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**QUALITY AND QUANTITY SURVEY OF HOSPITAL WASTEWATERS AND
PROVIDING FOR SOLVING PROBLEMS**

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ABSTRACT

Hospital wastewater, containing pathogenic micro-organisms, waste, laboratory and pharmaceutical intermediates for pharmaceutical compounds, radioactive elements and other chemical compounds, thus controlling the means of treatment and disposal of hospital waste water enjoys special importance. The present study aimed to assess the quality of wastewater disposal and treatment of private and public-sector 8 Hospital in Tehran. Wastewater treatment by activated sludge was studied hospitals. Sampling to determine the quantity and quality of waste water inlet and outlet, the inlet and outlet ducts Sewage treatment is carried out from November 1391 to May 1392. The results showed that the average rate in hospitals respectively 400-60 and bed 1000-400 L / d / bed1083 and L / d / bed 750, respectively. The discharge from the hospital in November (L / d / bed 1333) and the lowest discharge from hospital (L / d / bed 750), respectively. Average COD, BOD, PO₄, TSS and ABS respectively mg / l 52/52, mg / l 68/30, 59/4, 12/6 and 276/0 were recorded. Physical and chemical parameters of the environment in all cases except sub-standard BOD (mg / l 34) and COD (mg / l 72) in the hospital. Microbial parameters e. Coli and Total Coliform in all samples was below the standard of the environment and its level of output volume hospitals, D. and Medical Center, zero was measured. Based on the results obtained and the qualitative and quantitative effects of the environment on health, hospital waste management in particular attention pay to waste production, restoration, enhancement and improvement of wastewater treatment systems in hospitals is a necessity.

Keywords: Hospital, Sewer, Tehran, Quality, Quantity

INTRODUCTION

Statement of problem

Tehran, with over 13 million people, one of the largest cities in the world that is devoid of urban wastewater collection system. Waste, particularly industrial and hospital waste water are the largest sources of water pollution in Tehran. If the quantity and quality of these pollutants can be set to the disaster that is already taking place can be realized. Hospital waste, various microbes are always a part of them are pathogenic microbes. Untreated waste water to the environment and natural resources, whether on earth or those who are in the basement of the contamination of the source of the pathogen and human exposure to the risk of the spread of the disease among the people. Each has its own reasons and sources of pollution are important but pollution of hospital creates a hospital, Infection and infestation are released earlier in the hospitals as local people (the city) built-up after their pollution would be much closer to the people and the resources used to threaten them. However they also obtain quantitative and qualitative information for identifying the source of hospital waste to wander and waste collected from a source is a simpler. A growing need for inexpensive ways of treating water contaminated with industrial

waste and hospital waste its operators, procedures and maintenance of the equipment they need in the area of health centers and developing industries. To obtain qualitative and quantitative parameters can be recommended the cheapest and best way to treat hospital wastewater.

Research objectives:

1. Review the quantity of medical waste and compare with a standard.
2. Review the quality of medical waste and compare with a standard.
3. The optimal method to solve the problems of hospital waste.

Wastewater quality

Sewage contamination of water sources are important and necessary to the health of the collection, filtration and water circulation in nature back again. Waste containing pathogenic microorganisms, fats and detergents and organic materials and inorganic nitrogen and phosphorus are. Hospital waste contains large quantities of pathogenic microorganisms, dangerous chemicals and radioactive materials and organic materials and minerals. Municipal waste and medical waste due to their particular pathogenic microorganisms constantly depletes water resources are spread in the environment [2]. Hospital wastewater

mainly contains pathogenic microorganisms, organic substances, fats and detergents and disinfectants

Nuclear medicine centers are in hospital with a short half-life radioactive materials are used for the treatment and diagnosis result. Disease-causing organisms commonly found in wastewater are: cholera, jaundice, polio, typhoid, paratyphoid, tuberculosis, dysentery Basil, poisoning caused by Salmonella, Cestoda intestinal parasites, schistosomiasis, Leptospirosis dysentery, Borsloz, black measles, nematode worms, etc. [1].

Quantity of waste

The amount of waste generated in the hospital's research has been done but based on existing standards in different countries, the figures in this regard. It should be noted that many factors are involved in water consumption and per capita one of the factors must be obtained socially, culturally and economically separate from the figures for each country [3].

Hospital wastewater constituents

Biodegradable organic materials, minerals (dissolved, colloidal or suspended), toxic metals (mercury), and detergents (detergents), waste resulting from health centers will examine the following aspects:

A: bacteria, viruses, parasites,

(B) Dangerous chemical compounds, polymers, pharmaceutical compositions, the Isotope-radioactive

Overall quality and quantity of wastewater produced from the hospital to the number of hospital beds, the number of days of meetings, cultural and social status of the hospital, weather, health, hospital, hospital geographical situation whereby the number of clients, in hospital units, the existing research hospital, a hospital kitchen, the incinerator at the hospital, the location of infectious waste collection and laundry depends. Two important part of the hospital's role in the production of wastewater. Laundry and kitchen are very large volume of water consumed daily. Laundry detergents may be in addition to the use of disinfectants and other factors such as acid or alkali, easy to use way down the sewer. One of the heavy metals that are found in most hospital waste mercury in thermometers and other devices used. In terms of toxicity, hospital waste is highly dependent on the wards within the hospital, as the highest toxicity occurs when you are working in a hospital-being research laboratories [2].

