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THE WHO GLOBAL PROGRAMME FOR THE PREVENTION OF RHEUMATIC FEVER AND RHEUMATIC HEART DISEASE

***Report of a Consultation to Review Progress
and Develop Future Activities
Geneva, 29 November - 1 December 1999***



World Health Organization
Organisation mondiale de la Santé

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I Introduction

Rheumatic fever/rheumatic heart disease (RF/RHD) is the most common cardiovascular disease in children and young adults and remains a major public health problem in developing countries. Currently, it affects an estimate of 12 million people world-wide. There are 400 000 deaths annually and hundreds of thousands of people disabled, mainly children and young adults. To date its occurrence is nil or very low in developed countries. In contrast, in developing countries and some countries in economic transition its occurrence is high with mortality rate up to 8.0 per 100 000 population, prevalence rate up to 10 per 1 000 school-age children and incidence up to 100 per 100 000 school-age children, with a high rate of recurrence, attack and severity. In most of these countries, more than 50% of RF/RHD patients are unaware of their disease and more than 70% do not receive monthly benzathine penicillin for secondary prophylaxis. Although an antistreptococcal vaccine remains the hope for the future, there is not yet sufficient evidence to suggest that a safe and effective Group A streptococcal vaccine will be available for mass immunization soon. However, there are methods of prevention which have been proved to be feasible and cost-effective in developing countries.¹⁻⁶

In 1984, The Cardiovascular Diseases Unit of WHO, in close collaboration with the World Heart Federation, formerly International Society and Federation of Cardiology (ISFC), initiated the WHO Global Programme for the Prevention of RF/RHD in Sixteen Developing Countries^a supported by the Arab Gulf Programme for United Nations Development Organizations (AGFUND). This is a service-oriented programme, integrated into the primary health care structure and facilities, based on secondary prevention of RF/RHD (case finding, registration, secondary prophylaxis, training health personnel and health education). The overall goal is to reduce morbidity, mortality and disability caused by RF/RHD through the establishment of at least one local/regional programme implementing RF/RHD prevention measures.

The programme was planned in three phases: Phase I - Pilot study: 1-2 years (testing the feasibility of the RF/RHD programme strategy in a selected area); Phase II - community control: 2-5 years (implementing the programme strategy in a selected community, region or province), and Phase III - nationwide control: 5-10 years (extension of activities towards nation-wide coverage).

This Consultation was organized to review the progress of the programme and develop future activities. The objectives of the Consultation were to:

1. Evaluate ongoing activities in the WHO Global Programme for Prevention and Control of RF/RHD.
2. Review the current progress report form and develop an updated method for progress reporting and evaluation of activities (document 1).
3. Develop updated guidelines for the development of national plans of action for the prevention and control of RF/RHD (document 2).
4. Plan future activities.

^a Mali, Zambia, Zimbabwe, Bolivia, El Salvador, Jamaica, Egypt, Iraq, Pakistan, Sudan, India, Sri Lanka, Thailand, P.R. of China, Philippines, Tonga

Dr A. Alwan, Director, Department of Noncommunicable Diseases, opened the meeting on behalf of Dr Jie Chen, Executive Director of the Noncommunicable Diseases Cluster. In his opening address, Dr Alwan emphasized the major problems impeding the development of effective programmes in most developing countries. These are mainly shortage of resources, lack of information, insufficient training of health personnel, and low level of health education among patients and population at risk.

He drew attention to the need to develop practical up-to-date recommendations to guide countries on the best use of feasible and cost-effective methods for control and prevention of rheumatic fever and rheumatic heart disease.

After his address, he invited Dr E.L. Kaplan to chair the meeting. Dr S. Zaher was elected Rapporteur. Dr Kaplan reviewed the provisional programme with the participants (Annexes I and II).

II Review of Activities of The WHO Global Programme for Prevention and Control of RF/RHD

I. *Progress report of the WHO programme in sixteen developing countries (AGFUND supported): January 1994 - December 1998, Dr Porfirio Nordest^b*

Despite financial difficulties in participating countries Phase I has been successfully completed in all centres^c. All countries are now in Phase II of the programme (continuing activities in the pilot area plus extending to a whole province, region, district, governorate or other). Five countries have started on Phase III, nation-wide coverage and primary prevention whenever feasible (Egypt, Jamaica, Pakistan, Philippines and Tonga). Unfortunately, in some participating countries, less than 20% of the population at risk is covered, since lack of resources has precluded extension beyond the second phase.

A total of 15 708 946 schoolchildren were screened, mainly through a multi-purpose and pre-class school survey, and 68 915 RF/RHD cases registered; this gave a gross prevalence of 4.3 per 1000, range between 0.1 and 12.6. The coverage rate of the monthly secondary prophylaxis, though irregular, averaged 63.2% with a range between 47.5 and 95.0, and a very small recurrence rate of acute RF(0.4%) and adverse reaction to benzathine penicillin (0.3%). Most countries have reported improvement in quality of care for RF/RHD patients from participating areas. All countries have reported financial difficulties and lack of resources.

In 1999, during site visits to Cuba, Egypt, and Sudan to evaluate the programme progress and effectiveness, a reduction in the number of new cases and recurrence attacks was observed, as well as a remarkable decrease in the amount and severity of heart valve damage (RHD) among patients and population in areas covered by the programme. As a result, there have been fewer deaths and disabled people, as well as a decrease in those requiring heart surgery (see the report on progress and evaluation of effectiveness).

Conclusions and Recommendations

- a) Case finding and compliance with secondary prophylaxis have markedly improved in most participating countries.
- b) Progressive extension of the programme to other areas of a country, within the primary health care system, is feasible.
- c) Most countries have had to limit programme implementation to the initial province/area.
- d) WHO should intensify efforts to encourage governmental and nongovernmental organizations to support the establishment of at least one specialized local/regional centre in all countries where RF/RHD is a problem.
- e) WHO should promote fund raising activities for at least partial financial support to countries with limited health resources where RF/RHD is a major problem.

