

## Original Article

**Constructing Patient Example for Teaching Medical Students: Implementing A WHO Initiative.**

Vidushi Sharma, Hira Bhalla, Prem Prakash Khosla

**Abstract****Background**

With the competency based medical education, a medical graduate now require to have clinical skills and critical thinking in addition to memorization of facts as was required earlier. Therefore, to keep pace with changing scenarios, new methods and tools for medical teaching and training are required. The present case was designed by using WHO's guide to good prescribing to serve as a tool for teaching pharmacotherapeutics to under graduate students.

**Material and methods**

The study was conducted at Subharti Medical College, Meerut and MMIMSR, MMDU, Mullana, Ambala after ethical approval. The case was reviewed and modified by focus group of 20 medical teachers and implemented on 30 consenting students. Teachers were given a checklist to assess domains of learning covered in the case. Views on attitude, effect on future clinical practice, utility for group discussion, horizontal, vertical integration and linker purposes were also recorded. Students evaluated adverse drug reactions and medication error. Time taken was recorded.

**Results**

Time taken to assess medication error by students was 6±2 minutes and 15±6 minutes for adverse drug reactions in this case. 27/30 (90%) students felt this activity will improve their knowledge, understanding, and critical thinking in safe use of drugs. Time taken by teachers for case discussion was 90 ±10 minutes. They found it useful for horizontal (90%), vertical integration and as linker purposes(85%).It was found useful for problem solving skills (100%), remembering (70%), understanding (95%), improving attitude (85%) and better practice (85%).

**Conclusion**

Following Medical Council of India and WHO's suggestions clinical cases can be designed and used for integrated training and improving higher domains of learning.

**JK-Practitioner2019;24(3-4):28-31****Introduction**

In the new medical education regulations there is focus on competency, skills, and problem solving. An aspiring doctor are now required to have critical thinking and clinical reasoning in addition to conventional aspects that focused mainly on student's knowledge of facts to be remembered for teaching pharmacology. The emphasis has now shifted from experimental pharmacology and pharmacy preparations to rational and evidence based pharmacotherapeutics; to develop student's ability to understand reason and relate the drugs prescribed with the disease<sup>1,2</sup>. Although need for change has been highlighted but alternative teaching learning exercise have not been prepared and implemented. Thus, this clinical case was written as per World Health Organization endeavour to clinical case

**Authors Affiliations****Vidushi Sharma**

Assistant Professor;

**Prem Prakash Khosla,**

Professor,

Department of Pharmacology,  
MMIMSR, Maharishi Markandeshwar  
Deemed to be University (NMDU),  
Mullana, Ambala

**Hira Bhalla,**

Profesor,

Department of Pharmacology  
Subharti Medical College ,Meerut.

**Correspondence**

Dr. Prem Prakash Khosla, Professor,  
Pharmacology, MMIMSR,NMDU,  
Mullana, Ambala  
Email: khoslapp@gmail.com

**Indexed**

Scopus,INDMED ,EBSCO & Google  
Scholar among others

**Cite this article as:**

Sharma V, Bhalla H, Khosla PP.  
Constructing Patient Example  
for Teaching Medical Students:  
Implementing A WHO Initiative.  
.JKPractitioner2019;24(3-4):28-31

Full length article available for  
download at [jkpractitioner.com](http://jkpractitioner.com) two  
months after publication

**Key Words:** Medical Education,  
Patient Involvement

based training of medical students.

### Material and methods

The study was done at Subharti Medical College, Meerut and MMIMSR, MMDU, Mullana, Ambala. A clinical case was constructed using tips given in WHO's guide to good prescribing<sup>3</sup> and standard treatment guidelines<sup>4</sup>. The case was reviewed by focus group of 20 medical teachers and 30 students consenting to participate as per qualitative method<sup>5</sup> of research. Suggestions given by them were incorporated. The teachers were given a checklist and asked to check the sub domain of Blooms taxonomy of learning covered by this case<sup>6</sup>. They were also asked to give views on attitude and future clinical practice that such case will have on learners. They were also asked to assess it for utility of this case for group discussion, horizontal integration, vertical integration and linker purposes and list applied topics and subjects covered by it. Volunteer students of MBBS and pharmacy discipline (n=30) were trained<sup>7,8,9,10</sup> for causality, severity, preventability assessment and errors of medication. They were given the case and asked to identify adverse effects and do assessment using WHO-UMC causality scale<sup>7</sup>, Modified Hartwig criteria of severity<sup>8</sup> and Schumock and Thornton preventability scale<sup>9</sup>. Index for Medication errors by National Coordinating Centre for Medication Error Prevention was used for categorising medication errors<sup>10</sup>. Time for reviewing case for adverse drug reaction and medication error was recorded. A modified retro-pre questionnaire was used focussing only on change produced in them by this training<sup>11</sup>.

