

Utility Of Software Developed With FileMaker Pro In Japanese Medical Field - Current State and Prospect -

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Abstract - Medical information system such as electronic medical record is very expensive. And it cannot completely satisfy medical care staff. Recently, in some of Japanese hospitals, medical operating support systems are built by medical care staffs. In such cases, FileMaker Pro which is commercial database software is frequently used. In this paper we describe the usefulness and benefit of such a system made with FileMaker Pro.

I. INTRODUCTION

The digital divide is the gap between those with regular, effective access to digital technologies and those without. In the United States, this problem was already discussed in the mid-1990s. Also in Japan, the importance is emphasized in the general information field in recent years. On the other hand, Japanese medical industry is in the midst of rapid change of computerization. For the hospital which cannot keep up with the change, the digital divide is a matter of life and death. However, because small hospitals have been experiencing severe financial difficulties, they are not easy to invest a large amount and to introduce medical information systems by system vendors unlike large hospitals or public hospitals.

In some of Japanese hospitals, medical information support systems are built by medical care staffs. In such cases, the software that is used frequently is FileMaker Pro which is commercial database software.

In this paper, we describe the advantage of such a system and also consider what is really needed by medical care staffs about medical computerization.

II. METHOD

We developed an electronic critical path system named Patient Condition Adaptive Path System (PCAPS) by using FileMaker Pro version 6. This PCAPS is made to respond to change of patients' conditions when a medical practice is performed according to a critical path. In this system, a hospitalization process is divided into some processes and so-called unit pathway is created for every process, and we can go to the final goal (discharge), shifting between the units prepared beforehand according to change of a patients' conditions.

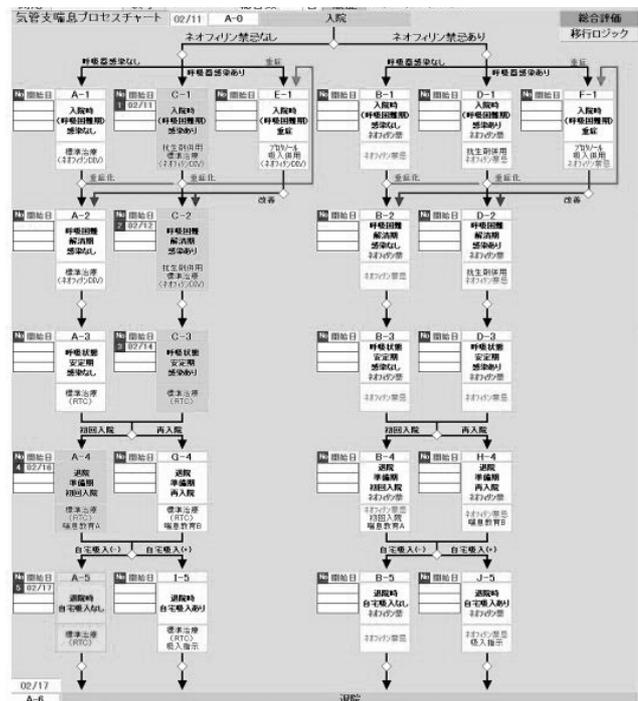


Fig. 1. Clinical process chart in PCAPS

Figure 1 shows clinical process chart (CPC) in PCAPS. CPC is a map tool to make process of thinking of a doctor visible.

A unit of "admission" is arranged at the upper end of a map, and a unit of "discharge" is arranged in a bottom end. Treatment intervention corresponding to a change of the patient state that can happen during hospitalization is posted for several units between "admission" and "discharge". The whole medical team can share process of thinking of a doctor by using this CPC.

Fig. 2. Unit sheet in PCAPS

Figure 2 shows unit sheet (US) in PCAPS. In US, all of medical acts that a medical person should perform in a unit arranged on CPC are described. Each US has a function as a small critical path.

月日	入院当日(1病日) 入院日を1病日とします	2病日 (再発のチェック)	3病日 (再発のチェック)	退院日(4病日) (当日、点検中止)	次回外来まで (数日後)
注射	点検を開始します (水分・糖分補給のため) 吐き止め(10mg)の点検を行います 解熱薬(10mg、30mg)の点検をします 生理食塩水を用いた腹部エコー点検を行います	約5%のお子様は4日以内に再発が見られます 再発を早期に発見し入院時と同様の処置を行います 発熱や下痢など胃腸系の症状を作ることがあります 退院日まで点検を続けます	お子様の状態およびご家庭の都合等に合わせ、適宜点検調整いたします	次回外来受診日をこちらで予約してお知らせします	
内服	抗生物質(オシロ)および吐き気を抑えるお薬(10mg)の服用を再開するお薬(10mg)が処方されます 4日3回内服します 処方完了し、病棟から退院後、病棟に内服開始となります	入院中、適宜病状その他についてご説明しますが、ご不明の点はいつでもお尋ねください	退院時説明があります	退院後に入院時と同様の状態(嘔吐、腹痛、血便)が見られたらすぐに連絡してください	
検査	主治医の診察は毎日あります 毎週火曜日の午後には総診があります	薬剤師より使用しているお薬について説明があります	検査結果について説明があります	退院後の食事制限はありません	
食事	検査完了後、病棟から退院後、まず水分を摂って食事が開始されます 病棟は下痢食です (哺乳瓶の場合は授乳より柔らかめになります 母乳・ミルクのお子様は普段通りです)	点検で水分・糖分の補給などを十分にしていますので 点検をしている間は、食事が取れれば無理に食べたり ミルクを飲む必要はありません	退院後、活動制限はありません		
清潔	1日1回おむつ交換時に身体を蒸しタオルで拭きます	点検が中止になればシャワーが出来ます	退院後は入浴が出来ます		
活動	ベッド上で安静	点検が中止になればプレイルームで遊べます	退院後は保育園、幼稚園、学校等は次回外来までの間はお休みしてください		
備考	トイレ、洗面は可です				

