

MOBILE CORONARY CARE UNIT

MODIFIED MOBILE CORONARY CARE UNIT

By Michael F. O'Rourke

INTRODUCTION

Following publication of the Belfast group's initial experience with a mobile coronary care unit in 1967¹ the cardiovascular unit at St. Vincent's Hospital sought ways of providing a similar service for the eastern suburbs of Sydney. With available financial and staff resources it was considered impracticable to copy the Belfast system in having a specially outfitted vehicle available at all times for coronary calls. It was decided to introduce a modified system using portable equipment capable of being carried in any ambulance together with on-duty hospital staff and the existing ambulance system.

This coronary ambulance service was initiated in 1969 with the help of the Central District Ambulance Service (C.D.A.) of Sydney. Some six months after its implementation, a similar service was commenced from the Prince of Wales Hospital (approximately three miles from St. Vincent's Hospital) enabling coronary

A detailed breakdown of the hospital diagnosis and course of the first 116 patients has been given². Of the 105 admitted to hospital 66% proved to have myocardial infarction and 76% had acute coronary heart disease. In only three cases was it considered that a coronary ambulance call was unwarranted. These proportions are in line with experience elsewhere^{1,3,4} and have been maintained over the ensuing years. The frequency and nature of arrhythmia complications have likewise been similar to those reported by others^{1,3,4,5}.

Patients admitted through the coronary ambulance service have in general been more seriously ill than patients admitted through conventional channels. In the first 21 months of operation, coronary ambulance admissions averaged one in ten of all admissions with myocardial infarction to the two hospitals. In the ensuing nine months this figure has risen to approximately one in eight.

Table 1 shows the times taken by the modified ambulance service during the four years of its operat-

TABLE I
AVERAGE TIMES TAKEN IN THE DIFFERENT PHASES OF
THE CORONARY AMBULANCE CALLS

	1969	1970	1971	1972
1. Call → ambulance at hosp.	5.1	6.9	6.8	6.5
2. Call → ambulance leave hosp.	7.3	9.7	9.9	11.3
3. Call → ambulance at patient	13.8	16.0	17.1	19.0
4. Call → ambulance depart	38.1	32.8	36.7	34.5
5. Call → ambulance at hosp.	47.7	41.3	46.3	45.6

ambulance cover to be extended to all 400,000 citizens in the eastern suburbs of Sydney. Both services were co-ordinated through C.D.A. and have functioned as a unit.

The initial (21 month) experience of the Sydney service has been described². It is proposed here to review this briefly and to add further information from the following nine months of operation.

ARRANGEMENTS

Portable battery operated defibrillator—oscilloscope units together with equipment and drug bags and simple ventilators are kept in an easily accessible part of the emergency department of the two hospitals. A 24 hour roster of on-duty staff is maintained (medical registrar and/or senior resident medical officer plus coronary care trained nurse). Hospital staff are alerted by the hospital switchboard which is notified of a coronary ambulance call by the C.D.A. control operator. A coronary ambulance call is initiated by a medical practitioner calling C.D.A. control and specifically requesting the 'coronary ambulance'. The ambulance control officer alerts the appropriate hospital switchboard operator as well as the closest available ambulance which proceeds as quickly as possible to the hospital. Ambulance and hospital staff rendezvous in the hospital's emergency department; equipment is loaded and the ambulance speeds to its destination. At its destination, all haste is abandoned and equipment is taken to the patient's side.

RESULTS

In the 30 months to March, 225 coronary ambulance calls were received. Twenty three patients were dead on arrival of the ambulance and could not be resuscitated. Two hundred and two patients were transferred to hospital. There were no deaths after arrival of the ambulance or in transit.

All have remained relatively constant except the time taken for the ambulance to leave hospital, which increased from 7:3 to 11.3 minutes. This could indicate a declining enthusiasm on the part of hospital staff for their role in the service; it is the only sign of deterioration in the service. Total time taken on a coronary ambulance call continued to average approximately three quarters of an hour. Patients were reached on an average within 20 minutes of receipt of the practitioners call. These times compare favourably with those reported elsewhere^{1,4,5,6}. The modified coronary ambulance service has continued to operate efficiently and well without dislocation of other hospital or ambulance services and with a cost estimated realistically at \$25 over and above a conventional ambulance call².

Besides providing better care for coronary patients in the area served, the ambulance service has been used for other tasks including transport of patients with heart block and cardiogenic shock from suburban hospitals and meeting helicopters and aeroplanes carrying seriously ill patients from further afield. All this has helped our teaching hospitals become a little more obviously relevant and helpful to the community about them, and have helped hospital staff gain more knowledge and understanding of their colleagues in practice outside the hospital and more appreciation of their paramedical confreres in the ambulance service.

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PRE-HOSPITAL CORONARY CARE: THE ROLE OF A RAPID RESPONSE MOBILE INTENSIVE/CORONARY CARE SYSTEM

By Leonard A. Cobb

A pre-hospital coronary care program was initiated in Seattle in March 1970. The program is a cooperative effort involving Harborview Medical Center, the Seattle Fire Department, and the University of Washington. We have utilized the existing emergency medical activities of the Fire Department, supplemented by an extensive paramedic training program and an additional emergency vehicle functioning as a mobile intensive/coronary care unit. The system provides rapid response (2-5 minutes) to persons with life-threatening medical emergencies. Physician supervision is carried out by radio or through standing written orders. Patients with suspected cardiac emergencies are admitted directly to any of the coronary care units in the city.

During the first two years of operation the unit was dispatched to 4,891 patients—511 of whom had ventricular fibrillation when first seen. Ninety-two persons received life-saving therapy prior to hospital admission and were subsequently discharged from the hospital. Fifty-seven of these long-term survivors were unconscious and had ventricular fibrillation upon arri-

val of the emergency aid units, and 8 developed ventricular fibrillation after arrival of the paramedical personnel. The average age of the patients with ventricular fibrillation was 57 years. Therapy included cardiopulmonary resuscitation, defibrillation, endotracheal intubation, and administration of drugs. The vast majority of the patients with ventricular fibrillation had underlying coronary heart disease, although less than 50 percent had a diagnosable acute myocardial infarction on the basis of ECG and LDH isoenzymes during the post-resuscitation hospitalization.

Although circulatory arrest was often not accompanied by alarming prodromata, we believe there is nevertheless an important role for public education in the prevention of sudden cardiac death—first, in making available easy access to the emergency medical system, and second, in extensive training of the public in the techniques of cardiopulmonary resuscitation.

Whereas a direct attack on atherogenesis is the optimal goal for prevention of sudden cardiac death, a more immediately attainable goal is secondary prevention by appropriate anti-dysrhythmic therapy; as yet, this is a relatively unexplored area. In the meantime, a significant number of patients with ventricular fibrillation occurring outside the hospital can be salvaged with currently obtainable emergency medical systems.

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