^b Full texts are available from the WHO/CVD Programme, World Health Organization, Geneva

^c Bulletin of the WHO, 70(2): 213-218 (1992)

2. *Progress report of the Joint WHO/WHF Programme in 7 countries: January 1994 to December 1998. Dr Aloyzio Achutti and Dr Porfirio Nordet^b*

WHO/CVD Unit and the Ad Hoc Committee on RF/RHD of the ISFC worked in planning and development of the programme during 1991. Ministries of health and national societies of cardiology of 12 interested countries were invited to participate in the programme and a favourable reply was received from 7. (Benin, Cameroon, Brazil, Cuba, Romania, Indonesia, and Viet Nam).

The programme was planned like the AGFUND programme in three phases. The programme is based on secondary prevention (case finding, registration, secondary prophylaxis, training personnel and health education) and promotion of primary prevention activities (whenever feasible) through the primary health care system of each country under the responsibility of the Cardiology department or Cardiology Institute in close collaboration with the National Society of Cardiology, with a partial financial support from the WHF, formerly ISFC.

All countries are implementing Phase II of the programme (continuing activities in the pilot area plus extending to the whole province, region, district, or other) and primary prevention approach whenever feasible. Two countries, Cuba and Romania, have started implementation of Phase III, nation-wide coverage and primary prevention approach whenever feasible. Collaboration with cardiology departments and institutes and partial financial support from the WHF have assisted in the development of health education material and activities, training personnel and provision of reagents and drugs, mainly benzathine penicillin.

All countries have reported improvement in quality of care and better evolution for RF/RHD patients from participating areas. However, lack of resources has prevented extension beyond the second phase.

Conclusions and recommendations

- a) Case finding and secondary prophylaxis compliance have markedly improved in all countries;
- b) Progressive extension of the programme to other areas of a country, within the primary health care system, is feasible. However, financial difficulties have limited programme extension.
- c) Primary prevention activities should be encouraged whenever feasible.
- d) WHO and the ISFC should support programme managers in finding external funds;
- e) WHO and the ISFC should intensify their efforts to encourage governmental and nongovernmental organizations to support the establishment of at least one local/regional centre implementing RF/RHD prevention programme in all countries where RF/RHD is a problem.

3. *Reports from selected participating centres^b*

Progress reports were presented by Centre representatives from 5 participating Centres (China, Philippines, Jamaica, India, and Romania) and by Dr Porfirio Nordet for 3 Centres (Egypt, Sudan, Cuba) and by representatives from two WHO Regional Offices (AFRO and SEARO).

Most participating Centres have reported the following conclusions and recommendations:

- a) The programme has helped in the reduction of morbidity of RF and RHD (reduction in numbers of new cases and recurrent attacks, reduction in number of severe forms of RHD, and reduction in RHD-related mortality). RHD prevalences before and after implementation of the programme are shown in Table 1.
- b) There is a variability and confusion in the terms referring to definitions, diagnostic criteria, and epidemiologic data. It was recommended that standardization of the above reference terms be undertaken by the Consultation group. This will help appropriate interpretation, comparison, and analysis of reported data.
- c) The lack of funding may greatly affect the continuity of the programme in many countries.
- d) There was a consensus that WHO is required to support some programme related aspects such as the supply/manufacture of benzathine penicillin, supply of disposable syringes, supply of teaching and educational material, sponsor training sessions, and sponsor research activities in the community.

Table 1: RHD prevalences reported from participating Centres^b

Centre	RHD prevalence/1000 schoolchildren	
	Before programme	During/after programme
Cuba (Pinar del Rio Province) ⁹	2.3 (1986)	0.2 (1998)
Egypt (Cairo Governorat) ¹⁰	7.2 (average of 3 governorates outside programme area)	2.3 (1998)
Philippines (Laguna District, Manila) ¹¹	1.0 (1978)	1.0 (1997-98)
China (Panyu City, Guangdong Province) ¹²	0.8 (1986)	0.3 (1998)
India (Urban and rural area, Chandigarh) ¹³	3.0 (national average)	1.4
Romania (Bucharest)) ¹⁴		0.031 (1997) 0.027 (1998)

III Standardization of Definitions and Methods

An important task of the present Consultation has been to put standardized definitions in order to facilitate both adequate data collection and reporting, and valid evaluation of programme success. The group has agreed upon the following definitions to be used by all participating Centres:

Rheumatic Fever: A new (current) case with acute illness which fulfils the Jones Criteria (Revised, 1992) (with or without cardiac involvement).

Rheumatic Heart Disease: A new or old case without rheumatic activity with a valvular lesion confirmed either by reliable auscultation or by echocardiography. (See TRS # 764)

Past history of rheumatic fever: A case without a valvular lesion with a past history of documented rheumatic fever (confirmed) or a past history suggestive of rheumatic fever, but undocumented (not confirmed). (See TRS # 764)

Incidence of RF: Total number of new cases with rheumatic fever (with or without cardiac involvement) recorded in a period of one year per 100 000 of the specific population group, usually school-age children.

Prevalence of RF: Total number of old cases with a past history of documented RF (without a valvular lesion) and total number of new cases with RF (without cardiac involvement) per 1 000 in a selected area, period of time and specific population group, usually schoolchildren.

Prevalence of RHD: Total number of all cases with confirmed RHD and total number of new cases of RF with cardiac involvement per 1000 in a selected area, period of time and specific population group, usually schoolchildren.

Prevalence of RF/RHD: Total of prevalence of RHD plus prevalence of RF.