### Clinical Case:

Ms. LK, 60 F was hospitalized with soft tissue injury of thigh and complaint of severe pain. An Xray femur was done to rule out any fracture. She was managed by immobilization, tablet tramadol and tablet chlorzoxazone. After one week she was advised to move around with help of an attendant. In toilet she fell on switch with wet hands, got electric shock and fainted. Her attendant called ward resident who for cardiac arrest gave her basic life support and Inj. Adrenaline (1 in 10,000) 1 mg intravenous along with 50 ml of Sodium bicarbonate solution followed by Calcium chloride. The doctor on duty found it difficult to push the fluid and on close inspection, observed an opaque white material in tubing. He immediately withdrew most of opaque precipitate back and discarded. Further 10ml normal saline was pushed to clear the IV line from possible remnants of obstructing material. In mean time when venous cannula was being cleaned of opaque precipitate she was given Inj. Adrenaline 1 mg intramuscular to compensate loss of adrenaline due to white precipitate formation. On recovery of spontaneous heart beat and breathing, LK was shifted on intensive care unit bed and put on monitoring. After about 30 minutes, LK complained of pain in chest and shortness of breath. Electrocardiogram did not show any changes for ischemic heart disease, trop T was negative and there was no significant finding in chest X ray. However, there was sinus tachycardia followed by McGinn White sign (seen in 10% cases of pulmonary embolism). She was given oxygen and breathing support with positive air pressure machine, and in the ICU she was treated with Inj. Urokinase 4400 units/kg over 10

Parameters	Teachers, n=20 (%)	Parameters	Teachers, n=20 (%)
Horizontal integration*	18 (90) agree 2 (10) partly agree	Analysis (Understanding) **	19(95) agree 1(5) partly agree
Vertical integration*	17(85) agree 3(15) partly	Creation/ Alternatives**	18(90) agree 2(10) partly
Linker use*	17(85) agree 3(15) partly agree	(Synthesis) /Problem solving**	20(100) agree 0-partly agree
Knowledge (Remembering) **	14(70) agree 6(30) partly agree	Attitude (affective domain) **	17(85) agree 3(15)partly agree
Comprehension (Understanding)**	19(95) agree 1 (95) partly agree	Practice **	16(80) agree 4(20) partly agree

\*New Medical council guidelines for MBBS teaching

\*\*Blooms taxonomy of learning Pharmacology related topics

minutes followed by 4400 units per kg/per hour by continuous intravenous infusion. After one-day, LK was comfortably breathing, with normal blood pressure and heart rate. Trop T remained negative on repeat test at 2, 6, 12 and 24 hours. Thereafter, LK was put on Inj. Heparin by intravenous infusion at the rate of 500 IU/hr. After one day of starting Heparin, LK had a nose bleed and hematuria. Her aPPT was found to be raised >60 sec (normal range: 20-36 sec). Heparin was stopped and after ruling out any hypersensitivity to fish or sea foods, Inj. Protamine sulphate 1mg/100 units of heparin (50 mg) was given by slow intravenous injection over 10 minutes. Repeat aPPT after 2 hours was 30 sec. Subsequently Ms. LK was put on Inj. Enoxaparin 60mg subcutaneous 12 hourly. After 3 days she was shifted on oral Warfarin 4mg once daily at 6 PM with monitoring of INR on days 1,3 and 5 (maintenance INR: 2.2-5) with a follow up after 7 days. Tablet tramadol was replaced by tablet paracetamol and dose of chlorzoxazone was reduced to half and LK was counselled of methods to avoid sudden falls.

#### Observations

#### Rating by teachers on teaching learning parameters:

Pharmacology related topics covered:

- Precaution with use of drugs like tramadol and chlorzoxazone and geriatric concerns affecting posture and risk of fall.
- Cardiac arrest and uses of sympathomimetic drugs.
- Pharmacotherapy of pulmonary embolism, fibrinolytic drug, anticoagulants, advantages of low molecular weight heparin, oral anticoagulants, treatment of heparin toxicity.
- Risk factors for pulmonary embolism, monitoring for safe use of anticoagulants.
- Assessing error of medication, pharmaceutical interaction.
- Identifying an adverse drug reaction and evaluating causality, preventability and severity assessment.
- Horizontal integration, vertical integration and use as linker topic.

