



## The Study of Induced Demand Done CT scan Services in Imam Reza Hospital 2015

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## The Study of Induced Demand Done CT scan Services in Imam Reza Hospital 2015

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**Background:** considering to importance of perform the CT scan in diagnosis and remedy process, be high the buy and keeping cost of its and be high its payment cost for patient and insurance organization. **Aim:** this research was done in order to study of induced demand done CT scan services in Imam Reza hospital in 2015. **Materials and method:** this research is a type of descriptive-sectional research. To collecting data, all the accomplished CT scan services separation by its type and member of CT scan for patients, extracted from HIS system of hospital in 2014. Finally the data analyzed by SPSS 20 statistical software and calculated the Chi-square test. **Results:** all the people who used the CT scan services during 2014 to 2015 was 9078 that most prescription of CT scan is related brain by a number of 3260. And least prescription was related to spinal member including (spine, hypo phis, gullet) by a number of zero. Total number of normal CT scan was 3805 case and total number of abnormal CT scan was 5273 cases. **Conclusion:** to preventing from using this service verily, considering to it exceeding expense on both patient and insurance, commanded that identified the impressed factors of improper and incorrect use of this service, and trying to eliminate them by necessary training and present the replaced encourager to doctors and personnel of photography unit.

**Keywords:** induced demand, CT scan, Imam Reza therapeutic and educational center.



## **Introduction**

Using from medical technologies has fast and effective growing in diagnosis and remedy last years (1). By entering the diagnosis equipment to medical basis following many expenses and imposed many expenses to patients. Increasing deployment of para clinical services specially CT scan all over the country and easily access for doctors, insured and also exist the competition in market of medical attention for life remaining and continuous of CT scan center effect on increasing related expenses. On the other hand allocated financial resources to healthy were limited, and it is necessary that this limited resource managed that can be answering to unlimited needs and expectation to people of society (2). There is a clear relationship between available photography unit and use of them (1). This leading to benefit for patients undoubtedly, On the one hand entering the no limit and without control of this technologies maybe caused to induced demand from a side of services presented and irregular and unnecessary use of this services that develop this problem in many developing country (1). In some cases these technologies are not better than pervious technologies and there are not any evident about the well-being of patient in use of them; in addition, exceeding use of medical photography, maybe is not be able to improve the patient healthy condition. The studies show that 20 – 50 percent of photography methods that works by modern technologies are unnecessary (1). You should know that CT scan caused to spend time and cost, and the damage of exposing stream for patients and also the damage of injection of curtain matter by contrast is important issues that we noted. We noted that one of the issue indication CT scan is its negative and positive results that in false positive cases put the people in amiss surgeries and apply to unnecessary test and in false negative cases confident to doctor incorrectly and delayed the remedy of patient (3). Protect the people from disease cost and securing the justice in financial partnership of these expenses is the main purpose of health organization (4). Induced demand apply to control or sell the unnecessary services to patients and the people who references to healthy system that implanted to this system by using power and ordered to specialized people (4). induced demand was emerged by several factors of economic and structural, market of healthy, behavior of service receiving and its salesman and etc... , although induced demand focus on consulting and referring services, but sometimes composing the give on additional and unnecessary services by the first salesman and often interested in patient and trying to help to his/her persuade the doctor or healthy system employee to doing additional and unnecessary services (4). In a usual market, if increase the number of exhibitors so market become competitive and reduced the price in this market(5). but when we study and state the induced demand in CT scan market, we state that increase in number of doctors leading to increase request for accomplish CT scan services, so this leading to increase competition between doctors will leading to use of CT scan services (15,16). Fieldstone state that the number of doctors has negative relationship with amount that received (5). Fochus studied fieldstone hypothesis and state that when doctor faced with reduced their incomes because of increased the number of doctors, request for use of services increase via focus on deployment of present services (5). This research was following the



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amount of appropriating CT scan services during in Imam Reza therapeutic and educational center of Kermanshah in 2015.