Group A streptococcal throat infections: Cases with throat illness and a positive culture for GAS (confirmed).

Compliance in prophylaxis: The patient who receives at least 90% of the long-acting benzathine penicillin (LAP) injections due per year is considered compliant. Otherwise, the patient is non-compliant⁷ Centre compliance is reported as the total number of compliant patients/the total number of patients registered percent.

Centre coverage: The total number of injections given in the Centre/the total number of injections due per month or per year.

IV Summary and Conclusions

1. One of the major factors contributing to the RF/RHD problem in developing countries is low socio-economic standards of living and poverty. These conditions contribute to the delay of diagnosis and adequate treatment and represent an impediment towards RF and RHD management and control. A shortage of high quality benzathine penicillin is an additional impediment.
2. It is essential that reference terms of definitions and diagnosis related to RF and RHD that are used in the programme be well standardized. All health workers involved in the programme should be able to clearly understand and interpret these terms. This is essential to facilitate adequacy of data collection and reporting and evaluation of programme progress.
3. Coordinated partnership between the UN organizations and nongovernmental organizations dealing with RF/RHD and streptococcal infection is imperative in order to adequately meet the challenges of both diseases and to promote continuity of the programme.
4. Communication and collaboration among WHO programmes, divisions, units dealing with various issues of RF and RHD is required, by setting up a single functionally integrated programme.⁸
5. There has been an emphasis on professional and lay health education as an important area for control of RF and RHD, especially in developing countries. Promotion of health education information and material to be adapted to the goals of the programme for use in different countries is strongly recommended. Sufficient and adequate training of health personnel is also important.
6. Because the clinical diagnosis of streptococcal pharyngitis remains imprecise, the diagnosis relies upon laboratory methods. However, clinical studies to provide appropriate clinical criteria for improving clinical diagnosis are required.
7. The information on RF/RHD in the TRS 764, 1988 *Rheumatic Fever and Rheumatic Heart Disease* is widely used for management and treatment of GABS infections and rheumatic fever in different regions of the world. However, because of the advances made over the past 10 years in diagnosis and management of both diseases, this information is outdated and needs to be modified.

V Recommendations

1. Coordinated efforts between different organizations and within WHO is urgently needed to improve the control of RF and RHD in developing countries.
2. Every effort should be undertaken to continue to implement the Phase III of the programme in participating countries. For this reason, coordination between the Programme Manager, the WHO Representative in participating countries and the Ministry of Health is imperative.
3. WHO is requested to call attention to the need for quality control of benzathine penicillin G, and to promote ways to make it more readily available at a more reasonable price. WHO should also contact UNICEF on this subject.
4. Health education and training of personnel should be strongly promoted within the programme activities.
5. Although it is not conceivable that a streptococcal vaccine can be used as a tool for primary prevention in the near future, this group urges WHO and the scientific community to intensify their efforts towards further research for developing a safe and effective antistreptococcal vaccine
6. Other recommended programme related research activities are:
 - Epidemiologic surveys of RF/HRD;
 - Study of the clinical criteria of strep throat diagnosis and development of clinical algorithm for diagnosis of streptococcal pharyngitis;
 - Appropriate diagnostic approaches of GABS infections;
 - Develop the RF/RHD country profile.
7. The WHO TRS Series No. 764 *Rheumatic fever/rheumatic heart disease* should be updated. The specific areas that should be reviewed and updated are:
 - Update epidemiologic statistics;
 - Update clinical diagnostic methods and the Jones Criteria;
 - The use of Doppler echocardiography in diagnosis;
 - Laboratory diagnosis of GABS infections;
 - Primary prevention approaches;
 - Treatment of acute RF and valvular disease;
 - Guidelines for bacterial endocarditis prophylaxis.

At the end of the meeting Dr Ingrid Martin, CVD Programme Coordinator, thanked all participants for their valuable contribution to the meeting and said that WHO was counting on their collaboration and assistance in the fulfillment of all recommendations.

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Annex II Programme

Monday 29 November 1999

- | | |
|--------------|--|
| 09.00 -10.00 | <p>Introduction</p> <ul style="list-style-type: none"> ▪ Opening address ▪ Presentation of participants ▪ Nomination of officers ▪ Presentation of the provisional programme |
| 10.00 -10.30 | <p>Review of activities in the WHO Global Programme for Prevention and Control of RF/RHD</p> <ul style="list-style-type: none"> ▪ Progress reports from: AGFUND (Porfirio Nordet)
WHF (P. Nordet, for Aloyzio Achutti) |
| 10.30 -10.45 | <i>Coffee break</i> |
| 10.45 -12.30 | <p>Review of activities in the WHO Global Programme for Prevention and Control of RF/RHD (contd.)</p> <ul style="list-style-type: none"> ▪ Reports from selected participating centres: <ul style="list-style-type: none"> China India Jamaica Philippines Romania Cuba, Egypt and Sudan AFRO SEARO ▪ Progress report from Joint WHO/WHF/UNESCO Task Force (Ed Kaplan) |
| 12.30 -14.00 | <i>Lunch</i> |
| 14.00 -15.30 | <p>Revision of recommendations for the development of national plans of action for the prevention and control of RF/RHD</p> <ul style="list-style-type: none"> ▪ Brief presentation of the second draft ▪ Contributions, analysis and discussion: <ul style="list-style-type: none"> Introduction Objectives Programme approaches Expected outcomes/results |
| 15.30 -15.45 | <i>Coffee break</i> |
| 15.45 -17.30 | <p>Contributions, analysis and discussion (contd)</p> <ul style="list-style-type: none"> ▪ Project design/Strategy & activities/Material & methods ▪ Programme approaches ▪ Programme implementation ▪ Work Plan table |

