

Development of an Electronic System for Home Peritoneal Dialysis Patient Record Notes

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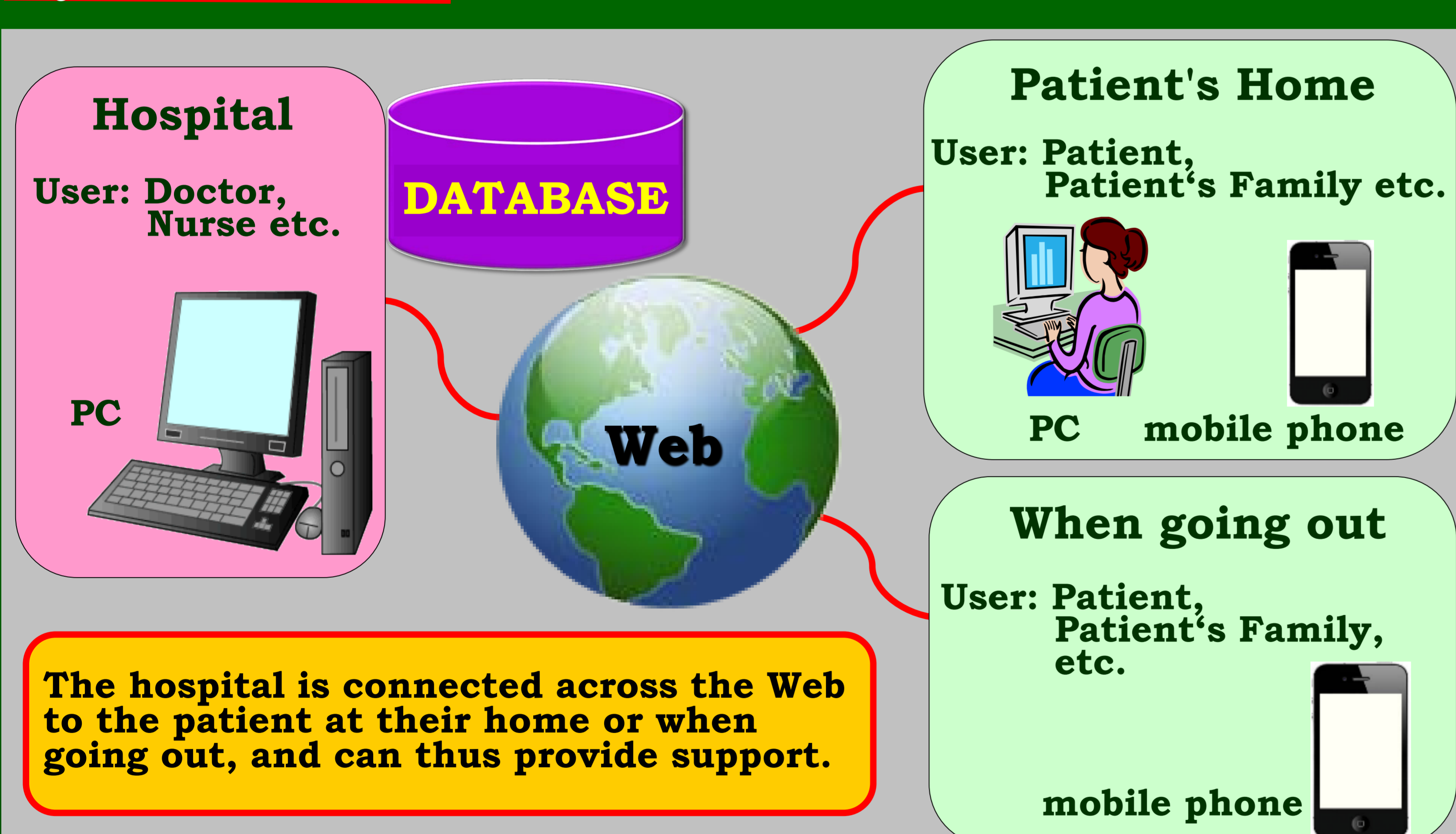
Introduction

Peritoneal dialysis differs from dialysis performed in medical facilities. A peritoneal dialysis patient can perform dialysis easily at home, and also reduce the number of regular hospital visits. This improves quality of life (QOL), and results in retention of kidney function and a high degree of patient satisfaction. However, as this is associated with reduced observation by medical staff, such as nurses, it is more difficult to ensure infection prevention, quantity of dialysis fluid, and determine the color of dialysis waste fluid in home dialysis patients. We have developed a system that allows a nurse to monitor the patient's record notes sequentially with an interactive video call system using a color correction function on the WWW.