**Materials and Method:** Present research is a descriptive-sectional research. The statistical community of this research composing all the 9078 file of patients who applied to Imam Reza therapeutic and educational center of Kermanshah since from 19/03/2015 to 09/03/2016 that use the CT scan services by the way of census. Questionnaire is the research tool that used to in order to study of patient file and extract of essential information for research. This questionnaire was composed type of CT scan and place of CT scan. all the type of accomplished CT scan in this research was studied that is composing five member of body with two type (without injection and with or without injection) and two cases related to other members of body (without injection and with injection). As well, we recorded the number of session that accomplish CT scan and normal or abnormal results separation by different member of body including brain, knee, hypo phis gland, basin, spinal member (neck, back and waist) and other case. After receiving and collect related information, according to designed questionnaire of normal or abnormal CT scan separation of appointment and reports. The intention of normal CT scan is that scans its results for patients was normal, and intention of abnormal CT scan, be unnatural of photography members. All the need information in this research collected from HIS system of hospital. Obtained data analyzed using SPSS 20 software for appointment relation between accomplished CT scan members and type of CT scan. To evaluate the finance and expense, we use the report of remedial assistance in 2014 that in this report final price of CT scan expenses separated by several members of body.

### Results

Considering to findings of research all the people who benefited from CT scan services during this time are 9078 cases, most prescription of CT scan is related to brain with 3260 cases, and least prescription of CT scan is related to spinal members including (spine, hypo phis and neck) with zero cases. Total number of normal CT scan was 3805 cases and abnormal CT scan was 5273 cases. (the purpose of normal is the member that photographed show any problem). Spinal member including (spine, hypo phis and neck) has least number of normal or abnormal CT scan with zero cases. Most of normal CT scan related to brain with 368 cases and Most of abnormal CT scan related to brain with 1839 cases. In addition the results show that amount of expenses of inappropriate cases related to 2015 is nearly 495246520. (table1). The result of Chi-square test show that there is a meaningful different between relations of patients who accomplished Lung, Brain, Lower and knee member, Spinal member, Womb, Womb and basin with together CT scan and type of CT scan; because calculated CHI-SQUARE,  $X^2 = 375.21$  DF = 6 was longer than Chi-square table with freedom degree of 6 and meaningful level of 01. (table2) In addition the results of Chi-square test show that there is meaningful ratio of patient who accomplished Lung, Brain, Lower and knee member, Spinal member, Womb, Womb and basin with together CT scan and type of CT scan (with or without injection) because calculated Chi-square,  $X^2=632.56$  DF=8 longer than Chi-square table with freedom degree of 8 and meaningful level of 0.01. (table3)



## **Conclusion**

The purpose of this research is appointment of amount of appropriate of accomplished CT scan services by the way of normal or abnormal of its results. In this research we don't accomplished similar research about CT scan, but it is done about MRI. The results of this research show that most prescription of CT scan is related to brain that is direction with the study of Hilja et al. in their research most prescription of MRI is related to loins member for the patient who have long lumbago (6). Most normal CT scan is related to womb and basin with together and most abnormal CT scan is related to brain. Hilja et al. in their research show that 7 percent of accomplished MRI in a school hospital was improper; so that 3 people of 30 MRI test of knee and 2 people of 30 MRI test of spinal member was improper (6). Sa'adat et al. access to this result in their research, among all the accomplished MRIs, 2.17 percent was unnecessary that is among 8.9 percent for headache to 8.4 percent for backache (7). Findings of Sadeghi Mazidi et al. research show that from all accomplished MRI, its 24 percent have normal result and its 76 percent have abnormal result (1). Probably difference in type of accomplished and unnecessary CT scan is because difference in statistical community of research and type of culture presented services and prescription, and based on patient request or doctor diagnosis. In some occasion behavior of doctor or present of specialized doctor in all expert knowledge in its center can be reason of interesting these services. We can reduce the unnecessary cases by taking exact biography and clinical inspection. The result of this research show that the amount of expenses of inappropriate cases related to 2015 is nearly 495246520 Rials imposed to remedy-healthy system that considering to shortage and importance of resource in health and remedy part should doing carefully, that is parallel with results of Sadeghi Mazidi et al. research in 2015, the result of their research show that the expense of inappropriate cases related to MRI services in mars 2014 estimate nearly 609180000 (1). Jonz et al. reach to this result that routine screening including physical inspection, ESR and radiography for appointment of vicious comparing with MRI, have 0.01 expense, and it is to amount of 625000\$ (8). The results of Valiola Saba research show that performance screening of lung cancer in our country caused to increasing the number of premature diagnosis will be amount of 0.0500 (9). The result of Nasri et al. research on 2014 show that the brain CT scan have most amount of abundance with 43.2 and most amount of expenses with 29.3 (2). the result of this research show that there is a meaningful different between ratio of patient who accomplished Lung, Brain, Lower and knee member, Spinal member, Womb, Womb and basin with together CT scan and type of CT scan ( normal or abnormal). That is necessary considering to necessity of doing early inspections in different member, you should notice to this subject from the view of general doctor and expert of radiology unit (10). The result of Khorasani et al. research on 2013 show that patient incorrect request from doctor, exceeding trust of patient to doctor, more tendency to use of more services of free and without deductible, lack of patient advice and free access of patient to doctors are the factors that caused to making induced demand (10). The result of Keivan Ara et al. research on 2014 show that the role of complementary insurance, lack of exact control on insurance, increasing the benefit, equipment companies, identical institute, pharmaceutical and marketing companies are the factors



