Télécardia© Validation Study

INSTANTANEOUS ELECTROCARDIOGRAPHY AND OCCUPATIONAL HEALTH

Dr Claude BRESSY, Specialist in Occupational health, AMSBTP

Dr. Laurent TALAZAC, Head of the PARSYS TéléCentre

PARSYS S.A.: 5 rue Ponscarme 75013 PARIS +33 173782700

PARSYS TéléCentre: Z.I. Novital - Chemin de Casselèvres 31790 SAINT JORY +33 561357975

Contents

Dr Claude BRESSY, Specialist in Occupational health, AMSBTP

AMSBTP, 33 rue Bourgmayer, 01000 Bourg en Bresse

Dr. Laurent TALAZAC, Head of the PARSYS TéléCentre

PARSYS Santé – ZI Novital – Chemin de Casselèvres 31790 Saint Jory

Introduction

Heart problems are of increasing importance in occupational health and more and more units are acquiring electrocardiography equipment, ECG remaining the essential examination to screen for and monitor cardiovascular disease.

The occupational physician is particularly well placed to record a baseline trace for any new employee, followed by regular follow-up tracings. He/she is also well placed to use such information to inform the decision as to when the subject should return to work after a cardiovascular event—or even record a trace while the event is underway (chest pain, palpitations, malaise).

However, conventional electrocardiography takes a long time, is somewhat complicated to carry out and requires bulky equipment (especially inconvenient in mobile units). Moreover, interpreting electrocardiograms is not always evident. For the medical profession, PARSYS has developed **Télécardia©**, an easy-to-use, compact machine that makes recording an electrocardiogram as rapid and simple as a blood pressure measurement—so simple indeed that the patient can perform a "self capture" (see Appendix).

1. Equipment used for the study

Télécardia© represents a major step forward in portable medical equipment.

It records a 12-lead ECG yielding 12 simultaneous channels, corresponding to a standard electrocardiogram as recorded with routine equipment but without many of the disadvantages of the conventional material.

Télécardia©

Assisted capture

Self capture

Once the data have been acquired, they are automatically transferred to a PC (via a wireless Bluetooth connection).

Electrocardiograms recorded using the Télécardia© device are reliable and tracing quality is comparable to that of conventional machines.

Télécardia©: cardiovascular telemedicine

For occupational specialists who need an in-depth interpretation of a patient's electrocardiographic data, the physicians of the PARSYS Télécentre offer diagnostic support for tracings recorded using the Télécardia© system.

PMCWC is a special support platform for PARSYS customers, based at Saint-Jory near Toulouse, one of the centres of the development of Telemedicine, worldwide.

After interpretation by a qualified, specialist physician, the occupational physician who originated the trace is sent a report.

Télécardia© has been granted EC Medical Marking (CE0459) for the class "Diagnostic Medical Devices".

2. Methods

This prospective study was conducted on **162 male construction workers** (age: 19-64) between August 2007 and March 2008.

ECGs recorded by Dr. Bressy in either the clinic or the mobile unit were sent via the Internet to PMCWC for interpretation.

ECGs were recorded on an ad hoc basis, whatever the reason for the consultation although those in high-risk occupations—crane operators, and drivers of heavy machines and HGVs—were systematically given the examination.

3. Results

No significant difference emerged between the different categories of workers studied.

