

# Remote monitoring in cardiac surgery.

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## Introduction

The critical information includes the long-term survival after cardiac surgery (mortality), the percentage and type of complications, the quality of life of the patient and the underlying disease progression. These indicators can reflect the safety criteria, the guarantees of high quality of medical care, an individual approach to each patient-client, gain the trust of patients and provide a favorable impression of the clinic.

## Purpose

Development, organization, and implementation of a program that makes it possible to automatically receive the patient's data with digital questionnaires.

## Methods

### Steps:

1. the analysis of the current standardized questionnaires
2. the development of in-house questionnaires
3. the development of a module of the hospital information system for filling and processing data
4. forming the doctor asks to fill out the questionnaire before the hospital admission and after discharging the patient

### Workflow:

The questionnaires and the planned schedule of filling them are attached to the patient's chart.

The information system sends automatic to team to be in charge: a doctor and/or a call-center operator – a patient – the 'Questionnaire' information module.

The notifications to the patient's email.

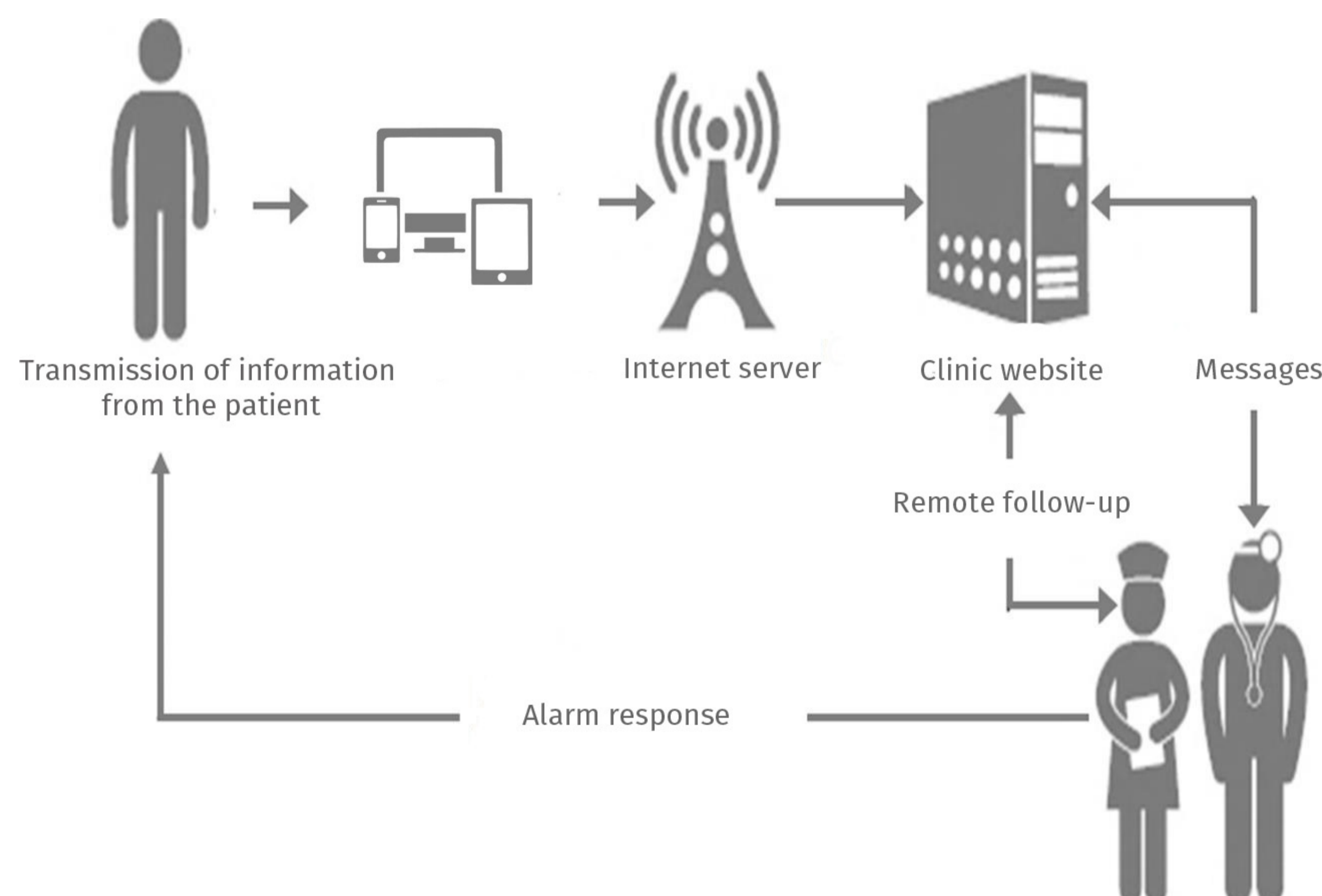
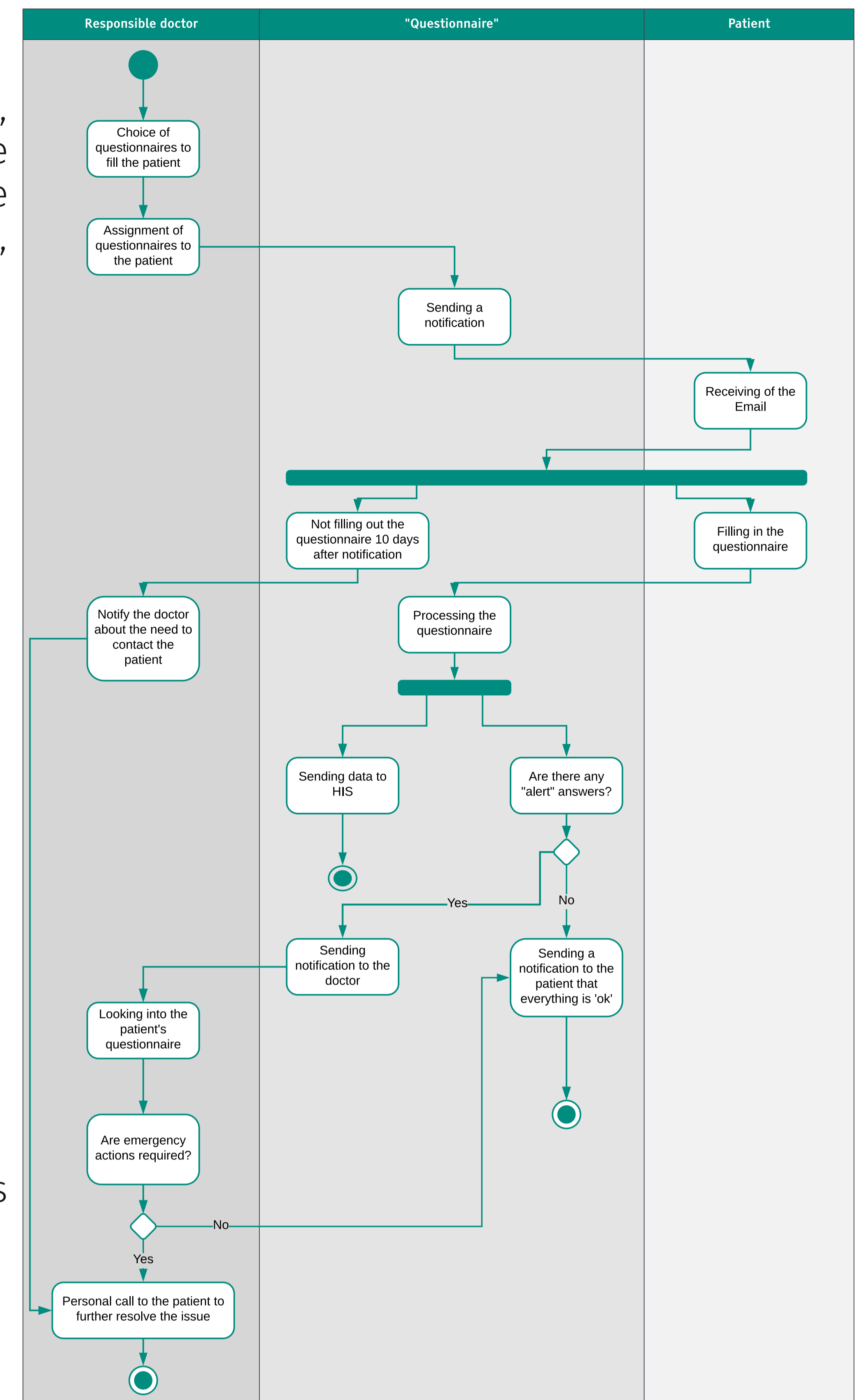
The patient clicks on the link in the email and completes the questionnaire on a personal computer or a mobile device.