Methods

This Web-based system uses the Apache web server, PHP, and the MYSQL database. The Web camera system is set up as follows: patient side, Qcam Orbit AF QCAM-200RX (Logicool Co. Ltd.); hospital side, HD Pro Webcam C910 (Logicool Co. Ltd.). In addition, the system used a telephone call system with Skype, and a remote control system with TeamViewer. Moreover, the CSMATCH color chart is used for image color correction. In this study, a surrogate patient and a medical staff talked using the interactive television telephone call system. Moreover, an abdominal photograph was taken using a Skype snapshot of the catheter. Agreement regarding the schedule of the television telephone call with the surrogate patient was performed over the WWW. When taking the photograph, the surrogate patient placed the color chart on the affected area, and performed color correction of the picture. The photograph taken by the medical staff is uploaded to the WWW, saved as information for the surrogate patient, and used for monitoring.

System Outline



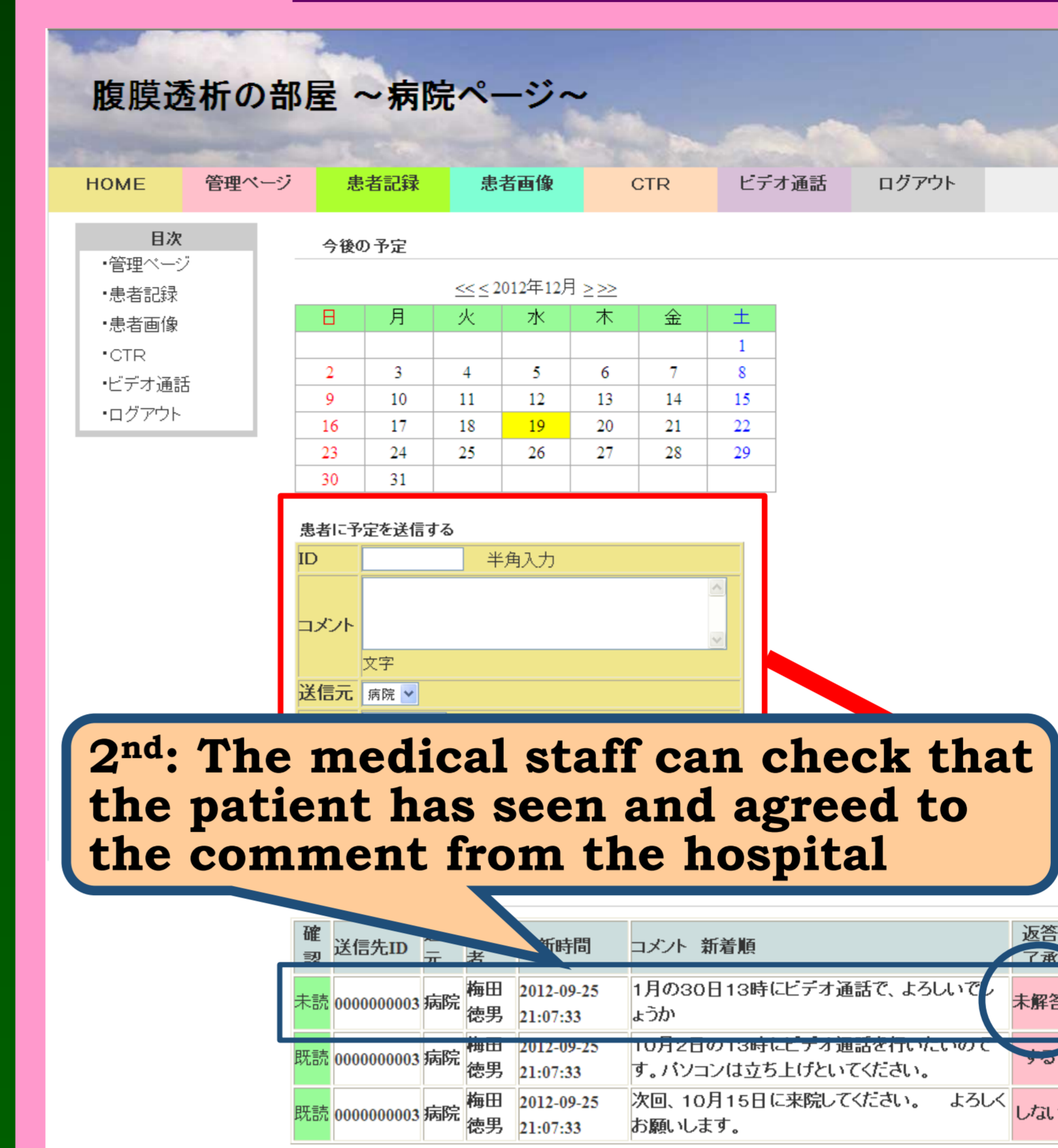
Results and Discussion

Using the system discussed here, the surrogate patient could be told about the video call schedule from the hospital side, and provide consent. Moreover, remote control systems were used at the time of the video call. The web camera on the patient side was operated by remote control from a PC on the hospital side, and arbitrary areas could be photographed as necessary. The clinical usefulness of the interactive video call with peritoneal dialysis patients was confirmed previously [Paloma Gallar et al. Journal of Telemedicine and Telecare 2007, 13, pp. 288–292.]. Color characteristics differ between computer monitors. In this study, to accurately determine the color of dialysis waste fluid, we performed color correction using a color chart on the monitor. This allowed reproduction of the true color that was not influenced by the color tone of the monitor. The picture and medical information of the surrogate patient with color correction were uploaded to the web page for the hospital, and archived in the database. Moreover, the retrieval and display of the surrogate patient's medical information could use the uploaded picture and medical information using the patient's ID or upload day. This facilitates information sharing between medical staff using the developed system.