#### Topics covered for Integration:

The minutes of discussion were noted down and following list was prepared as per methodology of qualitative research. It covers: (i) Applied anatomy of lower limb injury (ii) Physiological aspects of cardiac arrest (iii) Posture & maintenance of balance (iv) Biochemical aspects of tests done in myocardial infarction (vi) Patho-physiological aspects of pulmonary embolism and myocardial infarction (vii)

Pharmacology/Toxicological concerns of overdose and management. (viii) Orthopaedics (ix) Surgery and (x) Internal medicine and (xi) Geriatrics aspects. Time Taken and students feedback:

Time taken by students for assessing errors of medication by students:  $6 \pm 2$  (range 3-9 minutes) minutes, causality/severity/preventability parameter:  $15 \pm 6$  minutes. In response to retero-pre questionnaire 27/30 students (90%) felt that this activity will improve their knowledge, understanding, and critical thinking in safe use of drugs. Time taken by teachers for group discussion was  $90 \pm 10$  minutes. All teachers felt it will fit well for time table of graduate medical education where a two hours' slot is kept for practical/group/case discussions.

#### Discussion

This case was constructed as a clinical case covering topics from preclinical, para-clinical and clinical subjects to help develop students' basic understanding and clinical reasoning. Several meetings with clinicians from different specialties were held for their inputs to modify the case into a clinical scenario. The students were expected to understand the case narrative, identify and assess medication error and adverse drug reaction apart from as a pharmacotherapeutics teaching learning activity. Teachers assessment for time needed for this exercise for training of causality, preventability, severity and medication error was short (8- 10 minutes) but was long for case discussion for pharmacotherapeutics purposes (60-90 minutes), as it involved large number of topics, drugs, identification, management of side effects and planning alternative line of treatments and drugs. They had also taken in consideration; geriatric population, management of cardiac arrest, drug incompatibilities and medication error, risks of pulmonary embolism and pharmacotherapy, adverse effects of anticoagulants, assessment and further management.

#### Conclusion

Following medical council of India and World Health Organization suggestions integration can be done in new and alternative teaching learning exercise like clinical case discussion.

Conflict of Interest

None

#### Acknowledgement

We are thankful to Dr Rajit Jhingani M.D. (Anaesthesia), IDCCM for his support.

**References**

1. Medical Council of India Regulations on Graduate Medical Education. 1997. Available on: [http://www.mciindia.org/Rules and Regulation/GME\\_REGULATIONS.pdf](http://www.mciindia.org/Rules and Regulation/GME_REGULATIONS.pdf). [Last accessed on 5<sup>th</sup> Dec, 19].
2. Medical Council of India. Competency Based Undergraduate Curriculum. Medical Council of India. 2018. Available on: <https://old.mciindia.org/InformationDesk/ForColleges/UGCurriculum.aspx>. [Last accessed on 20<sup>th</sup> April, 2019].
3. How to construct good patient examples- in Teachers guide to good prescribing, published by World Health Organisation, Department of Essential Drugs and Medicines Policy, Geneva, Switzerland. Available on: WHO/EDM/PAR/2001.2. [Last assessed on 1<sup>st</sup> Dec, 2019]
4. Standard Treatment Guidelines: A Manual for Medical Therapeutics. Sangeeta Sharma, GR Sethi, (eds) Publisher Delhi Society for Promotion of Rational Use of Drugs and Wolter Kluwer Health, Delhi, 5<sup>th</sup> Edition, 2018.
5. Hammarberg K, Kirkmanand M, Lacey S. de. Qualitative methods of research: when to use them and how to judge them. Human reproduction, 2016: 31(3): 498-501,
6. Bloom BS. Taxonomy of educational objectives: the classification of educational goals. New York NY: Longmans, Green;1956.
7. The use of the WHO-UMC system for standardized case causality assessment. World Health Organisation (WHO)- Uppsala Monitoring Centre. Available on <http://www.whoumc.org/graphics/24734.pdf> [Last accessed on 5<sup>th</sup> Dec, 2019.
8. Hartwig S, Siegel J, Schneider P. Preventability and severity assessment in reporting adverse drug reactions. Am J Hosp Pharm. 1992;49(9):2229-2232.
9. Lau P, Stewart K, Dooley M. Comment: hospital admissions resulting from preventable adverse drug reactions. Ann Pharmacother. 2003;37:303-304.
10. National Coordinating Council for Medication Error Reporting and Prevention (NCCMERP), Available on <http://www.nccmerp.org> [Last assessed on 5<sup>th</sup> Dec, 2019].
11. Skeff, K.M., Bergen, M.R., Stratos, G.A.(1992) Evaluation of a medical faculty development programme: A comparison of traditional pre/post self –assessment ratings. Evaluation and Health care professionals, 15, 3,pp. 350-366.