

## Inappropriateness Admissions and Inpatients in Imam Khomeini Hospital of Tabriz University of Medical Sciences

<sup>1</sup>Bakhtari Aghdam, <sup>1</sup>Vahidi Reazagoli, <sup>2</sup>Noorizade Rogaye

<sup>1</sup>Mohammadpoorasl Asghar and <sup>3</sup>Kavoosi Zahra

<sup>1</sup>Department of Public Health, National Public Health Management Center,  
Tabriz University of Medical Sciences

<sup>2</sup>Marand University

<sup>3</sup>Department of Health Management and Economics,  
School of Public Health and Institute of Public Health Research,  
Tehran University of Medical Sciences, Iran

**Abstract:** The evidence implicate that 50-80% of government expenditure in health sector specialized to hospitals and educational treatment centers. Therefore, these centers have efficient and important role in increasing or decreasing of expenditures. This study surveyed inappropriate admission and inpatients in Imam Khomeini educational and treatment centre. We used the Appropriate Evaluation Protocol (AEP) to evaluate the appropriateness of 268 admissions and inpatients in Imam Khomeini educational and treatment centre. The petitions selected through random sampling as well as demographic criteria of them were registered then for analysis of data was used from t-test and  $\chi^2$ . Our findings showed that 6% of admits and 8.6% of inpatients were in appropriate. There was remarkably association between inappropriate admission and disease diagnostic ( $p = 0.038$ ) but there weren't any association between inappropriate inpatient with age, gender, type of insurance and disease diagnostic. In this study, there was no association between inappropriate admission and inpatient among weekend and non weekend days. Reducing inappropriate hospital stay increase hospital productivity and decrease waiting list without decreasing quality of care; in the other hand inappropriate hospital stay increase hospital costs and risks of nosocomial infection. There are several tools to measurement of inappropriate admission and patient day that among them. With respect to our results, could be thought important step to preventing of inappropriate admission and decreasing inappropriate in patient to limit using from sources.

**Key words:** Appropriateness evaluation protocol, inappropriate patient stay, inappropriate admission, insurance, disease diagnostic

### INTRODUCTION

In all health care systems, the use of hospital beds is an issue of concern both to policy-makers and practitioners (Marian *et al.*, 2000). In the most country health systems including Iran, hospital services account for a substantial share of expenditures (it is estimated 50-80% for Iran). Numerous studies have documented that hospital admission and inpatient may be inappropriate or unnecessary in certain situations (Payne, 1987; Siu, 1986; Campion and Bang, 1983; Comell *et al.*, 1981). Thus improving the efficiency of hospital services by avoiding inappropriate hospital admission and stay can lead to improve the productivity of the hospital and reduce the waiting list and at last optimal use of existing health care facilities (Panis *et al.*,

2003) without compromising quality of care (Kossovsky *et al.*, 2002). Furthermore, eliminating inappropriate hospital stay decreases hospital costs and the risks of nosocomial infection as well as increases available resources for patient with critical condition.

Studies on over-hospitalization have relied on measurement of unnecessary hospital admissions and Inappropriate Patient Days (IPD). Appropriate admission is defined as "those patient for whom there is no alternative to admission to the hospital with high-technology facilities. This would be the case even if lower-technology alternatives to hospital admission existed". In the other word, there may potentially be a lower-technology alternative to admission to hospital for patients whose admissions are determined as inappropriate.

Appropriate hospital stay can be defined as “inpatient stay requiring continuous and active medical, nursing or paramedical treatment which couldn’t be providing through external care, daycare or outpatient care (Hartz *et al.*, 1996). In the other words appropriate stay is up to standard, effective, efficient and tailored to the patient’s actual needs “(2a). Inappropriate patient stay is neither effective (it serves no clinical purpose) nor efficient (resources can not be used optimally) (Panis *et al.*, 2003).

Although most studies worldwide have looked at appropriateness and quality of hospital care, up to now, limited studies have been done in this subject in Iran. so in this study we attempt to measure the extent of inappropriate hospital admission and inpatient.

### MATERIALS AND METHODS

Various ways are used in attempt to quantify inappropriate use of hospital services. In this study we used Appropriateness Evaluation Protocol (AEP). It is criteria based tool for determining the medical necessity of hospital admissions and days of care which was published by Gertman and Restuccia (1981). The tool is designed specifically for acute, adult patient excluding Obstetrics and Psychiatry. The validity and reliability of the AEP has been tested extensively (Marian *et al.*, 2000). It has 2 groups of criteria, one for evaluating appropriateness of admissions and one for days of care.

