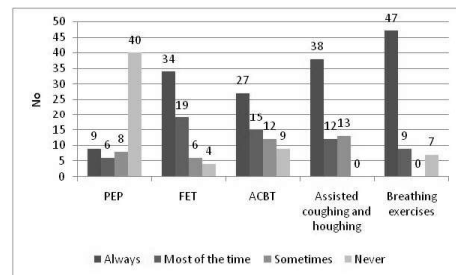


Figure 5: Specific treatment in non intubated patients

It was observed that active cycle of breathing technique (ACBT) (85%), forced expiratory technique (94%) and autogenic drainage (100%) are being used more by the physiotherapists compared to standard positive expiratory pressure (PEP) device (39%) and Flutter/Acapella device (38%). Though some techniques are used less frequently and only when appropriate to the patients, the graph above

depicts the usage of the specific techniques by the physiotherapists for treatment of non-intubated patients.

#### Involvement in other methods

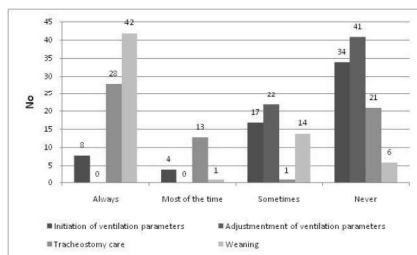


Figure 6: Involvements in other methods

Only 12% of the physiotherapists were always informed with the initiation of ventilator settings whereas 66% of them adjusted the parameters as an when required during the treatment. Only 44% of the respondents were routinely involved in tracheostomy care and 63% were regularly involved in weaning from ventilator.

#### Early mobilization

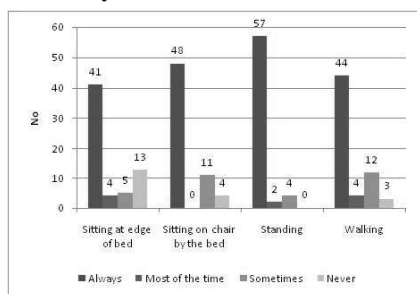


Figure 7: Other methods

The above graph depicts the different methods mobilization and the frequency of their usage in the intensive care units across Pune. Sitting at the edge of the bed was less frequently seen as compared to sitting in the chair by the bed. Standing and walking are routinely practiced by the physiotherapists for better and speedy functional recovery of the patients suffering from critical and life threatening conditions.

#### Exercises of the extremities

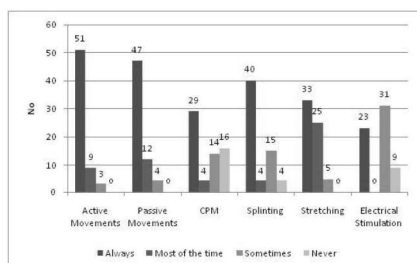


Figure 8: Exercises of the extremities

Exercises to extremities are given maximum importance in the intensive care units across Pune as seen by 51 therapists who use active movements, all the 63 who employ passive movements, 59 who use splints and 58 who provide stretching for the extremities. However, only 23 therapists use electrical stimulation in the intensive care units. Continuous passive movements are routinely employed by 44% of the respondents depending upon the motor function and condition of the patient.

#### Bed sore management:

This study shows that 46% of the responding physiotherapists were not frequently involved in bedsore management and 44% were routinely involved.

## DISCUSSION

75 questionnaires were handed personally to the head of departments of physiotherapy of hospitals across Pune out of which 63 were received back with a wonderful response rate of 84%.

This study was done to analyze the ongoing physiotherapy practices in the most required unit of the hospital that is the intensive care unit. There was a variation seen in the qualifications, work experience, training, skills and techniques. It was observed that 53% of the respondents were qualified as bachelors in physiotherapy and 42% were masters in physiotherapy. In a study done by UjwalYeole et al, in 2015 it was noted that only 15% were masters in physiotherapy which contradicts the findings here<sup>9</sup>.

It was observed in this study that 77% of the physiotherapists saw patients on basis of “physician reference” and 22% of the respondents treated patients on the basis of routine assessment which goes hand in hand with the findings observed by Bhatt et al.in which the majority of physiotherapists (73.2%) required neurologists/neurosurgeon's referral to treat the neurological ICU patients, whereas 23.2% treated patients on routine assessment<sup>5</sup>. Also a survey conducted by Yeole et al. recorded that 58% of the respondents treated patients on physician reference and 39% of them initiated patient treatment based on routine assessments. From the observation of this finding it is clear that the treatment in the ICU is largely physician referred whereas it should be for the physiotherapist to diagnose and treat each and every patient in the unit based on daily assessment<sup>9</sup>.

Training in cardiopulmonary resuscitation (CPR) is an important part for all the physiotherapists handling such critical

patients. It is noted that 78% of the respondents in this study are trained in CPR whereas according to the survey conducted by Bhatt et al. only 60% of the therapists are certified in CPR<sup>5</sup>.

Monitoring of parameters is critical in treatment of patients and in this survey it was recorded that only 38% of the respondents took a look at intra cranial pressure while treating as it is seen in Figure 2. The oxygen saturation of the patient is a useful indicator of the metabolic requirements of the brain when the intracranial pressure monitoring is unavailable and it was recorded that a good percentage of 95% were aware of monitoring SpO<sub>2</sub> before, during and after the treatment sessions but the central venous pressure monitoring has a bad response in that it is monitored only by 31% of the participants.

