

**CASE STUDY****Hepatology Center for the Management of Patients with Hepatitis:  
Proposed Electronic Health Record****Anna Tsakona, RN, MSc, PhD (c)**

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**Abstract**

**Introduction** The operation of the hepatology center is based on the use of a patient's health record. It is a printed record that the physician prepares and fills in at every visit of the patient, keeping in good order all information related to the patient's health problems and which concern mainly the liver problem. The way the printed record is kept and managed is a procedure that requires optimum organization, order and effort on the part of the medical personnel. In these efforts, ways to facilitate the procedure could be sought by using the new information and communication technologies.

**The aim** of this paper is to depict the actual status and conditions under which the hepatology center of the PPGNP (University Regional General Hospital of Patras) currently operates. To identify the level of technological dissemination and to underline the benefits that the practice of medicine gains. Moreover, it aims at identifying the problems that doctors encounter in their attempt to organize their work and how the adoption of bioinformatics tools can prove helpful.

**Conclusions** This paper underlines the need to adopt the EHR and modern technologies that bioinformatics offers at all levels of practicing the medical profession in the Greek hospitals. Actually, taking into account the specialized needs of each department and each user, we shall only remain limited to the simple use of a computer or an EHR program, but we shall make all possible efforts to seek for those technologies that will bring a real change in the way we work and will yield the maximum benefits possible.

**Keywords:** Hepatitis, Hepatology center, Health record, EHR, meta-EHR**Introduction**

An electronic health record (EHR) is defined as a repository of information regarding the health of a subject of care, in computer processable form. (Blumenthal et al., 2006) Electronic health records systems can provide additional functionality, such as interactive alerts to clinicians, interactive flow sheets, and tailored

order sets, all of which cannot be done with paper-based systems. (National Institutes of Health, National Center for Research Resources, <http://www.ncrr.nih.gov/publications/informatics/ehr.pdf>). These systems encode a wide array of clinical data including patient demographics, current and prior diagnoses, medication prescriptions, laboratory results, radiology

images, personal stats like age and weight, and billing information (Klompas et al., 2008).

Integrity of EHRs is important in order to achieve gains in quality and cost reduction. Any changes or inaccuracy in data can have an impact on the healthcare process. Health information needs to be readily available to the authorized person at the time when it is required. (Win, 2005)

Electronic Health Information Systems could decrease medical errors, enhance preventive care, facilitate communication between doctors and patients and among medical team members and reduce health disparities. (Hoffman, Podgurski, 2008)

The primary advantages of electronic health records include:

- Increased efficiency: Patient information is readily available, saving time and effort while reducing the need to store paper records and files.
- Improved documentation: Eliminates illegible handwriting, links related records electronically, reduces data entry errors, and helps eliminate missing/required patient information.
- Improved quality of care: Clinicians can easily access records, and simple tools can be incorporated to warn of potential problems such as incompatible drugs. Physicians or nurses can check on the outcomes of individuals or groups of patients and perform research studies. (Fraser et al., 2005)
- Improved security: Both in the USA and in the EU, several directives protect the processing and free movement of personal data, for purposes of health care, and set guidelines that all healthcare organizations will have to comply with in regards to electronic health transactions. (Digital Preservation Europe, [http://www.digitalpreservationeurope.eu/publications/briefs/security\\_aspects.pdf](http://www.digitalpreservationeurope.eu/publications/briefs/security_aspects.pdf))
- Reduced expenses: Eliminates need for most transcription activity and dramatically reduces the need for paper storage facilities. Having in mind that computerization may yield cost and efficiency gains, but only at the most advanced stage. (Himmelstein, Wright, Woolhandler, 2009)
- Likelihood of reduced malpractice insurance premiums: In some cases, malpractice insurance carriers will reduce malpractice premiums when EHR software is being

used. (Advanced Data Systems Corp. [http://www.adsc.com/ehr\\_docassistant.asp](http://www.adsc.com/ehr_docassistant.asp))

### Case study

The current status of the hepatology center of the Regional University General Hospital of Patras (RUGHoP).

The Hepatology center of the RUGHoP operates at the hospital's outpatient department, in accordance with the operation rules of the said clinic, from 09:00am to 14:00pm. The personnel consists of 4 specialized doctors, supported by the nursing staff of the outpatient's department. This center manages diseases related to the liver, such as acute and chronic viral hepatitis and mainly hepatitis A, B, C, D and E and also alcoholic and non-alcoholic hepatitis, autoimmune hepatitis, cirrhosis and hepatocellular carcinoma. The center is tightly linked and collaborates with the departments of oncology, general surgery and diagnostic and imaging tests in order to provide a multi-dimensional and customized diagnostic and treatment route.

Patients visit the center upon appointment that they arrange on the phone and they usually bring with them the results of some initial tests they have done. When patients visit the center, their record is located, given one had been prepared in a previous visit, or a new printed Health Record is prepared. This record includes a set series of forms that include information on the patient's health condition. These forms are: the patient's full medical history, the brief history and another form that includes all most recent lab results.

The first form, meaning the patient's full medical history, is filled in only at the first visit of the patient to the hepatology center and includes a large volume of information on 4 pages – parts, starting with simple demographic details to include the findings of a physical examination or instructions for medication and tests (as shown in photos 1-4).