Chemical and biological properties of medical waste

Identify microbes that are present in hospital waste, to determine their resistance to

antibiotics are (Leprat, 1998) microbial flora of about $10^3 \times 4/2$ per 100 ml (Emmanuel, 2001) to $10^5 \times 3$ per 100 ml (Leprat, 1998) have been reported for hospital waste. The concentration have been reported of less than 108 per 100 ml of the municipal sewer system by Metcalf and Eddy (1999).

Viral contamination of surface waters such as Escherichia viruses and other viruses have been reported. (Mansotte & Jestin, 2002) usually argue Nitro viruses are present in large amounts of waste. Their presence, as viral contamination of hospital waste water indicates the presence of other viruses. Apart from the virus, the virus HIV (the AIDS) was isolated from the secretions of patients with this disease. The liquid discharge directly through the sewers and general hospital laboratory to the municipal sewage system and finds a way to make a change in their physical and chemical processes in wastewater treatment is not created. Casson (1997) infected with HIV particles in raw sewage has been reported. Lue - Hing amount of viral agents between $10^2 \times 4/1$ to $10^1 \times 6/1$ per liter have been reported (in Chicago).

Hospitals are vast resources of chemical compounds in effluents with each of them can affect human health and the environment around him. In fact, some of this material has been found highly toxic waste And the

likelihood is that they cause cancer in the past decade has seen To study the toxicity and hazards associated with biological tests on genetic toxicity tests are released can be used [6]. Assess potential genetic toxicity tests using SOS and waste resulting from the medico-the concentration of Salmonella done. Samples obtained over a 6 week period between May 2001 and April 2003 was conducted. More than 388 samples were tested and 31 samples were positive [5].

Effect on hospital waste water treatment systems, sewage:

Effect on hospital waste water treatment systems, sewage:

Optimize the efficiency of the filtration process, requires the application of appropriate treatment is loaded. Accordingly, before entering hospital wastewater in municipal sewage treatment plants should be identified and specified pollutants what amount of pollutants discharged into the environment are authorized. Theoretically, there are two important parameters in the design of hospital structures are used, these parameters are: the input current to the load applied to the wastewater treatment plant (in). Increased load too determined to reduce the effectiveness and efficiency of the plant can be refined. Through the use of microbial

disinfection of medical-waste has a much lower loading than urban waste.

The ingredients bactericide may be bad effects on the efficiency of municipal wastewater treatment plants are operated. One of the things that are important in the synthesis of various pollutants entering the hospital, the compounds in the effluent find and may easily enter the environment and related ecosystems, Hospital waste water containing toxic and hazardous substances in the environment are with the evolution of organisms to their environment and associated ecosystems may be many changes [2].

Environmental problems caused by the direct discharge of hospital waste to the city sewage system:

One of the environmental problems caused by wastewater discharges to the same hospital into the municipal sewage system (without pretreatment), respectively. The hospital offers a range of compounds, including drugs and specific for therapeutic purposes, the detection and disinfection is used. In addition to the active compounds, materials, formulations and in some cases, pigments and dyes used as a pharmaceutical composition. Disinfectants, products are complex mixtures of active compounds. Some applications of these compounds, compositions containing the compounds wide secreted by the patient is

not metabolize these compounds in wastewater finds a way. After the application of disinfectants and their application in the desired location of these compounds may eventually reach sewage. A variety of compounds which are not biodegradable, through wastewater treatment plants may eventually reach sewage into surface waters.

One of the things that are important in the case of hospital wastewater treatment sludge as a fertilizer, which aggravate the remainder of contamination. Hospital waste water may contain chlorinated compounds or heavy metals such as mercury and silver content in the effluent COD was reported by 700 hospitals and 1,900 milligrams per liter respectively [2].

The compounds AOX (halogenated compounds) found in hospital waste water is relatively high. Mainly in the central part of them to a hospital in Chicago is 10 milligrams per liter. These compounds have good biodegradability and good absorption behavior also did not show the maximum mass of AOX from the hospital effluents Pages X - ray, solvents, disinfectants, cleaners and medicines is chlorinated. Studies on hospitals in Germany. Studies on hospitals in Germany have shown that concentrations of these compounds in the effluent of the hospital much more. Emmanuel in 2002

reported that the concentration of AOX compounds are located in the central hospital in France between 38/0 to 24/0 mg per liter. Usually the contribution of drugs in the hospital less than 11% of waste output of AOX compounds [2].