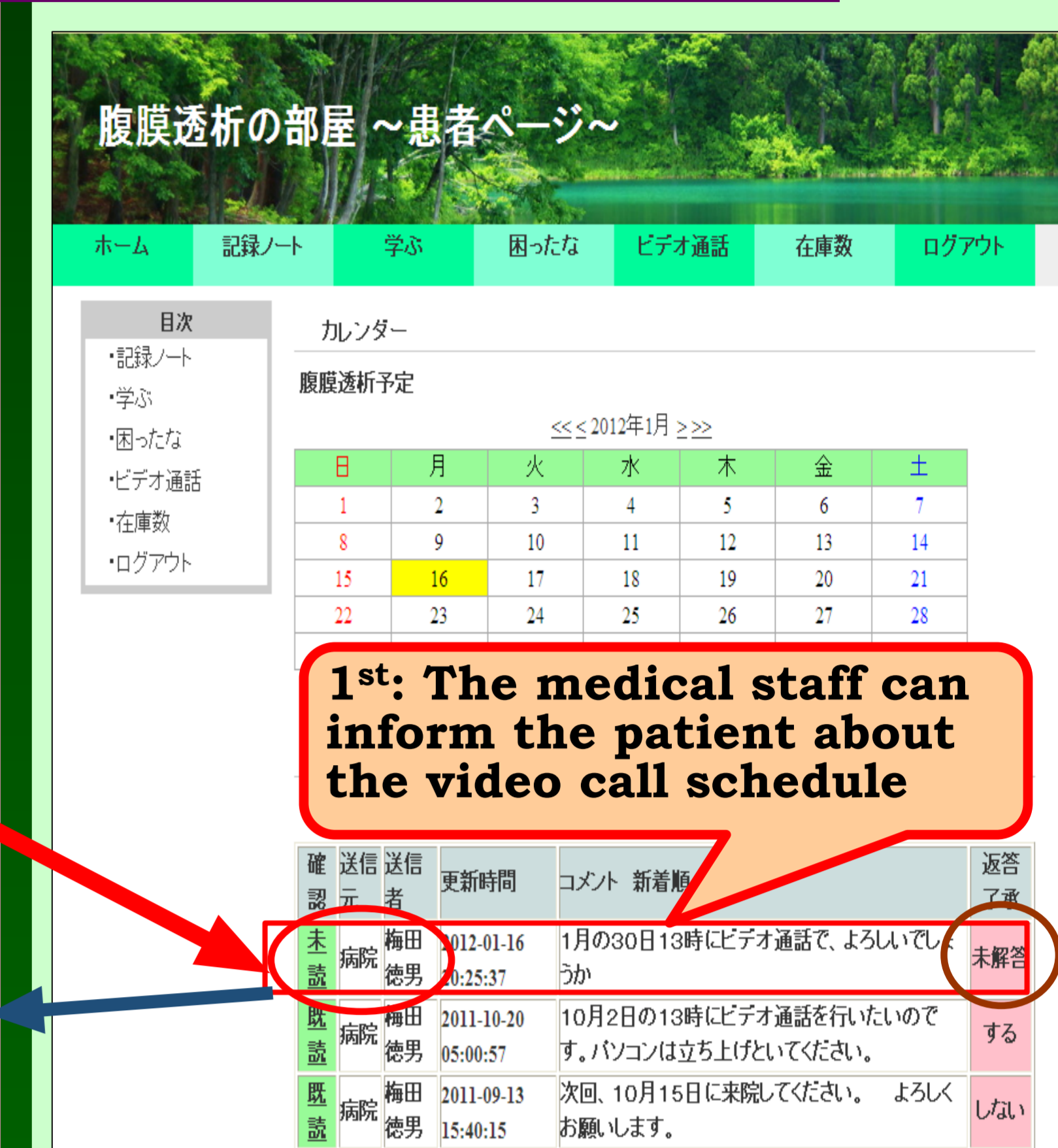
Example of Display

Hospital Side System

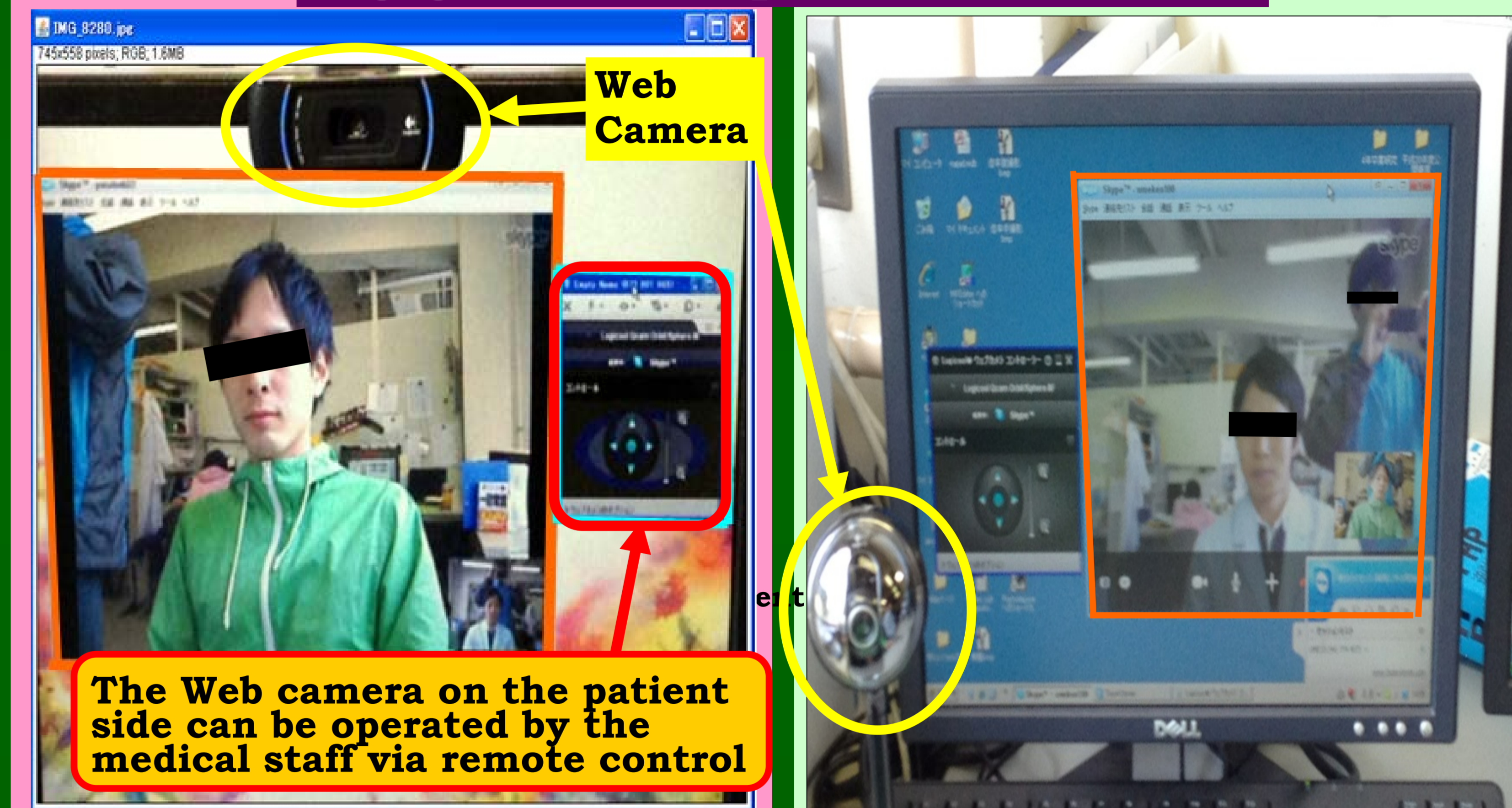
Message regarding the schedule of the video call to the patient from the hospital side