This study noted that all the respondents were monitoring the blood pressure, oxygen saturation, mechanical ventilator parameters and echocardiography during, before and after the physiotherapy treatment sessions. The physiotherapists working in the intensive care units were involved in the monitoring of the X ray and the ABG in order to plan a proper rehabilitation program for the patients. Complete blood count gives an approximate about the hemoglobin, total leucocyte count, platelet levels, coagulation status and the erythrocyte sedimentation rate which plays an important role in the physiotherapy to the patients.

Conventional chest physiotherapy techniques are routinely practiced in ICU. Nearly 98% of the respondents reported that they provide postural drainage to the patients in the ICU as seen in Figure 3. However, this survey did not assess the details of modifications made in the postural drainage positions for the patients. From this study, it is evident that nearly 99% of the physiotherapists were involved in suctioning procedures seen in Figure 3. Tracheostomy care is crucial part of bronchial hygiene therapy. This study revealed that only 44% of the physiotherapists provided tracheostomy care for the patients in the ICU. This survey revealed that most of the physiotherapists practiced ACBT and autogenic drainage technique. However, the results should be interpreted with caution as these techniques cannot be easily administered in head injured or in patients with altered sensorium.

In patients who are unable to obey commands, proprioceptive neuromuscular facilitation (PNF) techniques may be of value in increasing air entry and help propel the secretions toward trachea. According to this survey, only 58% of physiotherapists practiced PNF techniques in the ICU patients for lung expansion therapy when appropriate (Figure 3).

During this survey, it was observed that majority of physiotherapists (90%) always performed chest wall techniques. The role of the physiotherapist in weaning a patient from a ventilation circuit to spontaneously breathing includes numerous techniques that are based on skill and knowledge. These roles involve the decision-making such as when weaning should begin, weaning strategies, mode of ventilation, and whether use of noninvasive ventilation (NIV) is appropriate.

It was observed that 12% of the respondents were always involved in setting ventilator parameters while 53% opinions were always taken before weaning a patient from the mechanical ventilator. 66% respondents were involved in decision-making in extubation. Yeole et al. reported that 10% of respondents were involved in setting ventilator parameters and 18% were involved in weaning<sup>9</sup>.

From this survey, use of devices for AC such as Acapella/Flutter device and PEP were reported by about 35-45% of the physiotherapists for suitable patients which is less as compared to use of manual techniques of physiotherapy for the concerned patients (Figure 4).

Bed sores are very commonly seen in bed ridden patients. Since the patients in the ICU suffer from critical conditions they can remain on bed for a long period of time and bed sore management is very crucial but only 44% of the total respondents show active participation in bed sore prevention as a part of their rehabilitation.

Overall in this survey, variations were observed in physiotherapy practices within hospitals across Pune city, India. This diversity needs to be explored by future study for variables such as physiotherapist's qualification, years of experience, attendance of seminars, type of hospital, referral system, availability of physiotherapist during night and preferred physiotherapy techniques.

## CONCLUSION

All the physiotherapists posted on the intensive care units were observed very commonly using chest expansion techniques, positioning and active mobilization for rehabilitation of patients in the ICU. Conventional chest physiotherapy practices were more commonly used in comparison to adjunct devices. The physiotherapists treat patients on the basis of physician referral more commonly as compared to self assessment and routine treatment. The posting of the physiotherapists on overnight shifts and on public holiday is not seen in most of the hospitals. More experience, knowledge and skill are required among the physiotherapists. The response rate low and

hence there is need to carry out this study on a larger scale with higher response rate. The use of physiotherapy in the ICU must be thoroughly evaluated in terms of effectiveness after proper consideration of the patient condition.

## REFERENCES

1. Classification of Health Workforce Statistics, World Health Organization. Available from: [http://www.who.int/hrh/statistics/health\\_workers\\_classification.pdf](http://www.who.int/hrh/statistics/health_workers_classification.pdf)
2. Stiller K. Physiotherapy in intensive care: Towards an evidence based practice. *Chest*. 2000;118:1801-13.pubmed.
3. Herridge MS, Tansey CM, Matteos N, et al. Functional disability 5 years after acute respiratory distress syndrome. *N Engl J Med*. 2011; 364..:1293-130.
4. Stevens RD, Dowdy DW, Michaels RK, Mendez-Tellez PA, Pronovost PJ, Needham DM Neuromuscular dysfunction dysfunction acquired in critical illness: A systematic review. *Int Care Med* 2007; 33(11): 1876-1891.
5. Bhat A, Chakravarthy K, Rao BK. Chest physiotherapy techniques in neurological intensive care units of India: A survey. *Indian J Crit Care Med*. 2014; 18:363-8.
6. NicolinoAmbrosino, MD, and Dewi N. Makhabah MD. Physiotherapist in the ICU. *RT magazine*. 2014. Rtmagazine.com.
7. Gosselink R, Bott J, Johnson M, Dean E, Nava S, Norrenberg M, et al. Physiotherapy for adult patients with critical illness: Recommendations of the European respiratory society of intensive care medicine task force on physiotherapy for critically ill patients. *Intensive Care Med*. 2008; 34: 1188-99.
8. Clini E, Ambrosino N. Early physiotherapy practice in intensive care units in Australia, the UK and Hong Kong. *Physiotherapy theory Pract*. 1992; 8: 39-47.
9. Ujwal Y, Ankita R, Roshan G. Physiotherapy practices in intensive care units across Maharashtra. *Indian J Crit Care Med*. 2015 Nov; 19(11): 669-673.