Standards are intended for hospital waste

Generally in most European countries following the mention of hospital wastewater treatment: the treatment is intended to be able to eliminate 95% of bacteria. Sludge, anaerobic digestion and egg creams in the end, less than 1 per liter of sample. Hazardous substances to be separated before treatment. Options for resolving the problem of sewage from a hospital. Hospital waste water discharges to municipal wastewater treatment plant. Hospitals may be clearance to do the following:

Treatment at the hospital, hospitals, especially those that are not connected to municipal sewage treatment plants, sewage treatment plants are forced to. Effective treatment of hospital wastewater should include the following steps:

1. Pre-treatment: Grain Bin, and the settling of the initial
2. Biological secondary treatment: more parasites and worms in the secondary sedimentation and sludge eggs are deposited. In this case, 90 to 95% of

bacteria and viruses from the environment-are removed.

3. Secondary treatment: sand filters, organic materials is less than 10 milligrams per liter.
4. Advanced treatment, secondary treatment effluent may contain at least 20 milligrams per liter of suspended organic matter is that the chlorine disinfection unit is high, resulting in a need of advanced treatment methods. This treatment may lagoon, fast or slow sand filtration to suspended organic matter is less than 10 milligrams per liter.
5. Disinfection with chlorine: To maximize the number of microorganisms on the number of microorganisms in natural waters acceptor sewage, industrial effluent treatment plant will have advanced to the break point chlorination this is possible through chlorine dioxide, sodium hypochlorite or chlorine done. Other advanced options ozone and ultraviolet light (UV).

Wastewater treatment sludge from the B-aerobic digestion may be. In this case it is better to have less than 1 per kg eggs, worms or be less than 1,000 fecal coliforms per 100 g of reach. The risk created by the discharge of

intestinal pathogens (bacteria, viruses, etc.) that simply finds a way to water [2].

Wastewater treatment processes used in the hospital

Used in hospital wastewater treatment processes are used depending on the characteristics of wastewater produced from a single pond aeration and sedimentation of large tractors biological and chemical change. The processes described above are the most activated sludge processes are used for wastewater treatment in hospital. In this case, using a sump, sewage collection, then pumped into the aeration basin-up. After the separation of sludge aeration and sedimentation flock composed of a single use. Other Tips and making use of these units use the minimum level [5].

Tehran hospitals in the country, particularly because of lack of space available, take advantage of advanced systems with all the equipment there, so most hospital administrators prefer to use package sewage. One of the important processes in wastewater treatment in hospital and has been used in some parts of the world, is a submerged membrane bio-reactors. In this way, by pumping sewage, is injected into the reactor and after crossing the dirt stuck to the inside of the reactor to be fine. Bacteria

attached to the membrane bio-organic compounds in wastewater and prescribe.

In general, it can be shown that using this method can be 80, 93, and 83% of COD, ammonia, and turbidity removal from hospital wastewater [2]. Most hospitals in Tehran in activated sludge wastewater treatment method is general. The plant operator or by the lack of expertise in the operation of the refinery, Some doors are locked during treatment suggest that this position is Wastewater treatment is still in placeare constructed between different classes is not the only place, But just to be fined by the EPA as a wastewater treatment facilities [1].

One of the important points in the treatment of medical waste, use less space to locate the reactors and components are refined. Most hospitals in the country, the available space for the installation of treatment is very small and therefore designers have turned to the construction of sewage treatment packages. If there is enough space can be natural treatment methods such as lagoons and constructed wetland for wastewater treatment in hospital use. One of the methods used in the treatment of waste in small areas takes the sequencing batch reactors. The reactors are operating in a way that they are fed at regular intervals or discharged wastewater.

Australian Synthetic Wetland with a sedimentation basin is used for wastewater treatment in hospital, bio disc is rotating. In this system by connecting the drive to the microorganisms in wastewater treatment is done. But in this case the problem is reduced biological oxygen transport layer is formed on a rotating disk. The report shows that the constructed wetland removal process can be effective in reducing nosocomial infections. One important thing in this case is properly insulated from the influence of the constructed wetland into the water. One of the major problems in the medical waste, there are numerous microorganisms. In wastewater treatment by activated sludge aeration process in the reactor would produce small bubbles. When these bubbles come from the bottom of the reactor effluent to surface areas, high levels of bacteria and viruses attached to them. Studies have shown that these bacteria and viruses simply find ways around the reactor and contamination of employees and workers of the plant are [4]. One of the important processes in wastewater treatment in hospital, chlorination is used. Chlorination of conventional methods to reduce and eliminate pathogens from the environment. Forms and various combinations of these compounds are used in water and wastewater treatment. In this method, due to the

contamination of the final effluent (output biological treatment units) used chlorine dose, contact time will be determined later.