Tuesday 30 November

09.00 -10.30	Contributions, analysis and discussion (contd)
	<ul style="list-style-type: none">▪ Management▪ Resource requirements▪ Bacteriological and serological study
10.30 -10.45	<i>Coffee break</i>
10.45 -12.30	Contributions, analysis and discussion (contd)
	<ul style="list-style-type: none">▪ Updated information▪ Direct and indirect costs▪ Constraints and potential solutions
12.30 -14.00	<i>Lunch</i>
14.00 -15.30	Contributions, analysis and discussion (contd)
	<ul style="list-style-type: none">▪ School health and public health education
	Proposal for methodology for progress reporting and activity evaluation
	<ul style="list-style-type: none">▪ Presentation of the second draft and contributions▪ Analysis and discussion
15.30 -15.45	<i>Coffee break</i>
15.45 -17.30	Proposal for methodology for progress reporting and activity evaluation
	<ul style="list-style-type: none">▪ Analysis and discussion (contd)

Wednesday 1 December

09.00 -10.30	Presentation of the final drafts for:
	<ul style="list-style-type: none">▪ Revised methodology for progress reporting and evaluation of activities▪ Revised recommendations for the development of national plans of action for the prevention and control of RF/RHD
10.30 -10.45	<i>Coffee break</i>
10.45 -12.00	Future activities and recommendations:
	<ul style="list-style-type: none">▪ RF/RHD country profiles and RF/RHD global burden (Porfirio Nordet)▪ Update of TRS 764 Rheumatic Fever/Rheumatic Heart Disease (1988) (Ed Kaplan)▪ Streptococcal disease complex (Ed Kaplan)
12.00	Closure of the meeting

Appendix I

Recommendations for preparing a Plan of Action for Phase I (Pilot Study) and Phase II

WHO/WHF/UNESCO JOINT PROJECT ON RF/RHD PREVENTION IN SCHOOLCHILDREN

Country: _____

I. Introduction

Background

- Statement of the RF/RHD problem (worldwide, nationally) including:
 - Local situation analysis:
 - Health infrastructure
 - Relevant available health statistical
 - Educational infrastructure
 - Public health education efforts (Health promotion, school health education, health education, media participation, etc.)

Justification

WHO has consistently recommended that Governments should indicate their commitment to RF/RHD prevention programmes by appointing a national programme manager (or coordinator) and making budgetary provision for the programme. Such commitment should require that health planning units (or similar organizations), health policy makers and administrators are convinced and persuaded that RF/RHD prevention deserves the necessary priority, in the context of other pressing national health problems. The following points may help local advocacy for RF/RHD prevention:

- The public health implications, supported by the local situation situation analysis.
- Technology transfer:
 - Well-tried, simple, reliable and cost-effective methods exist that can be adapted and applied as a service-oriented, community based, RF/RHD programme in developing countries.
- Estimated cost of an acute RF patient and a RHD patient with and without surgical care
- Estimate cost-benefice of programme implementation in:
 - Decrease in expenditure for direct cost of RF/RHD care, including surgical care (US\$)
 - Indirect and invisible cost
 - Additional cost of local programme coordination

II Objectives

- *Overall goal:* To reduce morbidity, disability and mortality caused by RF/RHD and its complications. To reduce the occurrence and severity of Group A streptococcal infection and its suppurative and non-suppurative complications.
- *Short-term goal:* (Phase I) to plan and develop a service-oriented RF/RHD prevention programme in a defined area by the end of the year.
- *Medium-term goal:* (Phase II) to build on the experience gained after 1 year of Phase I and to develop similar RF/RHD prevention activities in other defined areas.
- *Long-term goal:* (Phase III) to extend programme activities in realistic stages towards eventual nationwide coverage, especially in large nations.

III Expected outcomes

- *Short-term:* significant reduction in the number of new and recurrent cases of RF (incidence), and significant in the total cases of severe RHD (prevalence)
- *Medium and long-term:* This reduction will produce a marked decrease in the number of RHD deaths and disabled young patients requiring repeated hospitalization and heart surgery - which is usually beyond their means. It will also alleviate the drain on already limited family and government resources.* In addition, there will be a permanent reduction in the occurrence and severity of Group A streptococcal infection, as well as its suppurative and non-suppurative complications in the community.

Extending programme activities gradually towards nation-wide coverage, applying locally appropriate methods and procedures. It is anticipated that the MOH of each country involved will timely take the necessary administrative steps to ensure the maintenance of the programme within the national health care system after external support has ended. Experience gained will serve to benefit other developing countries in developing RF/RHD prevention and for preventive health measure in general.

IV Project design (strategy and activities, material and methods)

The project is a service-oriented plan, to be implemented through the primary health care (PHC) structure and facilities of the national health system supported by the educational system, with the participation of schools, teachers, patients and their families, and the public. It involves primary and secondary prevention of RF/RHD, as well as training personnel, health education and low-cost effective technologies (see Diagram I.).

1. Programme approaches

- RF/RHD secondary prevention activities (case detection, registration, surveillance, follow-up and regular Benzathine penicillin injection for RF/RHD patients) aiming to prevent recurrence of acute RF and severe RHD;
- RF/RHD primary prevention activities (early detection, diagnosis and effective treatment for patients with Group A streptococcal pharyngitis);
- Promoting the health and well-being of schoolchildren;
- Development and/or enhancement of the school health infrastructure;
- Personnel training (local, national and international activities) and medical information;

- Health education, including health personnel, school-based health education, development of health education material and mass media input;
- Programme-related activities, including: Epidemiological surveillance, and Programme-related research

1.1 RF/RHD secondary prevention activities (see Diagram II and III)

- Case finding identification of active and inactive cases of RF and RHD from:
 - Screening surveys of school children (5 to 15 years of age), if any, are planned in the area (multi-purpose survey, pre-course medical screening, etc.).
 - Hospital retrospective case surveys, in (all) hospitals in the project area (for detection of RF/RHD patients discharged from the hospital to be sent to the Central Register).
 - Continuing detection of any RF/RHD patient (confirmed or suspected) from the hospital, polyclinic or any other source available, to be referred to the central/local register or referral centre.