Each questionnaire has an 'alarm' reply function in accordance with the main condition. If the survey involves calculation of certain parameters, then the degree of the 'alarm' is calculated on the basis of the reference data.

If there are no 'alarm' replies, then the patient receives a letter with the evaluation of their health condition.

If the system finds 'alarming replies', it automatically notifies the person in charge, after which the survey is analyzed manually.

If it is necessary, the doctor might personally contact the patient and/or their relatives to plan further actions.



## Results

1. On 01.03.2018, the Hospital Data Analytics department was organized as a part of the medical institution.
2. The module of 'remote monitoring' has been created in the hospital information system.
3. SF-36 and other clinic-based forms are used for surveying adult patients after the cardiac surgery, children under 18 (the surveys are completed by parents), and the patients who had gone through a carotid artery surgery.
4. The system of remote monitoring has included all patients admitted to the Cardiovascular Surgery Clinic after their voluntary consent. Also, the program included the patients who had surgeries from 2009 to 2018.

5. The program involves 2356 patients, of whom 1878 are active respondents (the feedback rate is 79,7%).

6. 364 surveys with 'alarming replies' have been analyzed. Individual measures have been taken to improve the health condition of each patient in this group.

7. The indicators of long-term mortality for 2018 are the following: 3-month mortality – 1 patient (a child had pneumonia), 6-month mortality – 2 patients (myocardial infarction, the progression of heart failure)

## Conclusion

The information obtained by the remote monitoring program allows increasing the quality of medical care for the patients after cardiac surgery.