Calcium hypochlorite powder refineries in Tehran is usually used for disinfection. A study on the removal of E - Coli and general phages were obtained from hospital wastewater, it was found that the residual chlorine Nash is important to remove these pathogens. It looks like chlorine residual of 5.0 milligrams per liter is an effective factor in the elimination of pathogens. Hospital wastewater treatment by adding chlorine concentration of 3.1 milligrams per liter and $4/3 - 2/3 = \text{pH}$, it has been found that by increasing the amount of COD, SS, N, pH 6.6, to reduce the chlorination result [2].

Radiology and radiography as well as other parts of the sewage waste into the waste stream. But the point is that there is not a waste of conventional radiography, like other parts and are classified as hazardous waste. This drains the last several different organs were collected and delivered to the IAEA, but now the work is not done. Low volume waste a lot of time, lack of adequate space at the IAEA not to perform specific operations on the type of sewage systems. These are among the most important of which is responsible for collecting the waste. After some time in the hospital, but the hospital depending on the

activity of the radioisotope uses what is the value of a day, inside the 20-liter barrels or collected with different dimensions and just kept it.

A review of the research conducted

In a study of Mr. Mokhtari December 2006 on the inlet and outlet of sewage treatment plants and 14 general and specialized hospitals in Tehran did Consider the quantity and quality of data and the design flow to certain hospitals were And 6 qualitative parameters such as TSS, PH., EC, TDS, COD measure Sampling at the moment and ink well and achieved significant results in terms of hospital waste. In another hospital and maternity Khatamolanbya Mr. Attalla Rakhsh Khorshid et al was done in 2005 years, and a maternity hospital wastewater treatment system efficiency Khatamolanbya Quds has been achieved in this case. Parameters BOD, COD, TSS in the samples studied and signed rank test was used to analyze and Vikakson Microbial indicators of fecal coliform in addition to the input and the output was measured. In the 2 treatment using conventional activated sludge aeration, despite significant (05/0 P <) changes wastewater BOD, COD and TSS was observed input and output.

In another study by Mr. Hartman and colleagues at hospitals in Germany in 2004

was examined the initial DNA damage and its relation to the concentration in the waste Siproflacine hospital in Germany. In this study it was observed that the initial DNA damage can a particular class of antibiotics is associated with Florokitolha and anti-biotic. Special care hospital in Korea by Mr. Zhyonk Wen Qin *et al.*, Enterococcus strains isolated in 2004 and sensitivity to antibiotics studied and their phenotypes were determined. The results showed that most were multi-drug resistant enterococci from E. Enterococcus.

METHODOLOGY

Research to identify the location of hospitals, hospitals Jam -Atiyh-Nov-national-bank-Imam Khomeini Medical Center Children were identified -Sadr and Dey Most of the hospitals are in a public hospital and the specialty and subspecialty. This study lasted about 6 months after the library studies, samples were collected from hospital after the results were presented transfer to the laboratory experiments were carried out at the end of last month, after analysis.

Since the sampling is done in the study of 2-one waste raw (input) and the Czech output, Thus, a sample of the hospital entrance where the wastewater collection and treatment plant flows, And a second sample of the output to where the wastewater into the environment, Should be. The number of samples in each

hospital has 2 sets of input and output as composite sampling was performed. After taking samples of both raw and treated wastewater parameters, COD, TSS, PH, fecal coliform and total coliform, phosphate, EC in raw wastewater samples were examined for all cases, raw sewage and treated wastewater were studied. In addition, each hospital wastewater flow were also performed measurements.

Method of measuring the rate of hospital waste

To obtain a wastewater discharge measurement 3 times, each time with the research community hospital discharge at 10, 15 and 20 were calculated as mean values were recorded after the third dose. The mean sum of the number obtained by dividing the average of the third quarter to an average of just mentioned. After calculating the rate of hospital treatment, the numbers obtained from various sources including the Water and Wastewater Technology, Environmental Engineering and Sanitation. Wastewater Engineering compared Treatment Disposal, Reuse and WHO standards.

The results of a survey of hospital waste

The results of the measurement of wastewater discharge outlet hospitals in **Table 1**, we see that the results are the average of the results obtained from the research community is to

measure the flow rate. After viewing the results in the table and compare it with the various authorities, the comparison chart capita research community with a range of different authorities such as books authored Water and Wastewater Technology Mark J, Hammer, Environmental Engineering and Sanitation authored book Solvate, book Wastewater Engineering Treatment Disposal, Reuse Metcalf and Eddy and WHO standard written note.

Check the quantity of waste from hospitals, we find that some hospitals do not conform to the standard Hammer and Metcalf and W.HO and other units are entirely consistent with the standards. Standard hammer: Hospitals future - Jam with refractory advanced CRC is outside the standard range. Standard Metcalf: November Jam hospital is out of range. Standard WHO: Hospitals future, medical center, jam, November, tops, D is outside the standard range.