Brief description of method and procedures.

- Registration
 - A central RF/RHD Register will either conduct the follow-up and secondary prophylaxis, as well as collect the standardized registration forms, or will only centralize the forms for those patients registered and treated in the local centres.
 - A Referral Centre should be established in the hospital, to confirm the suspected RF/RHD cases referred to it. The patients will then be recorded on the Central Register and forwarded to his/her local centre. [The WHO criteria for diagnosis is outlined in the WHO Technical Report Series 764, pp. 18-21 and 48 -58, 1988 and WHO Document WHO/CVD 94.1, 1994.] Annex II.
- Surveillance and follow-up

The surveillance and follow-up of the patients can be carried out in: the out-patient service of the pediatric hospital, a polyclinic, a health centre, a family doctor's practice, a school health service, etc. However, reports should be sent every 6 months to the Programme's Central Register; approximately once a year, a staff member from the Programme Registration Centre should visit the Health Unit where surveillance and follow-up is performed. The medical follow-up consultation should implement the following steps:

- Receive the RF/RHD patients from the Registration Centre.
- Keep a card index or a diary with names and scheduled appointments for Secondary Penicillin prophylaxis.
- Administer secondary prophylaxis.
- Detect non-compliant patients.
- Implement action for drop-out and non-compliance cases (telephone call, letter, home visit, etc).

Brief description of methods and procedures.

- Provide opportunity for long-term follow up and medical care
- Recommend appropriate cardiologic and surgical referral.

- Secondary prophylaxis
 - The secondary prophylaxis scheme is outlined in WHO/EDM/PAR/99.1 (Annex II).
- Prevention of Infective Endocarditis (IE).
 - Infective endocarditis remains a major threat to any patient with RHD. Therefore, patients, their relatives, teachers, dentists and physicians must be informed about its preventive strategy and the importance of recognizing its early symptoms. Antibiotic prophylaxis should be given according to current recommendations.
- Bacteriological and serological study of GABHS.
 - Laboratory tests (culture, rapid Strep-test, streptococcal antibody test) should be conducted in all cases of acute RF/RHD, and in all registered and followed-up patients, when indicated.
 - Bacteriological test (culture, rapid Strep-test,) should be conducted in all cases of suspected strep-throat patients, when indicated.

1.2 Primary prevention activities (see Diagram IV)

- Case finding (detection of streptococcal pharyngitis/strep-throat among school-age children) from polyclinics and health centres, emergency and outpatient services of hospitals, private and family doctors, schools (early detection and referral), other.
- Early and correct diagnosis (apply the clinical and/or bacteriological diagnosis criteria for streptococcal pharyngitis, outlined in the PAHO Scientific Pub. No 399, pp. 49, 1985, WHO Technical Report Series 764, pp. 30-31, 1988 and WHO Document WHO/CVD 94.1, 1994). Annex II.
- Provide effective and early treatment for patients with streptococcal pharyngitis (provide therapy according to the primary prophylaxis scheme outlined in WHO/EDM/PAR/99.1 (Annex II)).
- Develop the study and control of any suspected outbreak of Group A Beta haemolytic streptococcal (GABHS) infection.

1.3 Promoting the health and well-being of school children

Development and/or improvement of the comprehensive school health infrastructure (school health education and promotion) in the project area:

- Integrating prevention of respiratory infections and RF/RHD into the school curriculum and into school health services (if they exist).
- Making available relevant educational materials on health prevention and promotion relevant to local needs.
- The purpose of health education at schools should be to increase awareness on primary prevention.
- Health education should be integrated with the national health education curriculum at schools.
- Health education and educational material should be adapted to the health service facilities and made available for each particular area/region/country.

(Brief description of methods and procedures)

1.4. Personnel training (local, national and international activities) and medical information

- The training of physicians, nurses, primary health care workers (PHC) and other non-medical personnel participating in the programme can be carried out through local/regional workshops, seminars or continuing health education courses and, whenever possible, a developed curriculum should be provided with health education and informational materials and, as necessary, specific recommendations.
- The programme Manager (PM) and other members of the Programme Advisory Committee (PAC) should be responsible for this, through:
 - Local seminars/workshops (twice a year in the selected province/region).
 - Unit seminars/continuing education course (three times a year in each participating unit).
- The objective of these training activities is:
 - To train physicians, paramedical and non-medical personnel in specific activities of the programme such as organization, diagnosis and therapeutic criteria, preventive measures, health promotion, etc.
- Dissemination of medical information
 - The PM and other members of the PAC should elaborate and/or disseminate medical information such as: the protocol, recommendations, medical information, health education materials, etc. to local units and/or personnel participating in the programme.
- Specific training activities for teachers and other school staff
 - The Ministry of Education, in collaboration with the programme manager, should encourage training opportunities for school personnel on relevant health matters. This can include local/school/seminars/ workshops (e.g., at least once a year in the selected province/region), continuing education courses, etc. The objectives of these activities would be to train teachers and school staff in specific programme areas including motivating teachers and staff as role models for health prevention and promotion.
 - Whenever possible, the participants should be provided with health education materials, specific recommendations and documentation on the subject, which should also be available in libraries.

Brief description of methods and procedures.

1.5. *Health education (school-based and development of health education material and mass media input)*

Public health education can be organized by doctors, nurses or teachers for patients, their parents and guardians, school-age children and the general public, using lectures, health education sessions, the media (radio, TV, newsletters), posters in schools, health centres and public places. Booklets and leaflets can be adapted to the socio-cultural and linguistic needs and distributed widely. Patient support groups should also be encouraged.