More specifically, the first part of the form consists of seven different sections-boxes. The first box entitled “patient's details” is filled in with demographic details such as surname, name, age, phone number, residence address and date of examination. The second and third boxes entitled “reasons for visiting” and “current disease” includes information regarding the first symptoms that the patient manifested and what is the primary disease respectively.

**ΣΤΟΙΧΕΙΑ ΑΙΘΗΝΟΥΣ:** ΗΛΙΚΙΑ 59

ΕΠΩΝΥΜΟ: ΟΔΟΣ ΑΡ. ΠΟΛΗΧΩΡΙΚΗΣ ΚΑΤΑΓΩΓΗ ΤΑΜΕΙΟ

ΟΝΟΜΑ: ΠΑΤΡΩΝΥΜΟ: ΑΙΤΙΑ ΠΡΟΣΒΛΕΥΣΗΣ:

Παρουσία νοσίων: Προσβολή για ελμινθόσπορα και οξεία ηπατίτιδα και άλλες επί οπππ.

**ΑΝΑΣΚΟΠΗΣΗ ΣΥΣΤΗΜΑΤΩΝ**

Καρδιά —	Ικτερός —
Αλλογή ΣΒ —	Οόρα —
Ασπέρση —	Χόληρα —
Διαφάνη —	Αιμοραγία —
Ευκατα —	Οίδημα —
Κού. πόνος —	Κνησμός —
Πυρετός —	Sex - ήπια —
Υπνος —	Διαταραχές εμψίνου ρήσης —
	Διαν. Διαταραχές —

**ΣΥΝΗΘΕΙΣ**

Αλκοόλ — Μην επί κινής. Ταβία —

Κάπνισμα — 1 pack/day. Άλλες —

**ΚΛΗΡΟΝΟΜΙΚΟΤΗΤ**

**ΑΝΑΜΗΝΗΤΙΚΟ**

Ιστορικό επί άλλων νοσίων —

Χρόν. επιπλοκές συμφορητικής καρδιάς —

Μεταστάσεις οξείας ηπατίτιδας —

Ευθυμικός —

Αυτοάνοσο τ.σ. —

Φάρμακα οξείας —

1 Full History Form Part I

**ΦΥΣΙΚΗ ΚΑΤΑΣΤΑΣΗ**

Βάρος 68. Υψος — Αναπνοές —

**ΓΕΝΙΚΑ**

ΑΠ — Οψη καλή. Θέρση καλή. Ενυδάτωση καλή.

**ΔΕΡΜΑ**

Μελαχρωση οξεία — Ικτερός — Παλάμες —

Ουχρότης — Ευρωαγγείες — Ουρρυθρία —

Κυάνωση — Εκχυμώσεις — Νόχια —

**ΑΔΕΙΕΣ**

Λεμφαδένες — Παρωτίδες —

Θυρεοειδής — Μαστοί — Ορχείς —

**ΟΡΓΑΝΑ**

Δάπνοια —

Επικρουση — Ψηλάφηση —

Ακρόαση —

**ΚΑΡΔΙΑ**

Τόνοι S2 ελαφρώς — Σφαιγίτιδες —

Ψιθυμια — Οίδημα —

**ΚΟΙΜΙΑ**

Επίπλεθος — Κήλες — Ασκιτής —

Ακρόαση —

Ηπαρ μεγετωμένο — Χοληδόχος κύστη (ΕΛΑ) —

Χοληδόχος κύστη — Σπλήνας ελαφρώς — Μάζες —

Νεφροί — Δ. ορθού —

**ΝΕΥΡΙΚΟ**

Τρόμος υποκειμενικός — Τενόντια —

Αρθρώσεις — Λιωθητικότητα —

**ΣΚΕΛΕΤΙΚΟ**

Αρθρώσεις —

Μύες —

2 Full History Form Part II

**ΕΡΓΑΣΤΗΡΙΑΚΟΣ ΕΛΕΓΧΟΣ** 31/12/12 → 11/1/13

Hct 37% → 34%	Χοληρυθρίνη 7 → 6,08	K 4,3
Λευκά 7000 → 7700	SGOT 37 → 4,48	Na 140
Π 65 → 64	SGPT 400 → 155	Ca —
Λ 23 → 25	ALP 1150 → 123	Σάκχαρο 96 → 96
M 3 → 1	ΥGT 127 → 58	Ουρία 17 → 30
H 9 → 11	Λευκάματα 6,6 → 7	Κρεατινίνη 0,6
AMPI 10000 → 12000	Αλβουμίνη 3,6 → 3,7	Ουρικό —
Μορφή —	a1 —	Χοληστερίνη —
PT 12,8 → 12,6	a2 —	Τριγλυκερίδια —
PTT 36 → 40	8 —	Αμυλάση —
ΤΚΕ 7 → 14	Y —	Na ούρων —
		Αιμωμία —

**4/1/13 → 10/3/13**

ABSAg (+) → (+) anti HBS (-) → (-)	SMA —	aFP —
HBSAg (-) → (-) anti HBS (+) → (+)	ANA —	CEA —
anti HBe IgG (+) → (+) IgM (-) → (-)	AMA —	Fe —
anti HDV (+) → (+)	LKM —	TIBC —
anti HCV ΔE → (-)	C3 —	Φερίτινη —
anti HAV IgG —	C4 —	B12 —
HBV - DNA —	IgM —	Φυλλικό —
PCR —	IgG —	Cu ορού/ούρων —
RIBA - HCV —	IgA —	Σερούλασμινη —
EBV —	IgE —	a1 - αντιθρυψίνη —
CMV —		

