

Effective telemedicine consultation on the treatment of hypertension

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***Abstract:* This paper describes how an innovative Finnish ambulatory blood pressure monitoring service is organized and implemented, and illustrates the various benefits of the monitoring method and service model compared to the traditional procedure.**

Introduction

In ambulatory blood pressure monitoring (ABPM) a patient's blood pressure is measured automatically with a portable device every 30 minutes for a period of 24 hours, resulting in a comprehensive representation of the actual blood pressure level. The ambulatory measurements take place during a normal day in the patient's life, leading to a more realistic account of the patient's blood pressure profile compared to traditional clinical measurements¹.

There are numerous benefits to ambulatory measurements², some of which are listed here: With the help of ABPM white coat phenomenon and reverse white coat phenomenon can be detected. The first is the elevating effect of a measurement performed by a health care professional. The second causes the blood pressure to appear lower than usual in a clinical setting. With the help of ambulatory measurements the effects of drug treatment over 24 hours can be evaluated. Test results³ show that conventional blood pressure measurements in elderly people often produce considerably higher results compared to ambulatory measurements, which can lead to overmedication and ultimately hypotension. Also, with ABPM nocturnal hypertension and variation between daytime and nighttime blood pressure levels can be assessed.

In Finland, municipalities are required by law to organize and finance healthcare for their inhabitants. Primary healthcare is provided by health centers employing mainly general practitioners and nurses. When a general practitioner suspects that a patient needs specialized care, he or she is usually referred to a secondary care sector hospital. Unfortunately the waiting

times for referrals in the secondary care and the distances between municipalities and hospitals can be very long.

The remote analysis service operator equips a healthcare facility with as many monitoring devices as they need without requiring any investments. A nurse sets the patient up with a monitoring device and sends the patient home. On the following day, the patient returns with the device. The nurse then uses a private internet portal to upload the anonymous data to a remote server over a secure connection. The data is checked for accuracy by technicians and then put forward for specialist (cardiologist or internist) analysis. The specialist writes a report complete with treatment recommendations, which is then returned for download at the internet portal.

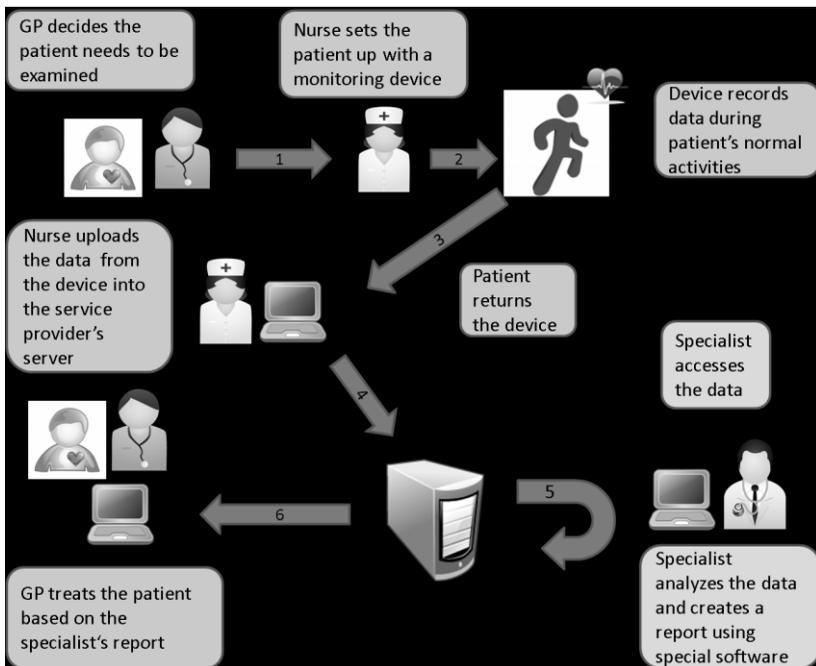


Figure 1. The remote analysis operating model.

Charges are based on the number of delivered reports, with a minimum of ten reports per year during a four-year contract period. The innovative service model provides specialist reports to primary care centers, thus making it possible to refer only the patients who actually need secondary care

treatment. Furthermore, with this model the specialists can put their expertise to a much wider use than normally.