Teachers can play an important role at the school-level by providing relevant information and health education to pupils and their families, etc.

Brief description of methods and procedures.

1.6 Programme-related activities (including epidemiological surveillance, programme related research)

These activities will provide information on the magnitude and characteristics of the problem and evaluate the trend, progress of the programme, outcomes, cost-effectiveness and procedures.

- Epidemiological surveillance of RF/RHD and streptococcal pharyngitis. Establishment of an appropriate information system. This may use different sources, according to the available statistical information of participating centres and countries:
 - National/regional vital statistic report
 - Local surveillance system report
 - Programme-related research
 - Annual programme progress report
 - Analysis of registered cases

Select specific activities and draft a brief description of methods and procedures for each one.

- Programme-related research (whenever possible)¹:

- Develop a permanent acute RF/RHD Register in the selected areas of the country to determine the incidence and characteristics (clinical, epidemiological and therapeutic of acute patients) and relation with clinical or bacteriological strep-throat.
- Develop a prevalence study of RF/RHD and streptococcal pharyngitis among school children in the selected area and, over time (at least at the beginning and end of the study) to assess the prevalence and characteristics (clinical, epidemiological, bacteriological and serological).
- Develop a clinical, epidemiological, bacteriological and therapeutic study of children with acute pharyngitis (at least at the beginning and end of the study). To determine morbidity associated with streptococcal pharyngitis and characteristics (*whenever feasible*).
- Record significant concurrent illnesses (e.g. sickle cell disease, rheumatoid arthritis).

2. Programme implementation (see Diagram V)

The main implementation activities can be inferred from the Programme Approaches (Section 3) and Functions of the Programme Centre (Section 3.2). The practical details of what is done, where and when, are matters that can only be decided locally: e.g. in addition to the Central Registry, satellite registration centres may be established for the convenience of patients, if suitable facilities are available for regular prophylaxis and follow up at the periphery.

¹ WHO will assist participating countries and interested institutions in planning specific protocols based upon accepted principles for the development of programme-related research. This will enable us to receive reliable and comparable data on the magnitude of the RF/RHD problem.

Timetable for the programme implementation

Activities	Duration
Project planning and development	6/12 months
Project implementation for Phase I (pilot study) ²	1 to 2 Years
Project implementation for Phase II	3 to 4 years
Project implementation for Phase III	5 to 10 years

3. Description of the target area for Phase I of the project

- Project site location (e.g., city, community, etc.) and selection criteria.
- Demographic profile - national and in project area - with special attention given to the population of school-age children (5-15 years of age).
- Health infrastructure in project area including availability of human resources, capabilities and health facilities such as pediatric hospitals, polyclinics, health centres, etc.
- Educational infrastructure in the project area including the number of primary and secondary schools, enrolment rates by level of education primary, secondary availability of school health services, school and classroom environmental conditions.

4. Work plan table

Complete a work plan table for the specific activities planned for the year (Annex II).

V Management

The responsibility of the ministries varies from country to another. Below are examples for suggested roles of the involved ministries and some strategies for the administrative structure:

1. The Ministry of Health is ultimately responsible for overall management and:

- appoints the responsible institution, the national programme Manager (PM), the members of the Programme Advisory Committee (PAC),
- selects the initial project site and participating institutions.
- Selects the initial programme site and participating health institutions;
- Liaises with the Ministry of Education to identify participation of schools.

² Pilot study, in order to develop and test locally appropriate methods and procedure for the implementation of the programme.

2. The Ministry of Education (MOE) assumes responsibility for the educational aspects of the programme at school level and is to:

- designate a responsible officer for this aspect of the programme
- cooperate with the Ministry of Health to incorporate recommended approaches to RF/RHD prevention as a regular and integral part of the general Health Promotion and Education programme offered in schools and
- help facilitate the development and implementation of a school-based programme of primary and secondary prevention of RF/RHD in school children.

3. Administrative structure

3.1 Programme Manager and Centre

The choice of the PM and the Centre are largely influenced by local circumstances and procedures. Usually, the PM is a pediatrician and the centre is conveniently located in the same hospital.

- The PM, assisted by individual members of the PAC, prepares the plan of operation and coordinates the activities of the programme.
- He appoints a small Operational Committee of key personnel responsible for the implementation of important aspects of the programme. The Operational Committee assists with progress evaluation, logistic and other operational difficulties and with the general coordination of the programme. It should meet regularly and at frequent intervals to discharge these duties.

3.2 The Programme Advisory Committee (PAC)

This is a broad based multi-disciplinary committee to advise the PM and help with the general promotion of the programme. The size of the PAC need not be unwieldy, provided additional experts can be consulted as required. Representative of key departments: paediatrics, cardiology, primary health care, hospital care, epidemiology, microbiology lab, Ministry of Education).

• Key Responsibilities:

- Responsible centre (e.g., hospital, research institute, university _____).
- Programme Manager (PM). _____
- Multi-disciplinary PAC

• Programme centre's functions (local/regional/community level):

- To manage the Central Register, the primary and secondary prevention activities, as well as to assist participating schools in the development and/or improvement of school health activities.
- To promote cooperation between the participating staff, schools, hospitals and laboratories.
- To plan and coordinate activities to carry out the programme approaches.
- To meet regularly with the multi-disciplinary PAC.
- To evaluate the methods of work.
- To analyze the cost of the programme.
- To submit periodic progress reports.
- The National Society of Cardiology and Heart Foundation will assist and support the implementation of the project.

- The MOE-O will work in close collaboration with the PM and will be responsible for coordinating the implementation of all activities in participating schools including fostering cooperation between local health personnel and educational staff, training and school health activities.
- The PM and the MOE-O will select one representative for each participating health unit/school and promote their close collaboration.