Αέρια αίματος: pH — pO2 — pCO2 — HCO3 — SAT —

Γενική ούρων: —

Ασπτικό υγρό: γενική: —

Rb φάρμακο: Καλλιέργεια: — Κυτταρολογική: —

Με: 5/1/13: μικρή αύξηση ήπιος, οξεία χημικός έλεγχος κίβωτο αίμα και διαταχή χημειοστατών

07.5/1/13 (και καλή αιμοχρωματώδη) = Η διάγνωση αποδίδεται σε φούρο παραγόμενη

08.5/1/13 (και καλή αιμοχρωματώδη) = Η διάγνωση αποδίδεται σε φούρο παραγόμενη

Ενδοσκόπηση/ΒΓ: 12/1/12: καλή

Χολοκυστοσκόπηση/Β.Υ.: —

Βιοψία: —

3 Full History Form Part III

**ΠΛΑΝΟ**

**ΣΕΡΑΦΕΙΑ:**

**ΣΚΕΨΕΙΣ:** Υπεροχρωματώδης ΗΕΑ και θρομβωτική πυλαία β. ιερούς → διαταραχές στο ηπαρ σε κίβωτο αίμα

**ΕΠΟΜΕΝΗ ΕΠΙΣΚΕΨΗ:** 30/10/13

**ΠΡΟΓΡΑΜΜΑΤΙΣΜΟΣ ΕΞΕΤΑΣΕΩΝ:**

→ Πηλακοσκόπηση + ΥΕΑ CT αυ

Βακτηριολογική εξέταση

Νεκρική: Οκ. → αιμοσφαιρίνη

Τυποσφαιρίνη

Προσεχέδη 1/2 Lasix

4 Full History Form Part IV

The fourth box, entitled “review of systems” concerns the potential signs and symptoms that the patient manifested regarding the several systems, such as weakness, change in body weight, anorexia, nutrition, vomiting, abdominal pain, fever, sleepiness, jaundice, urine, feces, bleeding, oedema, itching, sex-libido, menstrual cycle disorders, mental disorders.

The fifth box entitled “habits” includes the consumption of alcohol, smoking and traveling. The sixth field is entitled “heredity” and any hereditary diseases are entered there. The seventh field is entitled “anamnesis” and includes known elements such as hepatitis, jaundice, blood transfusions, vaccinations, surgical operations, thromboses, autoimmune diseases, medications.

The second part consists of eight fields, where the results of the physical examination are entered. The first field is entitled “general” and includes all details of the patient’s physical examination, such as blood pressure, pulses, temperature, general appearance, moisture, weight, height, breathing. Fields 2 to 8 include the doctor’s findings regarding each part of the body separately, such as skin, glands, chest, heart, abdomen, nervous system and joints.

In the third part of the form are entered the results of the lab tests, in three separate boxes; one for viral, one for serum and one for biochemical tests. Moreover, the following are entered: blood gases, ascetic fluid and imaging test results such as: chest x-ray, ultrasound, CT scan, liver-spleen scanning, endoscopy, colonoscopy and finally the biopsy.

The fourth part of the form has two fields, the first one entitled “conclusions” and where the conclusions from all the above are entered; and the second one entitled “plan”, which includes treatment, considerations, next test and the schedule for the tests to be performed.

Filling in this 5-page long form by hand leaves room for inaccuracies and omissions that could affect the decision-making on the part of the doctor. Even the tracking and reading of such a form included in a record, as also of those mentioned below, require time that the doctor shall spend, thus missing it from the time spent treating the patient. Finally, further usage of the content by using an EHR system becomes unfavorable. It requires systemic effort in order to copy the content, which apart from the large work volume it creates, it is also likely that errors are made during typing, or even misinterpretations, especially when people

undertaking the typing are not doctors, thus are unfamiliar with the patient’s condition.

The second form used is the patient’s brief history (photo 5). It is a form filled in at every visit that the patient pays to the center and the aim is to reassess the patient’s health condition and enter the new details and changes that have occurred according to the doctor’s updated assessment. So, this form includes all general details, such as surname, name, age and date of visit, the main complaints of the patient, a brief history and the findings of the physical examination, the treatment plan, the means on which the diagnosis and treatment of the patient are based and finally the date for the next follow-up visit.

It becomes obvious that in the course of time, the said form is repeated many times in the patient’s health record and its proper classification is vital. Since the doctor shall look for the most recently filled in form so as to have available the most updated and the full picture of the patient’s health condition. The same problems as in the form of the full history can be an issue here as well, meaning errors, inaccuracies, misinterpretations and omissions that arise from the fact that information is entered by hand.

A third form used concerns the lab tests (photo 6) where all values of the lab tests that the patient undergoes are entered in columns by date. More specifically it includes the blood tests, the biochemical and urine tests. This form does not fully cover the doctor’s needs, since there is no space provided for all possible tests, while their filling in by hand poses problems, since the accuracy of the data can be easily be doubted during copying or there may be misinterpretations due to the handwriting of a doctor.