Fig. 3. Critical Path for Patients

Figure 3 shows Critical Path for Patients. It has many illustrations so that a patient is easy to understand it.

Fig. 4. PCAPS analyzer

Figure 4 shows PCAPS analyzer. It is a tool to analyze the result that performed medical care with PCAPS. We improve PCAPS appropriately by analyzing these results by this analysis tool.

We are tackling the full computerization of PCAPS as a research which received the research grant of the Ministry of Health, Labor and Welfare.

Actual employment was performed in the pediatrics ward of Shinko Kakogawa Hospital which is also one of the research cooperation hospitals of this research group.

III. RESULTS

A critical path as a work schedule in the general industrial world is introduced into the medical industry, and the usefulness came to be esteemed as a communication tool between a medical worker and a patient and also between medical workers. It surely has many potential benefits, but sometimes doesn't work effectively because a present pathway is not flexible to diversity of change of patients' conditions. In order to solve this problem, we developed an electronic critical path system using commercial database software called FileMaker Pro.

Our system has many benefits, which is easy to build, flexible and cost-efficient in comparison with other medical record systems built by big IT vendors.

This is only one of the examples about a handmade system by medical care staff in Japan.

As far as I know, in several hospitals including a national hospital and some public hospitals, various handmade systems are working such as “Incident report system”, “Clinical pathway system”, “Reservation system”, “Nutrition support system”, “Infection control system”, and so on.

Variety of Handmade System Developed with FileMaker Pro

- Type of usage
 - Standalone
 - File Sharing
 - Client / Server system
 - Web based system
- Purpose of utilization
 - Document preparation
 - Medical support system
 - Knowledge database
- Positioning in a hospital
 - Personal level
 - Cross-sectional management tool
 - Medical support system (No cooperation with main system)
 - Cooperation system with order entry system (OES) and / or electronic medical record (EMR)
 - Department level

Fig.5. Variety of System

Such handmade systems developed with FileMaker Pro are variety of aspects in a Japanese medical scene. Figure 5 shows clinical process chart (CPC) in PCAPS. The type of usage, the purpose of utilization, and the positioning in a hospital are summarized in figure 5.

Spread of Handmade System Developed with FileMaker Pro in Japan

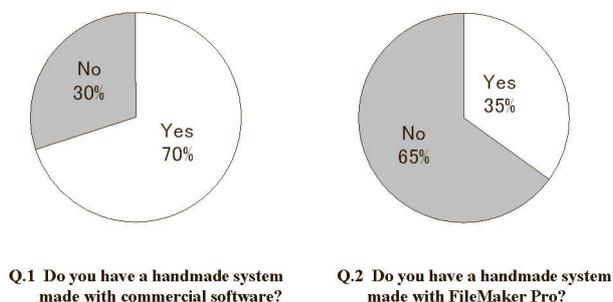


Fig.6. Spread of handmade system in Japan

Figure 6 shows the result of the questionnaire survey conducted by Japanese Society for Clinical Pathway. It revealed that 70% of hospitals surveyed have a handmade system made with commercial software. Moreover, FileMaker Pro accounts for 35% of such commercial software.

The advantages of such handmade systems developed by medical care staff are described below. They can completely satisfy their requirements. And they are easy to change the system according to new requirements. The reason is because they are invented and built by themselves. And they do not cost very much, because they are made by medical care staff as a part of their daily medical work.

However, there are a few problems as follows. When the person who made the system leaves the hospital, it sometimes becomes a problem about who takes care of it. Actually, it is not unusual that such an orphan system does not operate well after its author disappeared. Another problem is about evaluation of a medical person making a system. It is thought he should receive additional payment as a system creator. But actually in such a case the person usually would receive payment only for his medical work. Another problem is who owns the rights to the system. If the system making was performed in a range of a normal medical work, it will be proper to think the hospital owns the rights. However, a system creator will be dissatisfied when there is no reward of system making and no proprietary rights of the system.

It will be important to build proper structure relating to appropriate evaluation for a handmade system by medical care staff themselves and the legal handling of the system.

IV. CONCLUSIONS

Original medical systems developed by medical care staffs are very useful. In many aspects, there are plenty of advantages to medical care staffs. The reason is because such systems are invented and built by themselves.

ACKNOWLEDGMENT

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