The capture and processing of routine clinical data in a cardiology department.

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Summary Three optical mark reader (OMR) forms are used to store and process clinical and haemodynamic data. One OMR form records details of the cardiac catheterisation in summary form and is processed to produce an audit of catheter laboratory performance and an extract by which all cases having the same criteria can be identified for clinical research. A second OMR form records the symptoms, certain important points in the history, the physical signs and the chest x-ray, electrocardiographic (ECG) and echocardiographic findings. A third OMR form records the results of special investigations aimed at identifying cardiovascular and respiratory pathology. From these last two OMR forms the computer generates a clinical report for distribution to colleagues and the case notes. This report has given a significant saving of secretarial and medical time compared to previous methods and is acceptable to those who receive it.

1. INTRODUCTION

As part of the DHSS experimental medical computing program, St. Thomas' Hospital has developed a number of applications on a medium scale time-sharing computer capable of supporting some 30 terminals with concurrent batch processing. One major application is a microbiology result recording system (Williams et al, 1978)\(^1\) which uses OMR techniques and a reading device in the laboratory. Many of the programs and software routines used by the application are table driven and their details have already been presented (Davidson et al 1979)\(^2\).

2. THE SYSTEM

The cardiac application comprises two major parts; one OMR form recording details of cardiac catheterisation and two OMR forms recording the results of the clinical examination and special investigations for both inpatients and outpatients.

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2.1 The catheter OMR form

This form, which will not be described in detail, records a summary of the catheters used and procedures employed at cardiac catheterisation, any complications, the haemodynamic and diagnostic findings. The data thus captured are used to produce management statistics and for retrospective research.

2.2 The patient examination OMR form

This document records the findings at a clinical consultation with particular emphasis on the physical examination. The top of the form records identifying information such as hospital number, age, sex, etc. Next comes a list of important events in the past history followed by the symptoms experienced by the patients. Thencome details of the physical signs, the chest x-ray, ECG and echocardiogram. The doctor adds extra manuscript information on a separate sheet and this normally includes the past medical history, family history, and current drug therapy.

2.3 The investigations OMR form

Some patients require more extensive investigation and the results of the more common investigations associated with heart disease are included on this document. This OMR form has recently been implemented and allows for:

- lung function tests including spirometry and gas exchange measurements together with blood gases
- 24 hr ECG monitoring giving the basic rhythm and identifying any rate disorders
- exercise testing specifying the peak load achieved and the reason for stopping the test together with details of ECG changes and symptoms, both during the test and in the recovery phase
- venous occlusion plethysmography identifying changes in peripheral blood flow
- myocardial perfusion scans giving the location and type of perfusion defect
- pyrophosphate ("hot spot") scanning
- first pass perfusion studies detecting intra-cardiac shunts and measuring ejection fraction
- gated blood pool measurements recording the location of abnormal myocardial movement together with an estimate of ejection fraction
- lung scans giving details of ventilation or perfusion defects and a diagnostic interpretation of the scan.