Results from a qualitative measure of hospital waste:

Atiye Hospital wastewater results

According to the results presented in **Table 2**. It is evident that the future of private hospitals treated wastewater output in most cases correspond to the standard environment.

The results of a qualitative study of hospital wastewater

According to the results presented in **Table 3** is quite evident that the output of treated wastewater public hospital Imam in most cases correspond to the standard environment. But most of BOD and COD and EC standards.

Day hospital wastewater results

According to the results presented in **Table 4.** is quite evident that the private hospital wastewater output current in most cases correspond to the standard environment

The results of a qualitative study of hospital sewage National Bank:

According to the results presented in **Table 5.** It is evident that the output of treated wastewater State Hospital National Bank in most cases correspond to the standard environment.

The results of a qualitative study of hospital wastewater medical center:

According to the results presented in **Table 6.** It is evident that the output of treated wastewater Medical Center in most cases correspond to the standard environment.

Study of hospital wastewater Aban

According to the results presented in **Table 7.** It is evident that the output of treated wastewater private hospital November in most cases correspond to the standard environment.

The results of a qualitative study of hospital wastewater Jam

According to the results presented in **Table 7.** It is evident that the output of treated wastewater private hospital November in most cases correspond to the standard environment.

The results of a qualitative study of hospital wastewater Jam:

Table 8 The results of the analysis of physical, chemical, biological treatment of raw sewage and hospital Jam

Review of The results of Sadr hospital wastewater:

According to the results presented in **Table 9** is quite evident that the output of treated wastewater state hospital tops in most cases correspond to the standard environment.

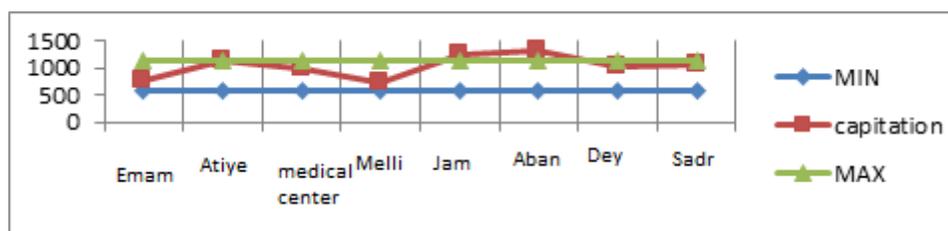


Figure 1: Comparison of per capita waste source Water and Wastewater Technology

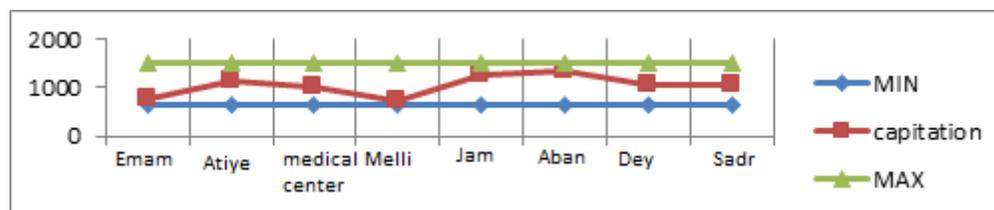


Figure 2: Comparison of per capita waste Source Environmental Engineering and Sanitation

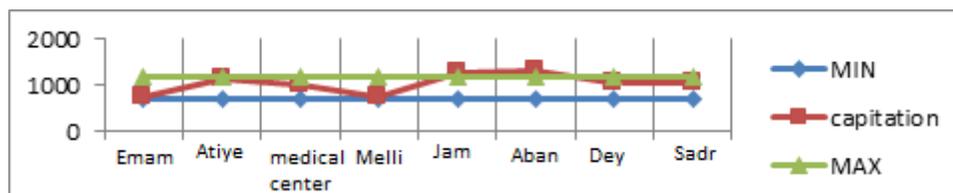


Figure 3: Comparison Source capita wastewater Engineering Treatment Disposal, Reuse

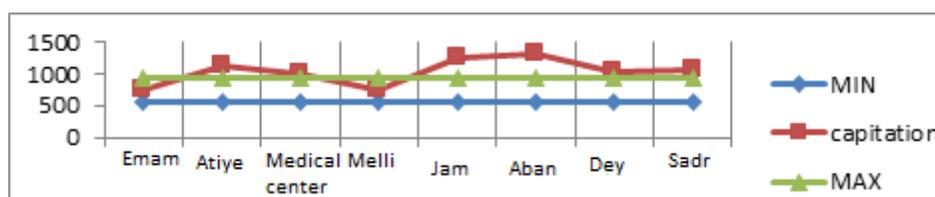


Figure 4: waste per capita compared with the WHO standard

Table 1: Comparison of discharge of wastewater treatment hospitals with various authorities

