

The advantages of the digital radio diagnostic devices implementation in m. Chisinau (Republic of Moldova) in 2009-2011 (first quarter)

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Abstrakt - Currently, in the medical-sanitary public institutions (MSPI) of the Republic Moldova, the weight of the traditional radio diagnosis of the devices, morally and physically overstep consist 90 – 91, 5%, inclusively their subordinated to municipality Chisinau - 97.7% (on 01.01.08).

Using of such devices in the m. Chisinau MSPI, essential diminished the quality of profile assistance, caused the commission of many errors in the diagnosis, and increased the radiation dose of population, etc.

In the order to improve the radio diagnosis, the m.Chisinau MSPI, during the years 2009-2010 were equipped with 10 digital radio diagnosis devices, which optimized the radiation protection and radiological safety of the population, improved the process of established imagistic diagnostic.

Key words - the devices for traditional radio diagnostic, the digital radio diagnostic, radiology improvement, the implementation advantages, the reduction of ionizing radiation level.

INTRODUCTION

Currently, the radio diagnostic (RD) service is one of the most requested services in the imagistic diagnosis of various diseases.

In context, the technical state of devices for radiology has the primordial importance.

Unfortunately, in recent years, the weight of the radiology devices morally and physically over fulfilled in Moldova reached 90-91, 5%. More serious situation was founded in the MSPI subordinate of the municipality Chisinau.

On date 01.01.2008 in the endowment of PMI of municipality Chisinau were 68 the traditional RD devices, of

which only two have the exploitation term until 10 years, the rest (97.7%) were morally and physically obsolete and all of 18 radiography devices had 100% wear.

At the same time, the modern technological progress has contributed to the appearance of digital technologies, including in health. X-ray, as component and important part (by its weight) of medical radio diagnostic, is the most simple and accessible method of detection of the many diseases. Recently have been elaborated and implemented the digital radiographic systems, which allow obtaining diagnostic images directly without intermediate segments, characteristic of traditional devices (analog) for RD. The scheme of

a system for obtaining direct digital radiology images is included in Figure 1.

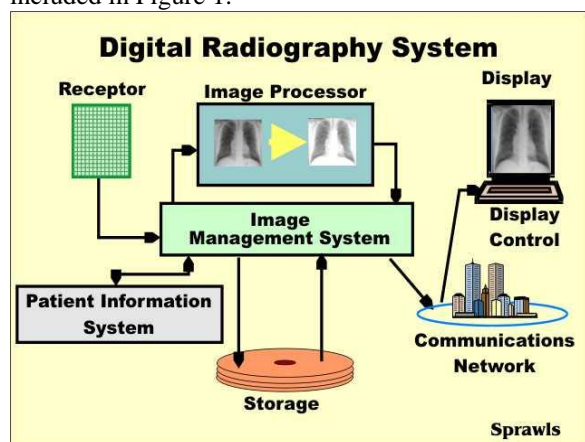


Fig. 1. The compartments of the directly digital radio diagnostic system.

The obtained image can be processed and displayed by the most various methods: on the compact optical disk carrying magnetic on recording a special device which can print an image on special film or paper. This image can be transmitted and at a distance to any MSPI with the service relationships by the systems DICOM, RIS and PACS.

In order to improve the process of establishment of imagistic diagnostic, the diminution of the ionizing radiation level for the population of the m. Chisinau, “The concept of radiological service modernization for the years 2008-2010”, have been elaborated, having as main objective the substitution of radiography devices with digital radio diagnostic devices (RDDD).

According of the precautions of this concept in 2008-2009 have been purchased and installed 5 x-ray devices with digital radio diagnostic devices (DDR) ALFA-09 (one in each TMA) and one Philips Duo Diagnost, procured with the centrally financing by the Ministry of Health. In 2010 year have been purchased and installed another 2 RDDD Unimat D-Rad, Philips Bucky Diagnost traditionally which has been digitized by the inclusion of a system iCR -3600 and Opera T - 90, mounted in an investment project.