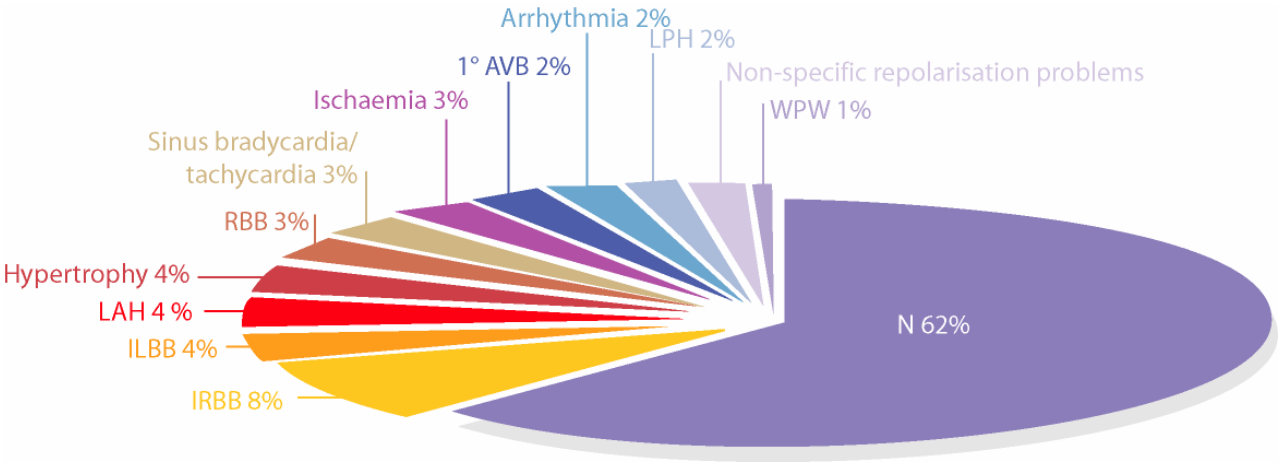


Figure 1: breakdown by electrocardiographic disease

Taking all the tracings together, they can be broken down into three broad groups:

- **Normal tracings (N): 62**%

- **Tracings showing minor problems: 21%.**

  I.e. Incomplete left or right branch block (ILBB and IRBB), left anterior hemiblock (LAH), sinus bradycardia or tachycardia, and non-specific repolarisation problems.

- **Pathological tracings: 17%.**

  Namely:

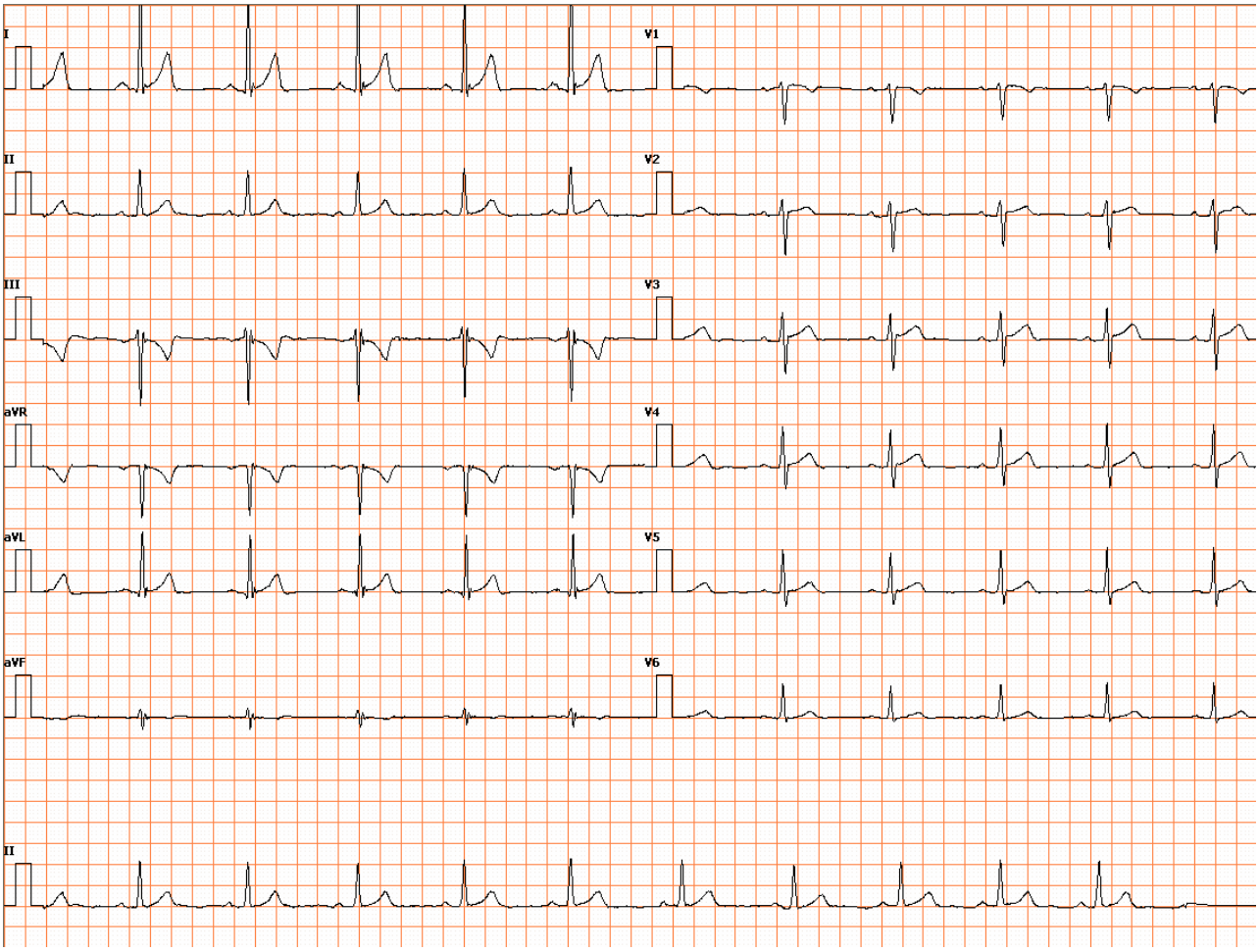
  - arrhythmia (TdR), notably due to atrial fibrillation or bigeminy