In all cases, the doctor does not use this form solely, but in combination with the test form issued by the laboratory and compares the values mentioned in order to make a decision. A significant element that the use of this form underlines is that the doctor needs to see not only the most recent test results, but a series of tests that the patient has undergone in the entire course of his disease.

Apart from the above, the patient’s record includes a series of imaging and other tests (photos 7-10) that the patient undergoes upon referral of his attending doctor. Such tests are performed either at the hospital or the patient brings them with him from external private labs.

ΕΠΑΝΕΚΤΙΜΗΣΗ ΑΣΘΕΝΟΥΣ

ΣΤΟΙΧΕΙΑ ΑΣΘΕΝΟΥΣ: ΕΠΩΝΥΜΟ ΟΝΟΜΑ ΗΜΕΡΟΜΗΝΙΑ 25/9/1995 A.M.

ΠΡΟΒΛΗΜΑΤΑ:

1. ΧΕΗ HBS Ag(+), anti-HBe(+), anti-D(+)
2. Δυσία με INF εν έμφυτο, έως Νοεμβρίου 94.
- 3.

ΣΥΝΤΟΜΟ ΙΣΤΟΡΙΚΟ - ΦΥΣΙΚΗ ΕΞΕΤΑΣΗ

Υποκαρδιακή αναφορά "τμήματα" στο διατομό υδριού είναι προσανατολισμένα να επηρεάσει βάρος κτμ και καρδιακή. Αυτά είναι το τελευταίο τρίτο που αφορά στην σε οικογενή. 2. Β. 6. 2. 2. 2.

Ήπιος 13,5 cm. Σηγήν. ΑΠ= 105/80 mmHg

Ενδεικτική των φροντισμάτων των Σεπτεμβρίου 95.

Ο ίδιος αναφέρει φωνοκαρδιακές τραυματικές σε 1995 (εκτός Σεπτεμβρίου) που όμως δεν τα βρήκα στο ιστορικό.

↓  
- ΥΠΟΦΡΩΝ

(ΑΕ-ΠΘ) ΑΕ Thyroid Peroxidase 230 u/ml (20) 13/9/1995  
(TRG) 47,8 mg/ml;

ΠΛΑΝΟ

ΔΙΑΓΝΩΣΤΙΚΑ: Δίδωμο ορολογικών ελέγχων και HBV-DNA  
Νέα βιοψία ήπατος; Σπανόκαρπη IFN;