W.H.O	Wastewater Engineering Treatment Disposal , Reuse	Environmental Engineering and Sanitation	Water and Wastewater Technology	Per capita waste L/b/d	Dubai m ³ / d	Number of Beds	hospital
570 – 945 (L/b/d)	700 – 1200 (L/b/d)	662 – 1514 (L/b/d)	568 – 1136 (L/b/d)	750	750	1000	Emam
				1142	400	350	Atiye
				1000	300	300	Medical center
				746	200	268	Melli Bank
				1250	150	120	Jam
				1333	80	60	Aban
				1041	250	240	Dey
				1071	150	140	Sadr

Table 2: Analysis of physical, chemical, biological treatment of wastewater and future hospital

Environmental standard ppm			unit	Efficiency of omission (%)	Treated wastewater	Raw sewage	Row
Agriculture and irrigation	Drain on absorbent well	Surface water discharge					
6- 8/5	5- 9	6/5- 8/5	-	.....	7.52	7.45	PH
100	30 50 Moment	30 50 Moment	mg / L	84	28	168	BOD

200	60 100 Moment	60 100 Moment	$\frac{\text{mg}}{\text{L}}$	78	60	274	COD
100	—	40 60 Moment	$\frac{\text{mg}}{\text{L}}$	83	6	36	TSS
—	6	6	$\frac{\text{mg}}{\text{L}}$	44	4.88	8.79	PO₄
0/5	0/5	1/5	$\frac{\text{mg}}{\text{L}}$	98	0.36	20.56	ABS
400	400	400	$\frac{\text{MPN}}{100\text{mL}}$	99	3	6400	E.C
1000	1000	1000	$\frac{\text{MPN}}{100\text{mL}}$	99	13	11000	T.C
2250	....	....	$\frac{\mu\text{moh}}{\text{cm}}$	54	2860	1860	EC

Table 3: Analysis of physical, chemical, and biological treatment of wastewater from hospital

Environmental standard ppm			unit	Efficiency of omission (%)	Treated wastewater	Raw sewage	Row
Agriculture and irrigation	Drain on absorbent well	Surface water discharge					
6- 8/5	5- 9	6/5- 8/5	—	....	7.60	7.36	PH
100	30 50 Moment	30 50 Moment	$\frac{\text{mg}}{\text{L}}$	80.5	34	175	BOD
200	60 100 Moment	60 100 Moment	$\frac{\text{mg}}{\text{L}}$	74.2	72	280	COD
100	—	40 60 Moment	$\frac{\text{mg}}{\text{L}}$	76.2	10	42	TSS
—	6	6	$\frac{\text{mg}}{\text{L}}$	40	4.90	8.03	PO₄
0/5	0/5	1/5	$\frac{\text{mg}}{\text{L}}$	98.1	0.39	21.05	ABS
400	400	400	$\frac{\text{MPN}}{100\text{mL}}$	99.8	9	4600	E.C
1000	1000	1000	$\frac{\text{MPN}}{100\text{mL}}$	99.8	23	11000	T.C
2250	....	....	$\frac{\mu\text{moh}}{\text{cm}}$	45	2755	1900	EC

Table 4: Results of the analysis of physical, chemical, biological treatment of wastewater and the Hospital de

Environmental standard ppm			unit	Efficiency of omission (%)	Treated wastewater	Raw sewage	Row
Agriculture and irrigation	Drain on absorbent well	Surface water discharge					

6- 8/5	5- 9	6/5- 8/5	-	...	7.19	7.60	PH
100	30 50Moment	30 50Moment	$\frac{\text{mg}}{\text{L}}$	89.7	20	194	BOD
200	60 100 Moment	60 100 Moment	$\frac{\text{mg}}{\text{L}}$	84.3	50	320	COD
100	-	40 60 Moment	$\frac{\text{mg}}{\text{L}}$	90	3	30	TSS
-	6	6	$\frac{\text{mg}}{\text{L}}$	9.7	4.71	5.22	PO₄
0/5	0/5	1/5	$\frac{\text{mg}}{\text{L}}$	98.3	0.17	10.55	ABS
400	400	400	$\frac{\text{MPN}}{100\text{mL}}$	100	0	4600	E.C
1000	1000	1000	$\frac{\text{MPN}}{100\text{mL}}$	100	0	1100	T.C
2250	....	....	$\frac{\text{mpn}}{100\text{nl}}$	17.4	1550	1320	EC

Table 5: Analysis of physical, chemical, biological treatment of wastewater and the National Bank Hospital