Brief description of methods and procedures.

4. *Evaluation, Monitoring and Reporting*

The programme will be monitored and regularly evaluated by the national programme manager and the PAC.

It is essential that there be an evaluation of the programme in order to assess its effectiveness. It would be useful to obtain certain baseline data, for example:

- Initial incidence/prevalence data;
- Retrospective hospital surveys;
- Prophylaxis status before the programme;
- Educational programmes in the area;
- Coverage rates of secondary prophylaxis.

These evaluations can be repeated at intervals to evaluate the success of the programme.

VI Resource requirements

1 *Local inputs*

- The programme will be integrated into the already established infrastructure, equipment and facilities, including staff of the Ministries of Health and Education units involved in the programme.
- Additional local budget will be needed for contribution on:
 - Local coordination (+/- one person/month)
 - Equipment and supplies, (disposable syringes), reagents
 - Drugs, mainly B. Penicillin
 - Stationery (record forms etc.)
 - Training personnel (local)
 - Health education activities

- The PM and PAC will develop funds raising activities with local and external institutions, NGOs and potential donors for financial support and/or equipment, supplies and drugs, mainly B. Penicillin.

2. *External inputs*

- Building, coordination and technical input: WHO and its partners will contribute in technical support for planning, development and programme implementation. - Meeting, site-visit, development of training and health education material- and, -dispatch of experts for training personnel and programme evaluation-

- WHO and its partners will also develop fund raising activities for partial financial support of participating countries.

Examples:**Budget requirements, 1995-2000 (budget for building and coordinating the project)**

Subject	Participants	Cost
1. Task Force/Steering Committee for coordinating project activities (January-June)	$3^3 + 0\ 2$?
2. First meeting of programme managers (PM) and pilot international workshop (after the first year of implementation (1996-97)	$3 + 5/10\ PM$?
3. Site visit for coordination, training and evaluation (whenever feasible, 1995-96)	1 for 5/10	?
4. Second meeting of programme managers for evaluation of pilot study (1998-2000)	$3 + 5/10\ PM$?

Budget for resources requirement for project implementation ((per country/year)

Resources	External inputs ⁴	Internal/local inputs
Staff	NO	_____
Drugs/mainly B. Penicillin	2 000	_____
Equipment and supplies, reagents	2 000	_____
Stationery (record forms etc.)	500	_____
Training personnel ⁵	2 000	_____
Health education ⁶	2 000	_____
Miscellaneous including transport	500	_____
Partial support for programme-related research ..	1 000	_____
Total	10 000	_____

³ One representative each from WHF, UNESCO and WHO⁴ The figures are based on a single module covering a population of 100,000 inhabitants per country.⁵ Training personnel: national/local/units seminars, workshops and lectures for health personnel and teachers.⁶ Health education: school health (educational material & equipment to support school intervention activities), school-aged children, youth, relatives and the general public (lectures, group health education session, the media (radio, TV, newsletters), posters, booklets, leaflets, etc.

Sources

WHO Technical Report Series, No. 732 (1986); 764 (1988)

Dodu, S.R.A. and Bothig, S. RF/RHD in Developing Countries. World Health forum Vol. 10, 1989, p. 205-206

WHO Technical Report Series No. 764, pps 23-25

WHO Health for All Series No. 6 (1981), Health Programme Evaluation - Guiding Principles.

WHO/EDM/PAR

RMS form for fund raising and RF/RHD application to Gates Foundation.

Bangladesh application to the E.C. (Project Presentation)

Silas Dodu W.P. contribution to Consultation on Recommendations

First draft for the Guidelines 1995

Annex I: Diagrams

Diagram I: National Programme for the Prevention & Control of Rheumatic Fever/Rheumatic Heart Disease