ΘΕΡΑΠΕΥΤΙΚΑ: Ουδέν

ΕΠΟΜΕΝΗ ΕΞΕΤΑΣΗ 16/10/95

ΔΙΑΤΡΩΣ

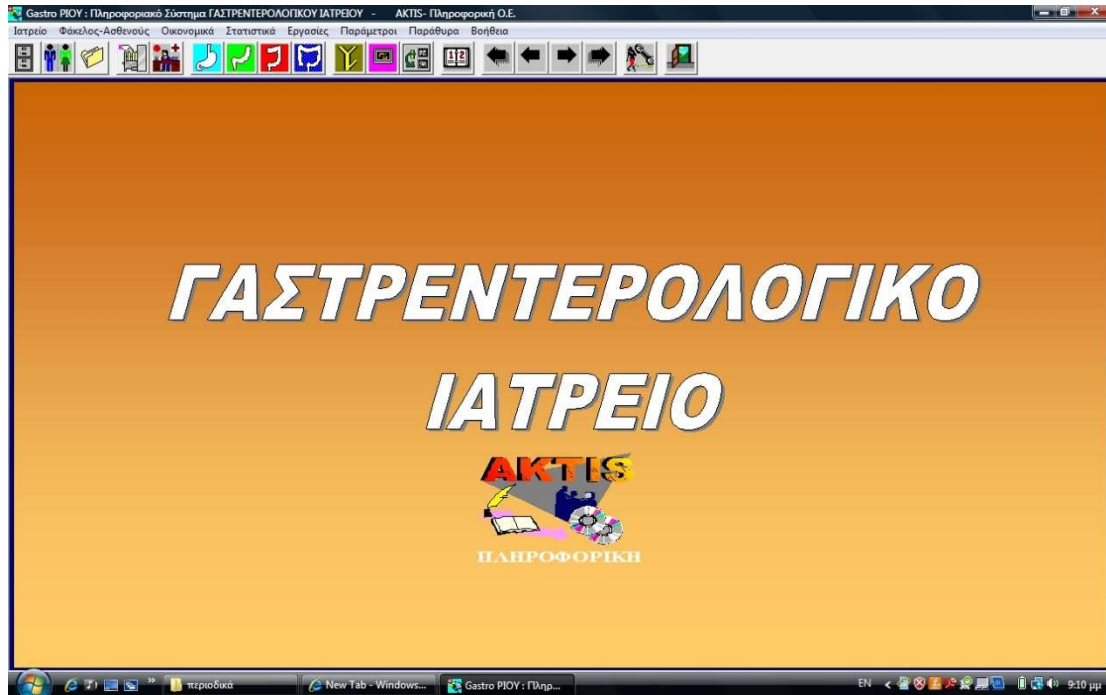
5 Brief History Form

ΕΡΓΑΣΤΗΡΙΑΚΕΣ ΕΞΕΤΑΣΕΙΣ

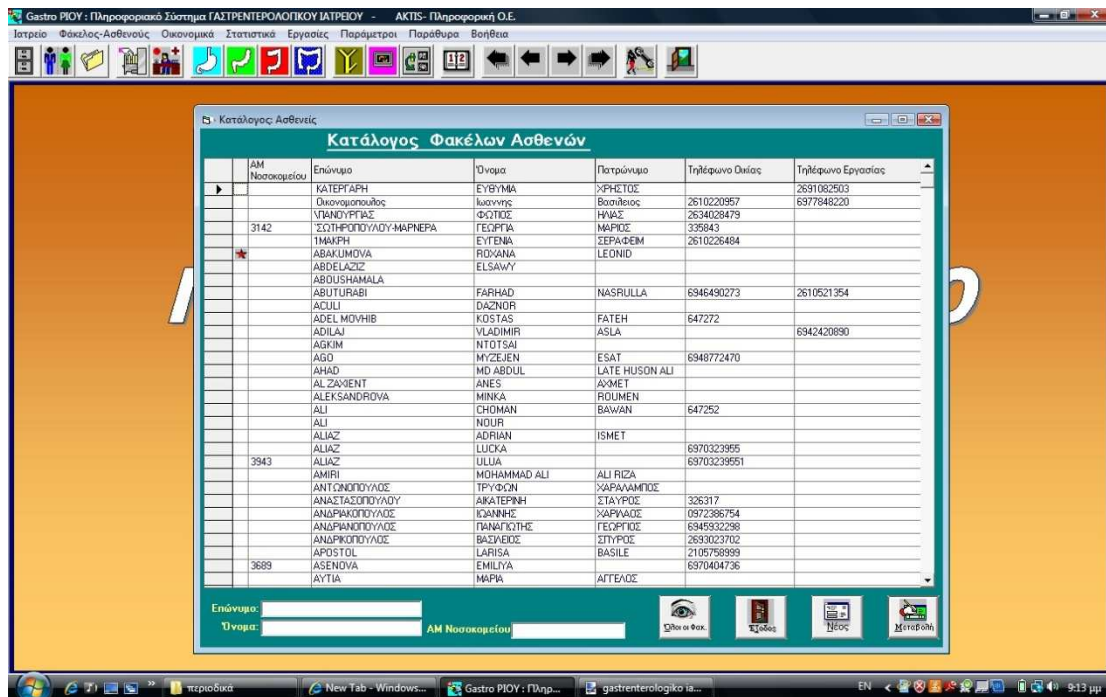
ΟΝΟΜΑΤΕΠΩΝΥΜΟ	ΑΣΘΕΝΟΥΣ	18/10/95	22-5-95	2/8/95	8/9	2/11/95	4/2	22/10/95	22/10/95	22/10/95
ΗΜΕΡΟΜΗΝΙΑ	95	18/10/95	22-5-95	2/8/95	8/9	2/11/95	4/2	22/10/95	22/10/95	22/10/95
Αιματοκρίτης		42,5	42,5	41,5	40,4	41,4	39,5	42,8	42,8	42,8
Αιμοσφαιρίνη		10	10	14,1	14,8	13,4	13,2	14,2	14,2	14,2
Αιμοπεταλία		37.000	49.000	100.000	180.000	220.000	210.000	210.000	210.000	210.000
Λευκά		6.800	7.800	6.800	8.500	8.600	8.100	7.600	7.600	7.600
PL		5,6	5,6	6,2	5,1	6,3	6,2	5,6	5,6	5,6
Λ.		38	37	31	44	32	31	39	39	39
Μ.		5	6	3	4	1	5	4	4	4
Η.		1	1	1	1	1	2	1	1	1
ΤΚΕ										
PT		12,8	14,2	14,1						
PTT										
Σάκχαρο		118	139	135	108	150	109	146	205	163
Ουρία										
Κρεατινίνη										
Ουρικά					4,3	3,6	3,1			
Χοληστερίνη		239	245	247	255	224	202	246	246	246
Τριγλυκερίδια		115	205	228	124	157	111	235	260	224
Χοληστερόλη		0,9	0,9	0,9	0,9	1,22				
ALT		22	18	32	44	47	28	52	49	40
AST		25	17	30	40	51	50	48	42	36
YGT										
ALP		131	122	138	122	128	128	194	179	181
LDH										
Λευκώματα		6,76	6,89	6,8	6,18	7,2	6,25	5,6	4,6	
Αλβουμίνη		4,28	4,25	4,2	4,6	4,4	4,2	4,2	4,2	
α <sub>1</sub>										
α <sub>2</sub>										
β										
γ										
AFP										
K										
Na										
Ca										
Αμιλάση Ορού										
Αμιλάση Ούριου										
Γενική ούρων										
Fe										
TIBC										
Φερίτιν										
ΑΔΑ 1/200										
ΑΔΑ										
ΑΔΑ 1/20										
ΑΔΑ										