Environmental standard ppm			unit	Efficiency of omission (%)	Treated wastewater	Raw sewage	Row
Agriculture and irrigation	Drain on absorbent well	Surface water discharge					
6- 8/5	5- 9	6/5- 8/5	-	....	7.23	7.42	PH
100	30 50 Moment	30 50 Moment	$\frac{\text{mg}}{\text{L}}$	87.2	28	220	BOD
200	60 100 Moment	60 100Moment	$\frac{\text{mg}}{\text{L}}$	82.7	60	347	COD
100	-	40 60 Moment	$\frac{\text{mg}}{\text{L}}$	92	4	50	TSS
-	6	6	$\frac{\text{mg}}{\text{L}}$	26.5	4.82	6.54	PO₄
0/5	0/5	1/5	$\frac{\text{mg}}{\text{L}}$	98.6	0.15	11.20	ABS
400	400	400	$\frac{\text{MPN}}{100\text{mL}}$	99.4	9	11000	E.C
1000	1000	1000	$\frac{\text{MPN}}{100\text{mL}}$	99.4	23	110000	T.C
2250	....	....	$\frac{\text{mpn}}{100\text{nl}}$	29.6	1456	1123	EC

Table 6: Presents the results of the analysis of physical, chemical, biological and refined from raw sewage Medical Center

Environmental standard ppm			unit	Efficiency of omission (%)	Treated wastewater	Raw sewage	Row
Agriculture and irrigation	Drain on absorbent well	Surface water discharge					
6- 8/5	5- 9	6/5- 8/5	-	....	7.20	7.35	PH
100	30 50 Moment	30 50 Moment	$\frac{\text{mg}}{\text{L}}$	87.5	30	240	BOD
200	60 100Moment	60 100Moment	$\frac{\text{mg}}{\text{L}}$	86.2	55	399	COD
100	—	40 60 Moment	$\frac{\text{mg}}{\text{L}}$	75	5	20	TSS
—	6	6	$\frac{\text{mg}}{\text{L}}$	43.2	1.39	2.45	PO₄
0/5	0/5	1/5	$\frac{\text{mg}}{\text{L}}$	98.2	0.22	12.26	ABS
400	400	400	$\frac{\text{MPN}}{100\text{mL}}$	100	0	11000	E.C
1000	1000	1000	$\frac{\text{MPN}}{100\text{mL}}$	100	0	110000	T.C
2250	....	....	$\frac{\text{mpn}}{100\text{nl}}$	10.3	1170	1060	EC

Table 7: Analysis of physical, chemical, biological treatment of raw sewage and Aban hospital

Environmental standard ppm			unit	Efficiency of omission (%)	Treated wastewater	Raw sewage	Row
Agriculture and irrigation	Drain on absorbent well	Surface water discharge					
6- 8/5	5- 9	6/5- 8/5	-	...	7.57	7.02	PH
100	30 50 Moment	30 50 Moment	$\frac{\text{mg}}{\text{L}}$	88.8	27	241	BOD
200	60 100Moment	60 100 Moment	$\frac{\text{mg}}{\text{L}}$	88.7	45	398	COD
100	—	40 60 Moment	$\frac{\text{mg}}{\text{L}}$	93.7	3	48	TSS
—	6	6	$\frac{\text{mg}}{\text{L}}$	56	4.36	9.89	PO₄
0/5	0/5	1/5	$\frac{\text{mg}}{\text{L}}$	88.8	0.27	11.66	ABS
400	400	400	$\frac{\text{MPN}}{100\text{mL}}$	97.8	240	11000	E.C

1000	1000	1000	$\frac{\text{MPN}}{100\text{mL}}$	99.5	460	110000	T.C
2250	....	....	$\frac{\text{mpn}}{100\text{nl}}$	24.5	1020	1352	EC

Table 8: The results of the analysis of physical, chemical, biological treatment of raw sewage and hospital Jam

Environmental standard ppm			unit	Efficiency of omission (%)	Treated wastewater	Raw sewage	Row
Agriculture and irrigation	Drain on absorbent well	Surface water discharge					
6- 8/5	5- 9	6/5- 8/5	-	...	7.35	7.13	PH
100	30 50 Moment	30 50 Moment	$\frac{\text{mg}}{\text{L}}$	94.1	15	256	BOD
200	60 Moment 100	60 Moment 100	$\frac{\text{mg}}{\text{L}}$	91.1	36	405	COD
100	-	40 60 Moment	$\frac{\text{mg}}{\text{L}}$	63.4	15	41	TSS
-	6	6	$\frac{\text{mg}}{\text{L}}$	33.1	7.23	10.82	PO ₄
0/5	0/5	1/5	$\frac{\text{mg}}{\text{L}}$	97.1	0.45	15.63	ABS
400	400	400	$\frac{\text{MPN}}{100\text{mL}}$	100	0	11000	E.C
1000	1000	1000	$\frac{\text{MPN}}{100\text{mL}}$	100	0	110000	T.C
2250	....	....	$\frac{\text{mpn}}{100\text{nl}}$	11.5	1066	956	EC

Table 9: ntaj analysis of physical, chemical, biological treatment of raw sewage and Sadr hospital