  - frank conduction problems: first-degree atrioventricular block (1° AVB), left posterior hemiblock (LPH), complete right branch block (RBB), one case of Wolf Parkinson White (WPW) syndrome

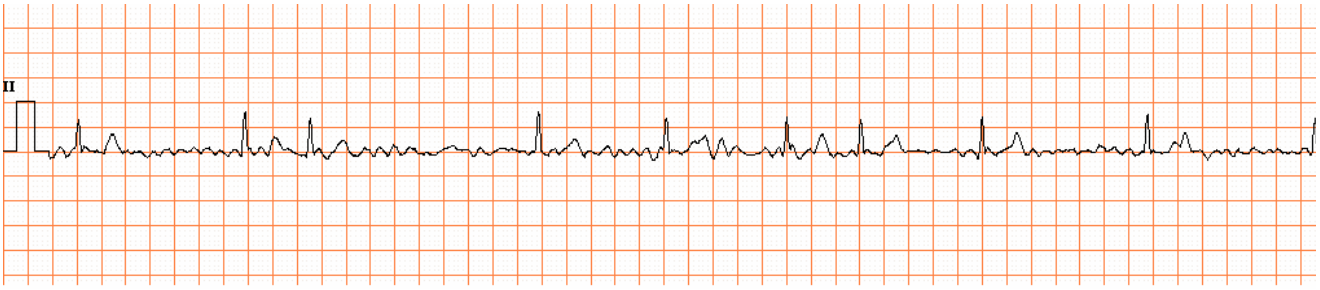
  - atrial or ventricular hypertrophy

  - ischaemia due to coronary heart disease.