Currently, thanks to these acquisitions in the MSPI of the m. Chisinau, from 82 RD devices operates only 11 devices with operating time of less than 10 years (including 10 digital), and the weight of the RD

devices morally and physically obsolete decreased until 86.5%. Simultaneous, the number of the radiography devices decreased with 33.3 % and consists 12 from 18 devices in 2008 year.

In 2011 is planned the substitution of another 6 of the radiography with digital devices, being created the conditions for complete substitution of morally and physically devices obsolete in the MSPI of the m. Chisinau. Currently, in Republic of Moldova 30 RDDD are functioned.

MATERIAL AND METHODS

The information from annual statistical form no.30 of the Ministry of Health MSPI, inclusively subordinated of the Municipal Council Chisinau Health Direction, have been used in this study on the base of documentary methods, statistics and the comparative analysis.

THE RESULTS AND DISCUSSION

In the result of substituting of the traditional digital RD devices in MSPI of the m. Chisinau during the period 2009 (March) –2011 (I quarter) 101 913 investigations and 114 225 procedures of the digital radio diagnostic have been conducted, the structure of which is included in Table 1.

The structure of digital X-ray investigations carry out in the m. Chisinau during the period 2009-2011 years (first quarter)

The laboratories of digital radio- - diagnostic	The number of investiga- - tions	The number of proce- - dures	The investigation of chest organs		The investigation of:	
			The preven- - tive purpose	Proce- - dures	The diagno- - stic purpose	Proce- - dures
CMFn.1 (XII.2010)	5484	5729	4149	1335	0	0
CMF nr.2 (III.2011)	2507	2802	2089	418	0	0
CMF nr.3 CCD Buiucani	32035	36935	27187	4848	0	0
CCD Centru	40268	43356	36192	4251	0	0
CMF nr.8	9011	12249	337	5187	2747	740
CMF nr.11	20855	21080	20401	454	0	0
SCMCnr.1 (XI.2010)	21655	23534	17923	1171	2343	218
	39	42	0	39	0	0
Total:	131854	145727	108278	17703	509	958

By RDD devices were made 17703 (14%) investigations of the chest organs for diagnostic from the total number of those investigations, 5090 (4%) investigation of motor system, and 958 (1%) investigations of various organs, mainly pare nasal sinuses. The number of procedures performed in the investigations mentioned is 145727.

The advantages of implementing digital radio diagnostic devices in MSPI of the m. Chisinau in 2009-2011 periods (first quarter) were:

1. The using of the mentioned system can display the images obtained immediately after the exposure which enables increased efficiency of the establishment of the diagnostic imaging process.
2. The RDDD allows the essential reducing of the time examination of the patient, of the number of people roentgen positive and reducing the number of the repeated examinations.
3. The release of three rooms (for the patient records, the archives and the obscure camera, used in traditional radiography investigations) and the reduction of the area room of the procedures until 16-20 m².
4. The reducing of the medical registrar function of the RDD laboratories, allowed to saves about 250 000 lei.
5. The saving of about one million lei at the account of not using the radio (photo) graphic film and of the chemical substances for its processing.
6. The creation of the electronics archive with the operative access at the information about the patient (radiological images newsletter) with the application of the embezzlement procedure of the coated image.
7. The optimized program of the activity RDD laboratories provide of the routine needs of primary health PMI.
8. The using digital radiography allows the reduction with 8-10 times the dose of ionizing radiation of patients and staff (attendants), contributing to reduce the number of induced cancers by ionizing radiation.

CONCLUSION

1. The continued use of traditional technologies in medical radio diagnostic is costly, do not permit respecting of the radiation protection rules and radiology safety of the population and medical personnel, etc.
2. The implementation of new digital technologies in medical radio diagnostic has a series of the advantages: the activity efficiency, saving of the financial resources, of the

spaces to locate of the new devices, radiation safety and radiation protection of the patients and personnel.

3. Using the RDD devices improves critical the quality of the radiology diagnostic considerably reduces the possible cases of human error and optimize the process of diagnosis.
4. The implementation of digital technology during the years 2009-2011 (first quarter) allowed the reducing of the collective dose of population radiation of the municipality Chisinau.

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