6 Lab Tests Form

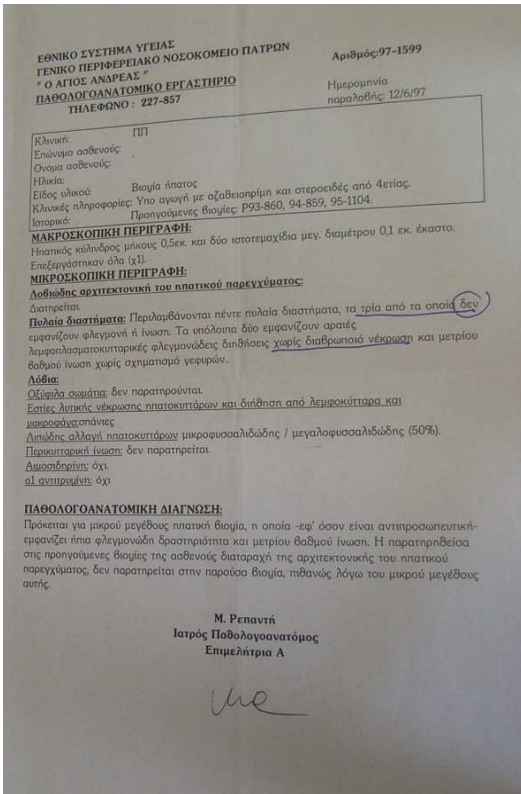




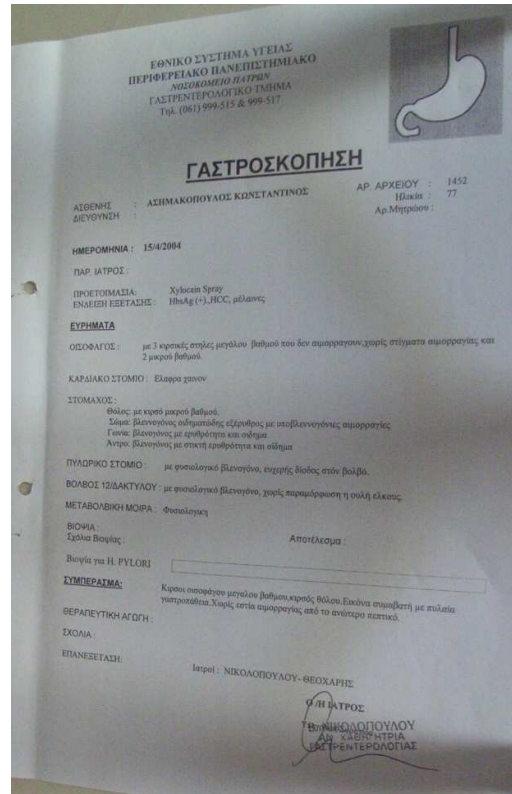
11 Existing Electronic Health Record Software



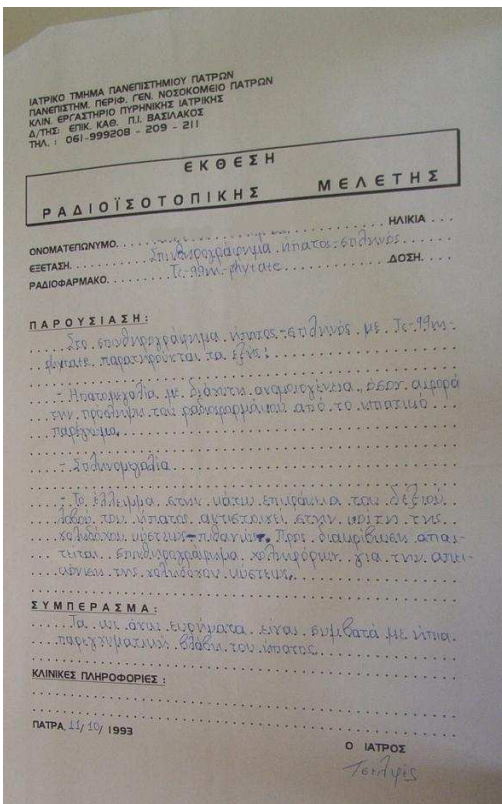
12 EHR Software -List of patients' records