Environmental standard ppm			unit	Efficiency of omission (%)	Treated wastewater	Raw sewage	Row
Agriculture and irrigation	Drain on absorbent well	Surface water discharge					
6- 8/5	5- 9	6/5- 8/5	-	...	7.64	6.99	PH
100	30 50 Moment	30 50Moment	$\frac{\text{mg}}{\text{L}}$	93.8	17	275	BOD
200	60 100 Moment	60 100Moment	$\frac{\text{mg}}{\text{L}}$	91	40	445	COD

100	—	40 لحظهای 60	$\frac{\text{mg}}{\text{L}}$	95.5	3	68	TSS
—	6	6	$\frac{\text{mg}}{\text{L}}$	73.7	4.50	17.12	PO ₄
0/5	0/5	1/5	$\frac{\text{mg}}{\text{L}}$	98.5	0.20	13.26	ABS
400	400	400	$\frac{\text{MPN}}{100\text{mL}}$	76.1	1100	4600	E.C
1000	1000	1000	$\frac{\text{MPN}}{100\text{mL}}$	90	1100	11000	T.C
2250	....	....	$\frac{\text{mpn}}{100\text{nl}}$	41.6	980	1680	EC

CONCLUSION

The results of the survey of hospital waste in 8 hospitals in terms of quality and quantity as follows: Study showed that the average number of hospital waste wastewater flow to the small hospital bed capacity from 60 to 400 The rate of 1083 liters per day per bed and large hospitals of 750 beds from 400 to 1000 liters per day per flat. Lowest rate is also related to Imam Khomeini Hospital, 750 liters per bed per day, and most of the hospital November, 1333 liters per day per bed. The above results indicate that the hospital effluents for different parts of a plant and the choice of method of treatment in the hospital sector has a crucial role to And not just a bed capacity of the hospital determines. In other words, the intensity of which is directly related to the number of hospital sewage pollution. For example, the lowest of the

lowest parts of the hospital is a rip Imam Futureand yet most of the top most part of the hospital within a hospital-.COD BOD function as hospital wards. TSS parameter value is exactly the relation of subordination hospital passes and less expensive than hospital-be. Nutrient phosphate in wastewater due to fluctuations in the number of hospital beds and wards in a dramatic differences with one another. Since these materials are the interchangeable so it makes reaches similar levels of waste is almost identical.6. Above the rest is the detergent in the hospital. So it can be concluded that most of the other units in the unit of disinfectants used. Microbiological parameters in raw sewage are all higher than 2400. In hospitals where chlorination is used in the purification of this parameter would-be significantly lower. All hospitals treated wastewater into the

absorbent wells for irrigation of green areas of the hospital where they are. Because we are facing water shortages and the need to reuse it. Wastewater treatment sludge is generally all of the hospitals.

- Waste of radiology and radiography as previously mentioned, like other waste into the waste stream but the point is that there is not a waste of conventional radiography, like other parts and are considered hazardous waste. The waste already collected by various agencies and the International Atomic Energy Agency was delivered but has not done. To offer its own sewage Atomic Energy Organization of wells drilled in the same hospital and discharged. Some of the factors that are related to the lack of sewage radiography Listed below: short half-life waste from 3 days to 20 days the time it takes. Low volume waste too much time. The lack of adequate space at the IAEA. Failure to perform certain operations on the type of waste. These are in some cases more important is not to be responsible for collecting the waste. After some time in the hospital, but the hospital depending on the activity of the radioisotope uses what is the value of a day, 20 liter drums or other dimensions of the collected the pH is lower sterilization done better. BOD and COD concentration in the effluent BOD and COD

in waste water most clinical laboratories because of a series of tests specified residential quality characteristics during long-term sewage is laundry of powder detergents (bleach and other disinfectants) . The concentration of BOD and COD in wastewater effluents normal residential hospital laundry detergent because most chemical (sodium hydroxide and bleach) contain a lot of mercury. One of the most important parameters in biological wastewater treatment processes, pH and change it. Generally, the optimum pH for the growth and activity of bacteria in the range of is 5.6 to 5.8 and activity of bacteria in wastewater treatment is often disrupted or stopped at a pH greater than 5/9. EC Imam future hospital wastewater irrigation is not appropriate, but in other units if appropriate soil aggregation water quality is moderate. The density is higher organisms, a longer time is required for sterilization. Bacterial cells are destroyed quickly and easily. To provide chlorine contact time with sewage and wastewater to prevent the precipitation of very fine particles suspended in a chlorinated pool is made of a series of open canals

Recommendations and guidelines

Given that the number of quality parameters used in this thesis is therefore recommended to other quality parameters such as family

Sulfur as SO_2 , SO_3), chloride (Cl^-) and others will be investigated. In all hospitals and other buildings of the kitchen should be consuming fat to prevent grease from entering the plant to be constructed. It is better hospital treatment of RBC (rotating biological disc) is due to the following advantages: less noise pollution due to the use of blowers - Ability to develop resistance to shocks, quality and quantity of raw sewage, non-clogging and system downtime - high resistance to corrosion (Capability composite material).

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