Two main dependent variables were inappropriate hospital admission and inappropriate patient day of stay and independent variables included patients' demographic characteristics (age, sex, ...), hospital wards, insurance status and disease diagnosis. Present study was conducted at public university hospital (Imam Khomeini hospital, Tabriz, Iran). In this study, appropriateness of admission and inpatients of 268 (the sample size determined using statistical formula) by convenient sampling method selected patients was assessed consecutively using Appropriateness Evaluation Protocol (AEP).

In order to collect data 4 nurse students trained using AEP cooperated in the study. At the first day of study, they presented in several predetermined wards of hospital

by convenient sampling method then their admissions and inpatients had been evaluated in term of AEP criteria. In the next day plus, entering some new patients into study, the appropriateness of hospital stay of those patients had been entered study the previous day were also evaluated according to AEP appropriate day care criteria. In this way, admission and all days of hospital stay of each patient entered the study were sequentially assessed using AEP.

### RESULTS

In the first part of study 268 admissions were reviewed using AEP and findings showed that proportion of inappropriate admission was 6%. Kaisequer test was used to analysis relationship between various variables of study with inappropriate admission and findings indicated that.

Inappropriate admission (IP) had statistical significant association with diseases diagnosis ( $p < 0.03$ ); that is to say that new cases of diseases diagnosis had heigher inappropriate admission (Table 1).

The relationship of inappropriate admission was assessed by variables such as sex, age, disease diagnosis and insurance status that it showed no statistically difference (Table 1).

In the second part of study, inpatients of them were assessed consecutively using AEP. The percentage of inappropriate patient day was estimated 8.6%.

The means of Inappropriate Patient Day (IPD) and research variables were analyzed using T test and Kaisequer and the results indicated that didn't show any remarkably relationship between them (Table 1).

In this study 7.7% of inappropriate was in weekend days and 6.3% was in other days also 3.37% of inappropriate inpatient was in weekend days and 2.09% was in other days.

In this study there was no association between inappropriate admission and inpatient among weekend days with other days.

The mean of age in this study was  $43.32 \pm 21.0$  (min = 1, max = 90). The mean of length days of stay was  $4.17 \pm 3.18$  (min = 1, max = 20, median = 3). From 268 study population 59.7% was men and 40.3% was women.

Table 1: Comparing admission and inpatient status and study variable

Table 1: Comparing admission and inpatient status and study variables									
Inpatient					Admission				
p-value	Overall	(%) Inappropriate	(%) Appropriate	p-value	(%) Inappropriate	(%) Appropriate			
0.431	(8.6) 23	(13.0) 3	(87.0) 20	0.038	(17.4) 4	(82.6) 19			Disease diagnosis
	(91.4) 244	(8.2) 20	(91.8) 224		(4.9) 12	(95.1) 232			Old case; New case
				0.772					Sex
0.905	(59.7) 160	(8.8) 14	(91.3) 146		(5.6) 9	(94.4) 151			Male
	(40.3) 108	(8.3) 9	(91.7) 99		(6.5) 7	(93.5) 101			Female
0.712	(90.2) 230	(9.6) 22	(90.4) 208	0.998	(5.7) 13	(94.3) 217			Health insurance
	(9.8) 25	(4.0) 1	(96.0) 24		(4.0) 1	(96.0) 24			Have doesn't have
0.920		43.74±19.2	43.28±21.2	0.300	37.5±22.6	43.7±20.88			age*

\* Mean±standard deviation

## DISCUSSION

The level of inappropriate hospital admission (6%) estimated in the present study was similar to study of Turkish military hospital. (Neumann and Schultz, 2001). Reviewing other articles, we can say that level of inappropriate hospital admission nearly ranged between 4 (Demir *et al.*, 2002) -44.8% (Wolinsky *et al.*, 1987). Thollander *et al.* (2004) classified 23% of admissions as medically inappropriate based on AEP. Pileggi (2004) showed that 28% admissions to an Italic hospital were inappropriate.

Although findings about the scale of inappropriate hospital admission is an important consideration but the more important issue is how to manage these wastage of health system recourses.

Pervious study in Iran showed inappropriate admission was 22.9% in Tehran hospitals (Poorreza *et al.*, 2004). Inappropriate admission and inpatients rate in different geological areas might be due to the managed of admission process, bed occupancies rate, or financial issues. Although findings about the scale on inappropriate hospital admission is an important consideration but the more important issue is how to manage these wastage of health system recourses but in the most developing countries there is low knowledge about this problem that results from loss of studies in this filed.