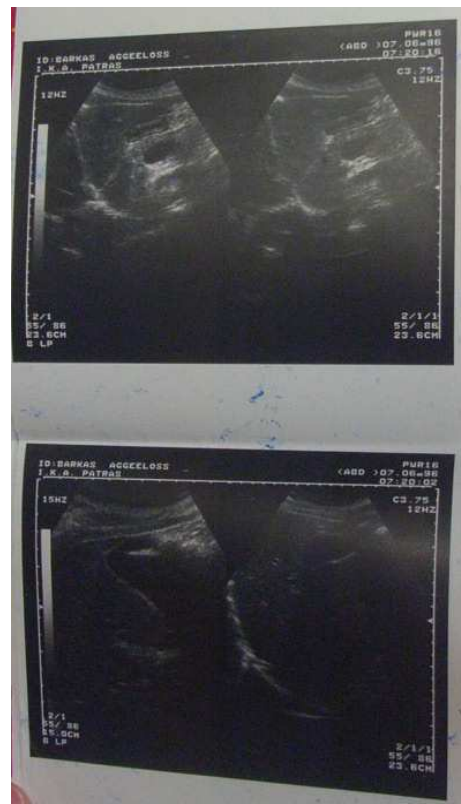
7 Imaging Tests – Liver biopsy



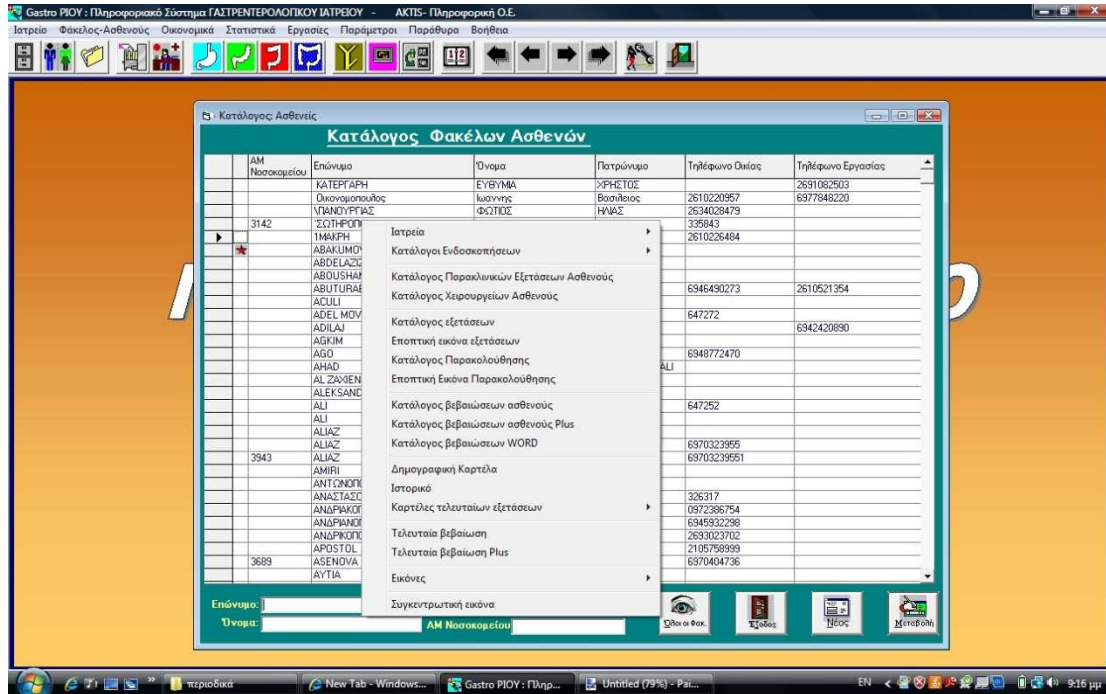
8 Imaging Tests gastroscopy



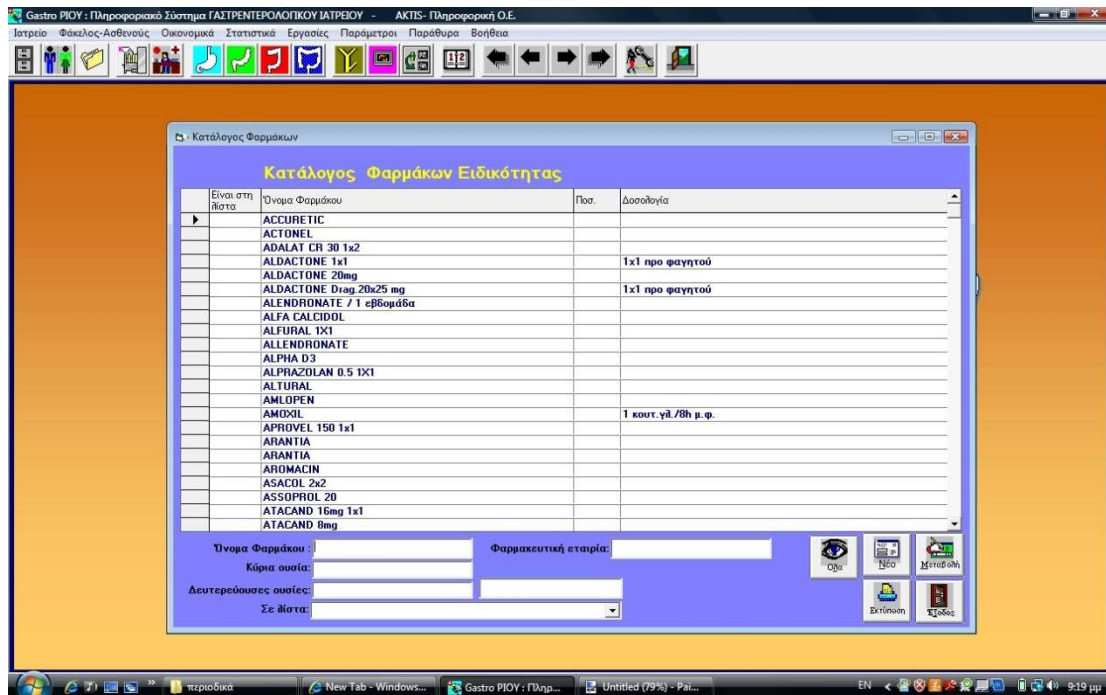
9 Imaging Tests Liver Scintigraphy



10 Imaging Tests – Abdominal ultrasound



13 EHR Software Pop-up menu of options



14 EHR Software List of specialized medications



We indicatively mention the abdominal ultrasound, CT scan, MRI, spiral CT scan of the liver and spleen, gastroscopy, colonoscopy, liver biopsy and several blood tests.