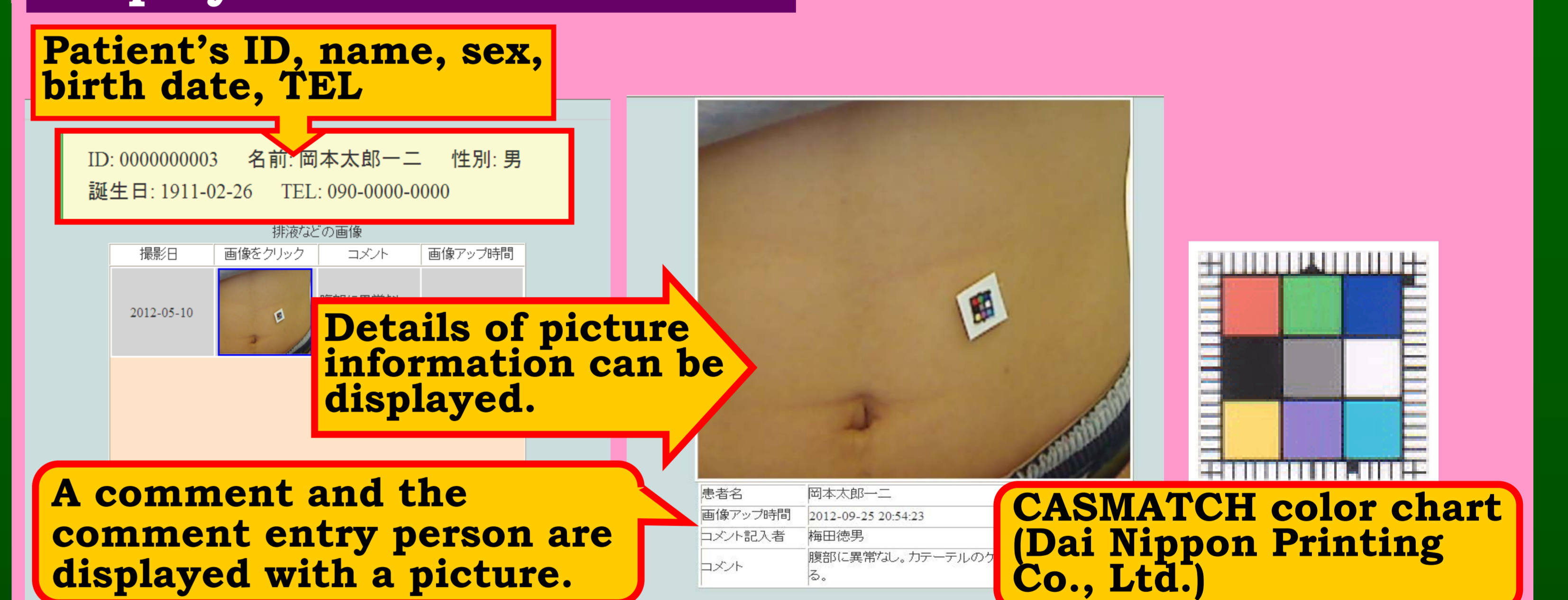
Patient Side System



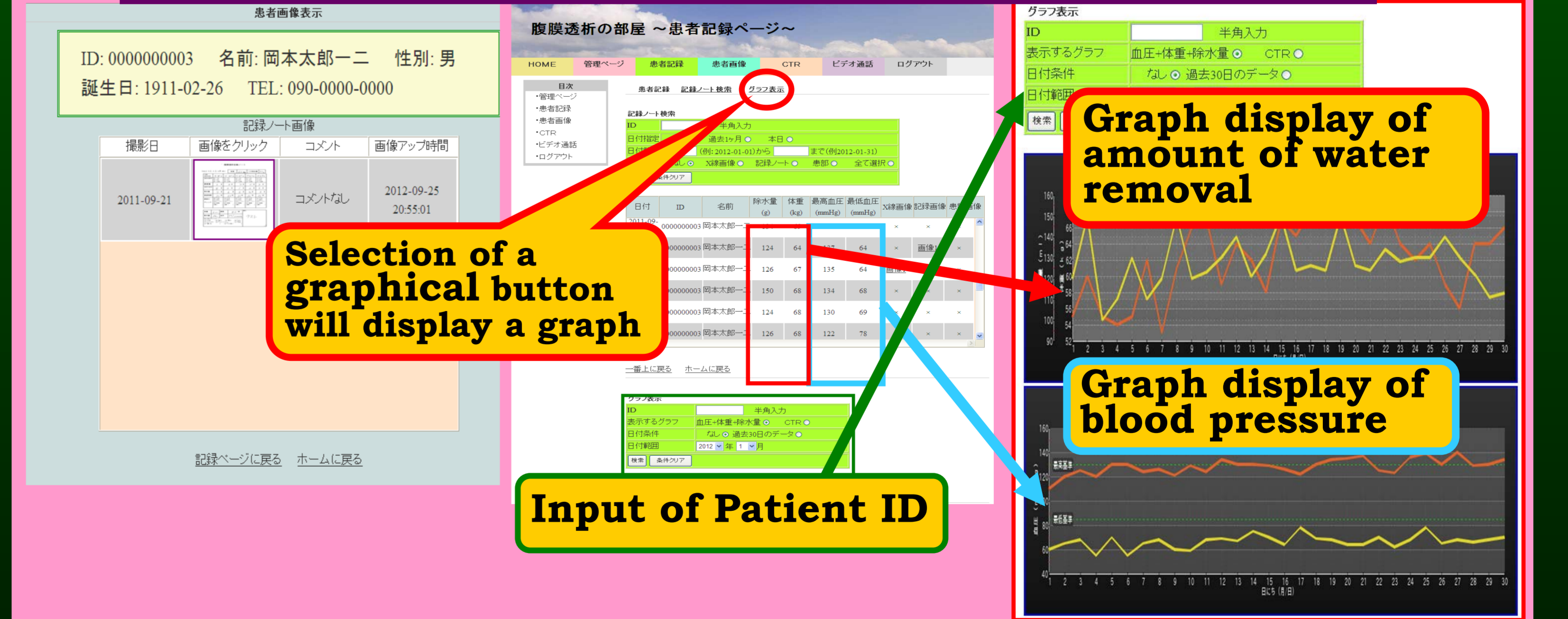
Example of medical staff and patient engaged in video phone call



Display of Color Correction



Display of Record Note System (Hospital Side)



Conclusion

The system developed here can provide instruction, observation, etc., of catheter care at remote home care sites every day. Moreover, the progress at the affected part can be monitored by color correction of photographs taken with the interactive video call system and archiving in a database.