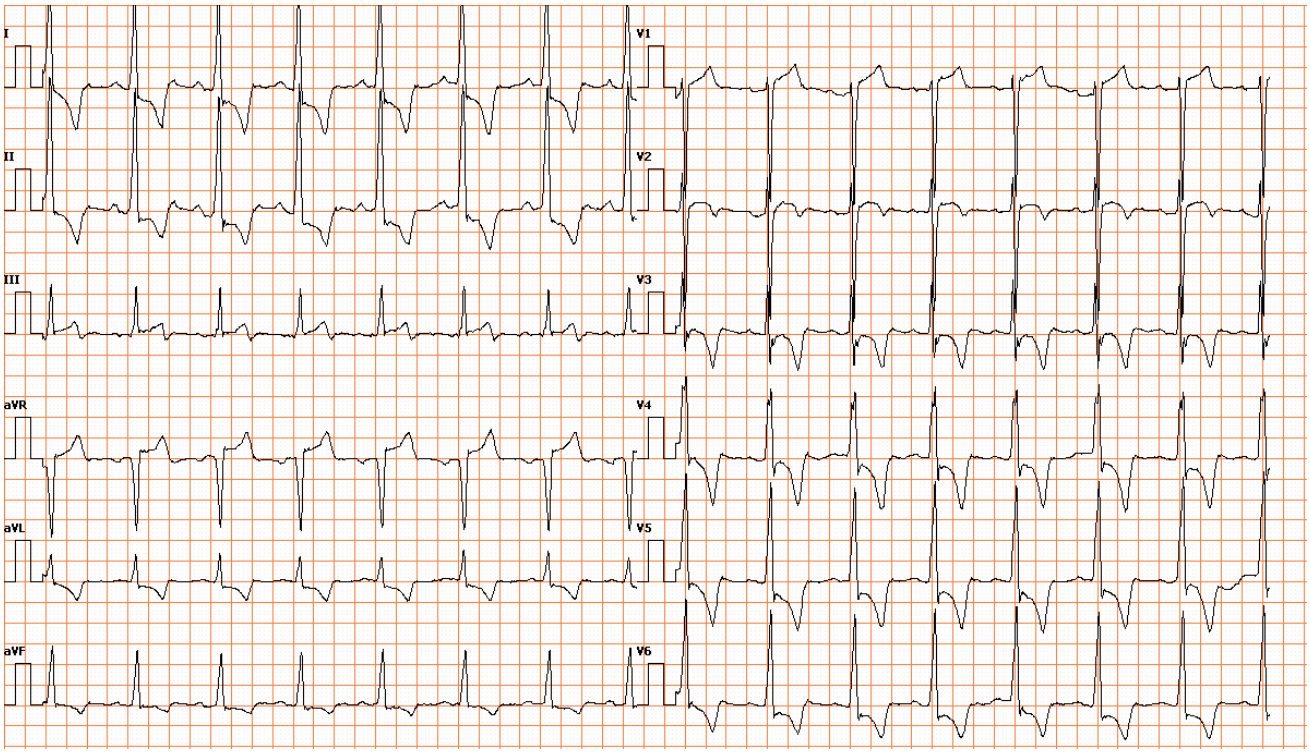
4. Typical ECG tracings



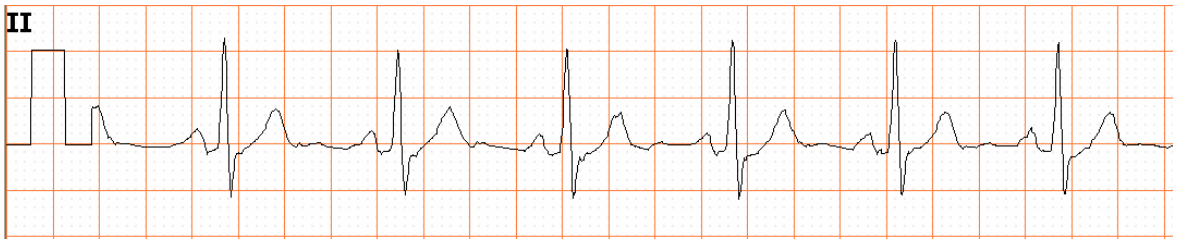
Normal tracing



Atrial fibrillation



Left ventricular hypertrophy with aortic failure



Wolf Parkinson White syndrome

(Short PR - broadened delta-QRS wave)

5. Discussion

Occupational physicians, especially those working in the building sector, are particularly well-placed to discover and monitor cardiovascular disease.

What would have been the outcome for the 3% of patients we urgently referred to their personal doctor, without performing a Télécardia© ECG examination?

They seemed well but in one, we even diagnosed Wolf Parkinson White syndrome; this patient had the accessory conduction pathway (Kent) ablated by radiofrequency current.
Another—in his fifth decade—was referred to a heart specialist with rare bigeminy.

Not to ignore a case of recurrent atrial fibrillation necessitating a major shift in therapeutic strategy.

We even recruited a neglected sequela of historical necrosis—in this case, tests are still underway.

These odd examples lead to a broader conclusion. It is not a question of asking the occupational physician to make heart problems a priority in his/her clinical practice but nevertheless, having the possibility of an ECG expands the scope of this potentially important public health player by going beyond the somewhat restrictive framework of simply assessing someone's capacity to go to work, and this despite the undeniable restrictions caused by ever-increasing "doctor time", above and beyond medical time.

Against this background, Télécardia© is ideally matched to 21st Century occupational health practice.

Compact, easy and quick to use, user-friendly, good reactivity in diagnostic aid and technical support: Télécardia© is the perfect electrocardiographic tool for occupational health specialists.

As has been pointed out, it is ideal for investigating suitability for certain occupations, the exercise of which entails, for obvious reasons, systematic ECG examinations at regular intervals. This, coupled with regular blood pressure monitoring, whatever the job concerned, should ensure the rapid detection of cardiovascular problems, the treatment of which will be of benefit to both employee and employer.

Still specialising in occupational health, the occupational physician can thus become a front-runner in the world of medico-economics.

6. Conclusion

Current Télécardia© technology gave satisfactory diagnoses in all forms of electrocardiographic disease.

Recommending its routine use by the medical profession, whether in emergencies or not, now seems reasonable with a view to **discovering cardiovascular disease earlier so that treatment can be instigated as soon as possible** while, at the same time, cutting down "doctor time".

"The occupational physician often encounters cardiovascular disease which remains one of the leading causes of morbidity.

A suspicious ECG warrants complementary interpretation by a specialist. If this practice is debatable when it comes to the population as a whole, it nevertheless seems prudent for those in high-risk jobs as well as all those of 40 and over.

*Practically all employees are subject to work-related stress which justifies specialised cardiovascular monitoring".**

** Taken from a publication by heart specialist and Professor of Occupational Health (Saint Jacques University Hospital, Clermont-Ferrand) Alain CHAMOUX and Doctor Agnès DOLCI: "Cardiovascular fitness for construction workers"*