In addition to ABPM the system includes sleep apnea monitoring and Holter ECG monitoring services. The service model is in use in over 150 locations all over Finland. In 2010 10347 consultation reports were delivered, of which 1346 were ABPM reports.

Objectives

This preliminary research project was carried out in order to examine the concrete benefits of the ambulatory blood pressure monitoring method and specialist consultation reports, and to determine the advantages of a telemedicine consultation service. It will be followed by a more extensive project done in collaboration with Laurea University of Applied Sciences. In the follow-up project patients who were treated with the help of specialist remote consultation reports will be observed and the results will be compared with those of a control group of traditionally treated patients. The economic benefits will also be taken into account. The follow-up paper is to be published in 2012.

Methodology

A quantitative descriptive study was selected as the research method. During March and April of 2010 RA Ltd delivered 247 ABPM reports to Finnish healthcare units. Those were selected as the sample batch for statistical analysis and examined individually. The selection of the sample was based on two requirements: Firstly, the sample had to be large enough to provide a truthful representation of the phenomenon under investigation. Secondly, it had to be recent enough to reflect the current situation of blood pressure management in Finland.

Results

Of the 247 monitorings, 157 (63.6 %) were performed on females and 90 (36.4 %) on males. The median age was 56 years for females and 53 years for males, the youngest patient being a 16-year-old male and the oldest a 91-year-old female.

The average delivery time of the reports was 69.4 hours (2.9 days) starting from the moment the registration was uploaded into the service operator's server. The delivery time includes weekends and bank holidays.

The analysis showed that two thirds (66.4 %) of the reports included a recommendation to start, stop or adjust medication in some way. These include for example a recommendation to reduce medication of one patient because of white-coat phenomenon and to add a calcium channel blocker to the existing medication of another patient. Signs of white coat phenomenon were found in 26.7 % of the cases (31.2 % of females and 18.9 % of males). Reverse white coat phenomenon was diagnosed in four cases. Abnormal diurnal variation was diagnosed in 30.3 % of the cases. This figure includes small, large and reverse diurnal variations.

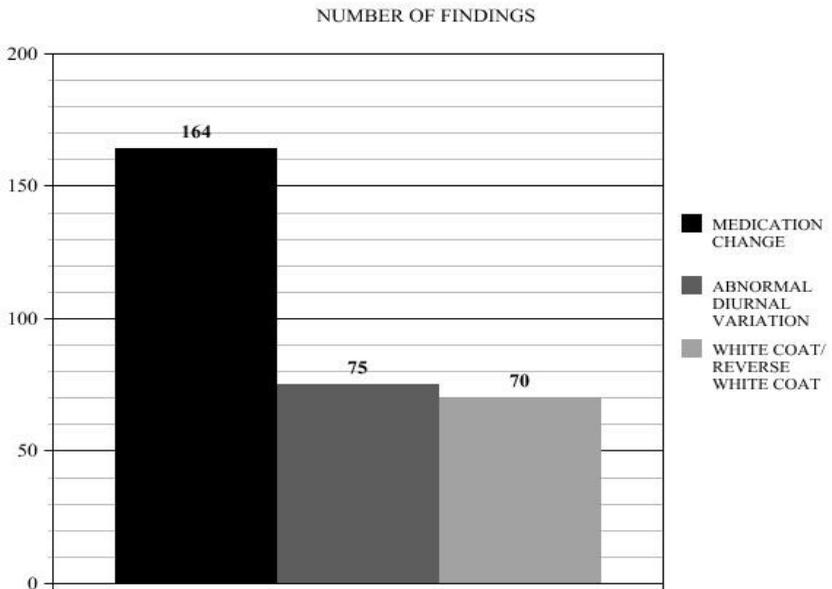


Figure 2. Results.

Conclusion

This report has put forth tangible evidence indicating that the service model of Remote Analysis Ltd is a very useful and efficient way of examining blood pressure. Based on the high incidence of significant findings in the sample it is very apparent that there is a lot of room to improve the quality of care currently provided to hypertension patients. The results suggest that the information in the ABPM reports, along with the specialist's recommendations, helps the general practitioners to treat their patients better.

It is also clear that the model reduces queues to secondary care by allowing patients to be screened very rapidly before referring them. The model also helps to control the costs of specialized care and enhances the accessibility of healthcare. In light of this information is reasonable to conclude that the model should be made a standard tool in healthcare systems globally.

References

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