that caused to making the induced demand (11). The result of Varharami Vida research on 2010 show that shut-in and flying services replace together and one change in population rate of doctor leading to change in use rate of shut-in attention toward to use of flying attention and it is possible to changing the pharmaceutical expense. So it is confirmed that the induced demand from doctors (5). The results of Abdoli and Varharami research on 2010 show that the number of prescriptive tests by the doctor and the time of meeting to his/her was influenced on patient sex and age, but about the unofficial doctor, the variables of prefer income to rest, experience and doing special services on increasing the number of prescriptive test and the time of meeting with doctor are effective (12). The results of Saberi et al. research on 2007 show that 6.8 percent of headache patients has abnormal CT scan (3). The results of Fakharian et al. research on 2007 show that the 1629 people (48 percent) of skull picture was normal from 87.8 percent, 400 patient (10.3 percent) doing the brain CT scan that 118 case of them was abnormal and bedridden expense of this patient was 316654 per night (13). The results of this research show that there is a meaningful different between the ratio of Lung, Brain, Lower and knee member, Spinal member, Womb, Womb and basin with together CT scan and type of CT scan (without injection and with or without injection) that possible because of culture of people, appointment of needs and pressure to doctors by patient followers and doctor's behavior. To preventing from increasing the use of this services, considering to excessive expenses on both patients and insurance, commanded that identified the effective factors in using improper and incorrect services and trying to eliminate of them by necessary training and present the replace encourager to doctors and personnel of photography unit.

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Table 1: abundance and percent of accomplished CT scan separated by different member of body and expense of inappropriate cases in mars 2015

17. Members	Type of CT scan injection	Numbers of accomplished CT scan	Numbers of normal CT scan	Numbers of abnormal CT scan	Expenses of inappropriate CT scan
lung	With injection	530	213	317	1635060640
	With or without injection	1587	465	1122	682265760
brain	With injection	30	7	23	4438840



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	With or without injection	3260	1421	1839	1026014880
Lower and knee member	With injection	0	0	0	0
	With or without injection	0	0	0	0
Spinal member (spine, hypothesis, neck)	With injection	0	0	0	0
	With or without injection	0	0	0	0
womb	With injection	621	79	542	300007840
	With or without injection	340	112	228	138642240
Womb and basin with together	With injection	1093	368	725	724130000
	With or without injection	791	323	468	441904320
total		8252	2988	5264	4952464520

\*the intention of with or without injection is concur use of this test; it means that cases need to injection, concur should test without injection of CT scan on that members.

Table2: result of Chi-square test and relationship between members of body and type of CT scan (normal or abnormal)

Members of body	Normal	Abnormal	Meaningful level
Lung	678	13439	
Brain	1428	1862	
Lower and knee member	0	0	0001
Spinal member	0	0	
Womb	191	770	
Womb and basin with together	691	1193	
$X^2 = 375.21$ DF = 6			



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Table3: the results of Chi-square test and relationship between members of body and type of CT scan (with or without injection)

Members of body	Normal	Abnormal	Meaningful level
Lung	530	1587	
Brain	30	3260	
Lower and knee member	0	0	0001
Spinal member (spine, hypo phis and neck)	0	0	
Womb	621	340	
Womb and basin with together	1093	791	
$\chi^2 = 632.56$ DF = 8			