The variety of tests, the different way results are shown but also the means on which the test has been printed (see slide, film, photo or photocopy paper etc) greatly affects any attempt for organization, sorting and creating an index that would make the doctor's job easier and more systematic.

### **The implementation of the EHR at the hepatology center**

This gastroenterology-hepatology center has made an attempt to implement an Electronic Health Record system. AKTIS Informatics SA has installed specialized software with the trade name Gastro – Gastroenterology Center Information System. The software has been installed in a PC at the doctors' office and is accessible to all four specialized doctors of the unit. The implementation and operation of the software is mostly oriented to saving cases in the software's database, mainly for security reasons and less for retrieving critical information.

The main features of the software are the information navigation tabs. More specifically, a windows' environment allows the user to choose from the menu Medical Office the Patient's File and select the patient s/he wants. In a table's format appear the registration number of the patient, the full name and other demographic details. After that, the user can right click to make a selection from a menu and a submenu that's contains at least 18 tabs that include the data of the patient's health record all sorted. The software also includes some cumulative, financial and statistical data and help options with lists of drugs (see photos 11-14).

Entering the data into the system is a crucial procedure undertaken by the unit's secretariat, who collect the forms of the patient's health record and simply type the data. This means that the procedure could entail a significant human error rate. Even in this way, the imaging and other tests cannot be entered into the database, save for some data, such as the opinion of the specialized doctor. This means that for the attending doctor to see the imagining test itself, he has to go back to the printed form of the health record.

### **Discussion**

The suggested meta-EHR system

Given the attempts till now for the installation and operation of the EHR system at the hepatology center, it is obvious how it can improve, enrich and make optimal usage of the benefits that health informatics offer and suggests the need of an electronic system to automate the detection and reporting of notifiable conditions by leveraging the information coded into electronic medical record (EMR) systems. (Klompas et al., 2007)

Administrative databases can be valuable sources of information for epidemiological, health services and outcomes research. These databases usually employ codes such as the International Classification of Diseases, 9th Revision, Clinical Modification (ICD-9 CM) to identify specific clinical conditions. (Kramer et al., 2008)

Evidently, our efforts as well are oriented towards the global adoption and use of the information systems, with emphasis put on their being user-friendly and easy to use. In this way, we can make use of the existing electronic record and also of the corresponding systems that can be used by the same or other departments of the hospital and/or external medical offices and diagnostic centers.

So, we suggest an innovative meta-EHR system that can collect information from several information systems and present them to the user according to his needs, in a friendly and at the same time clear and secure manner.

Let's see some of the main features of the New Meta-EHR system:

- **Accessibility.** The internet technologies will be intensively used here, so that the user can access the system at all times from a wide range of electronic devices and several locations, even through his mobile phone. So, a special edition of the system shall have less requirements and will be appropriate for small mobile devices (smartphones, tablets etc.).
- **Interconnection.** The software will be able to access databases to collect the useful information required each time. These databases can be, for example, the files of the existing EHR program, but also corresponding software used in radiological and other laboratories, either within the hospital or by private healthcare providers.

- Record customization per user. The record can be used by the specialized doctor of an hepatology center, thus consisting a significant tool at every step of his task. It can be done both by quick finding and presenting only the useful information existing in the classic EHR and by using artificial Neural Networks, which will be able to process the data and use them for the diagnosis-treatment of the patient.
- The presentation of the record will be based on the multimedia capabilities that support modern internet applications, thus allowing the user to choose to view data such as imaging tests, comparing charts, photos, videos, even audio messages in the familiar internet setting.
- Distant learning. The user, via easy-to-use wizards that will be regularly updated, will be able to see all features of the software and the edition he uses, while individualized help will be also provided through forums and/or direct communication with software experts that will provide their know-how on a 24/7 basis.

The use of the meta-EHR will offer a series of advantages compared to the tradition EHR, such as:

- Greater assistance to the doctor, by sorting information and creating a diagnosis, treatment, healthcare provision plan for the patient.
- Easier access to a number of medical tests by using multimedia features and automatic abolition of transferring data in the traditional, hard-copy way.
- Easier follow-up of the patient by distance, since the use of the internet and through websites one can follow-up effectively the course of the patient from anywhere there is internet connection.
- Greater organization and presentation flexibility for the information per department and per specialization, by choosing the form of the record depending on the user.
- Ability to better assess the diagnostic tests and the treatment outcome by employing comparative data and presenting the results in a chart form.
- User-friendly. The use of internet, where the working environment is familiar and easy to the majority of the users in combination with the provision of distant helps, such as step-

by-step wizards and webinars and/or the operation of a forum and FAQ library, which allow a more effective and economical support of the user.

- Finally, the upgrading-expansion of the system will be easy and low cost, since it will be based on websites programming and will easily integrate new technologies developed and presented every day on the internet, without requiring huge investments in infrastructure or the support of a multi-member programming team to develop and integrate new features in the software, as is the case with the traditional EHR. This allows independence and administrative flexibility, which are required if we want to always keep up with technology.

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