The overall percentage of inappropriate patient day (8.6%) in Imam Khomeini hospital was consistent with the other study results which are mostly conduced in European countries and USA hospitals; Santos-Eggimann (1995) found that the level of inappropriate hospital use in 4 Swiss hospitals ranged between 8.3 and 15.3% for days ; Ghopard *et al.* (1998 ) showed that 28% of hospital days was inappropriate; and in studies we reviewed percentage of IPD ranged between 6.9 (Villatla *et al.*, 2004) -48% (Hartz *et al.*, 1996) however the most important questions that should be addressed are what the main causes of these IPD<sub>s</sub> are; and how it can be reduced. Our finding concern with the reasons for IPDs is given in Table 1. Santos-Eggimann *et al.* (1995) findings about main causes of IPDs included discharge planning, physician-related, scheduling investigations and waiting for surgery. Kossovsky *et al.* (2002) showed that modifying process of patient discharge would decrease inappropriate patient hospital stay from 28- 25%. Based on findings, it can be suggested that more than half of hospital inappropriate patient day is due to hospital internal factors that should be controlled by management through reengineering of processes, focus-PDCA and other methods of quality management.

## CONCLUSION

In order to reach an effective healthcare system, inappropriate use of hospital resources should be eliminated; target of achieving zero "IPS" and "IA" is somehow idealistic since there are always obstacles which can not be controlled by hospital as a organization by it own self. As all know hospital is a integrated part of each health system so we cant solve its problems and improve its productivity without considering the other parts of health system specially those which are in direct relationship with hospital.

Thereby, we suggested that the referral system in health system network should be improved, in order to reduce the self referrals and substaily inappropriate admission and inpatient.

## ACKNOWLEDGEMENT

We would like to thank Imam Khomeini managers for their permission to accomplish this study in hospital and who help us in collecting data.

## REFERENCES

- Campion, W. and A. Bang, 1983. Why acute care hospitals must undertake long-term care. *New Engl. J. Med.*, 308: 71-75.
- Comell, F., R. Day, J. Logerfo, 1981. Hospitalization of Medicaid children: Analysis of small area variation in admission rates. *Am. J. Public. Health*, 71: 606-613.
- Demir, C. *et al.*, 2002. Investigation of the correlation between inappropriate hospitalization stay rates: an application in medicine clinics of a military hospital. *Mil. Med.*, 167: 817-820
- Gertman, PM. and J.D. Restuccia, 1981. The appropriateness evaluation protocol: A technique for assessing unnecessary days of hospital care; *Med. Care*, 8: 55-71.
- Ghopard, P. *et al.*, 1998. Predictors of inappropriate hospital days in a department of internal medicine. *Int. Epidemiol.*, 27: 513-519.
- Hartz, J. *et al.*, 1996. The evaluation of Screening methods to identify medically unnecessary hospital stay for patient with Pneumonia. *Int. J. Quality Health Care*, 8: 3-11.
- Kossovsky *et al.*, 2002. Evaluation of quality improvement intervention to reduce inappropriate hospital use. *Int. J. Quality Health Care*, 14: 227-232.
- Marian, S. *et al.*, 2000. Measuring appropriate use of acute beds: A systematic review of methods and results. *Health Policy*, 53:157-184.

- Neumann, A. and H.J. Schultz-Coulon, 2001. Use of appropriateness evaluation protocol in inpatient ENT practice. *HNO.*, 49:12-20.
- Panis, L.J. *et al.*, 2003. Predictors of inappropriate hospital stay: A clinical study. *Int. J. Quality Health Care*, 15: 57-65.
- Payne, S.M., 1987. Identifying and managing inappropriate use of hospital utilization: A policy synthesis. *Health Serv. Res.*, 22: 709.
- Pileggi, C., 2004. Inappropriate hospital use by patients needing urgent medical attention in Italy. *Public Health*, 118: 284-291.
- Santos-Eggimann, B., 1995. Medical Appropriateness of hospital utilization: An overview of the Swiss experience. *Int. J. Quality Health Care*, 7:227-232.
- Siu, A., 1986. Inappropriate use of hospitals in randomized trial on health insurance plans. *New Engl. J. Med.*, 315: 1259-66.
- Thollander, J. *et al.*, 2004. Assessment of inappropriate emergency admissions. A study 566 consecutive cases. *Akartidningen*, 101: 888-892.
- Villatla, J. *et al.*, 2004. Appropriateness of hospitalization in a short stay unit of a teaching hospital. A controlled study; *Med. Clin.*, pp: 454-456.
- Wolinsky, F. *et al.*, 1987. The process and outcome of hospital care for Medicaid versus privately insured hospital patient. *Inquiry*, 29: 366-71.