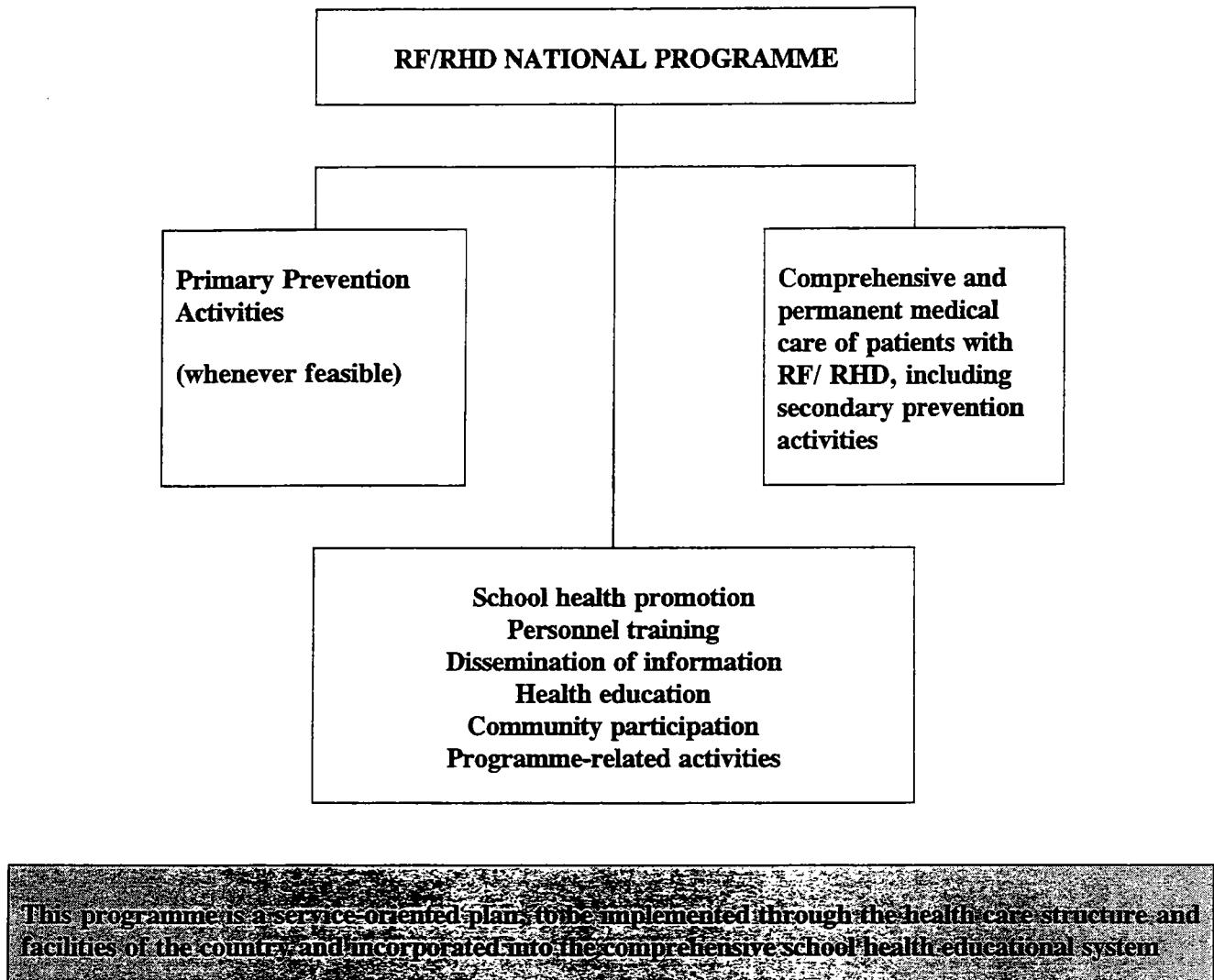


Diagram II: Comprehensive and permanent medical care of patients with RF/RHD

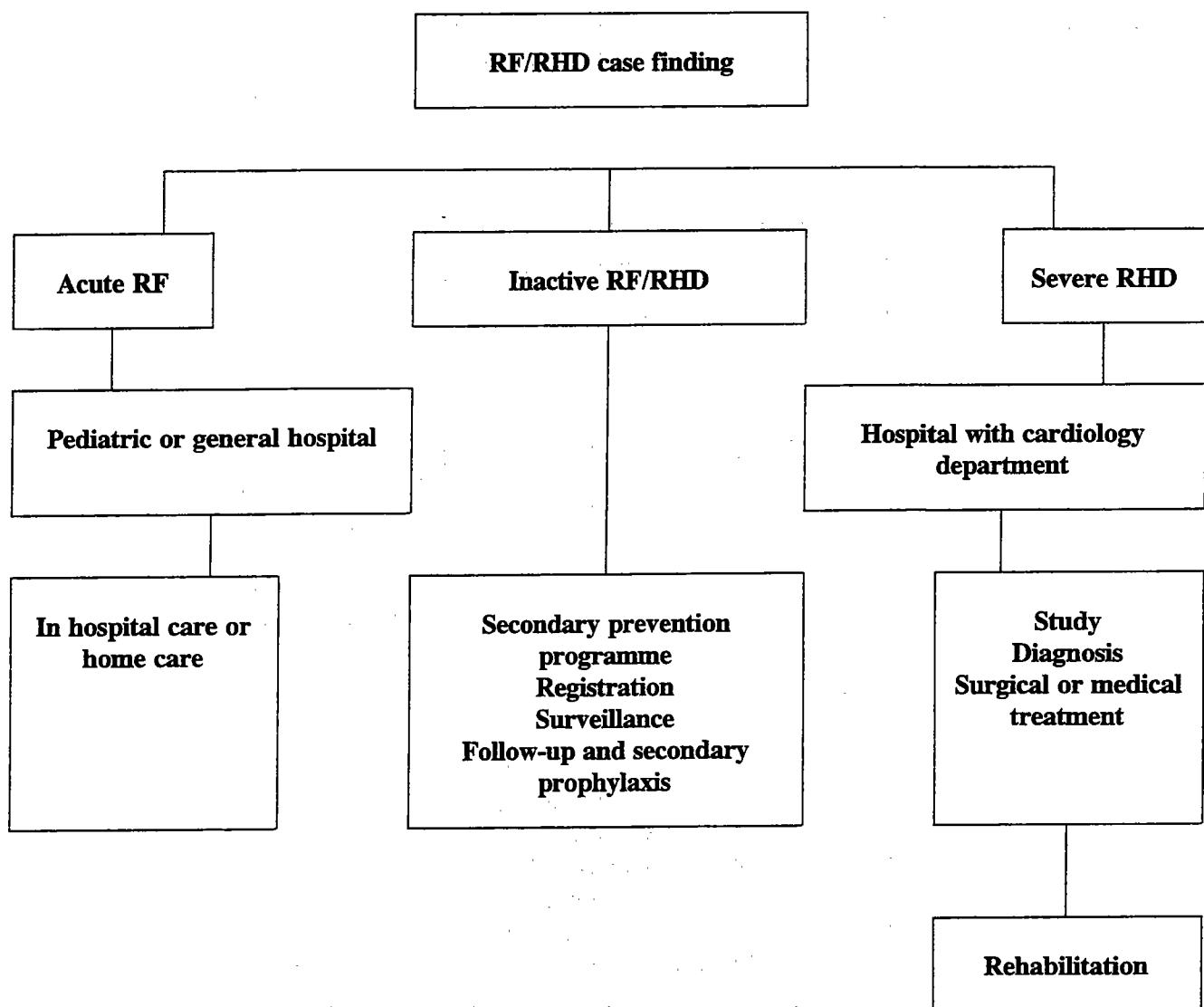
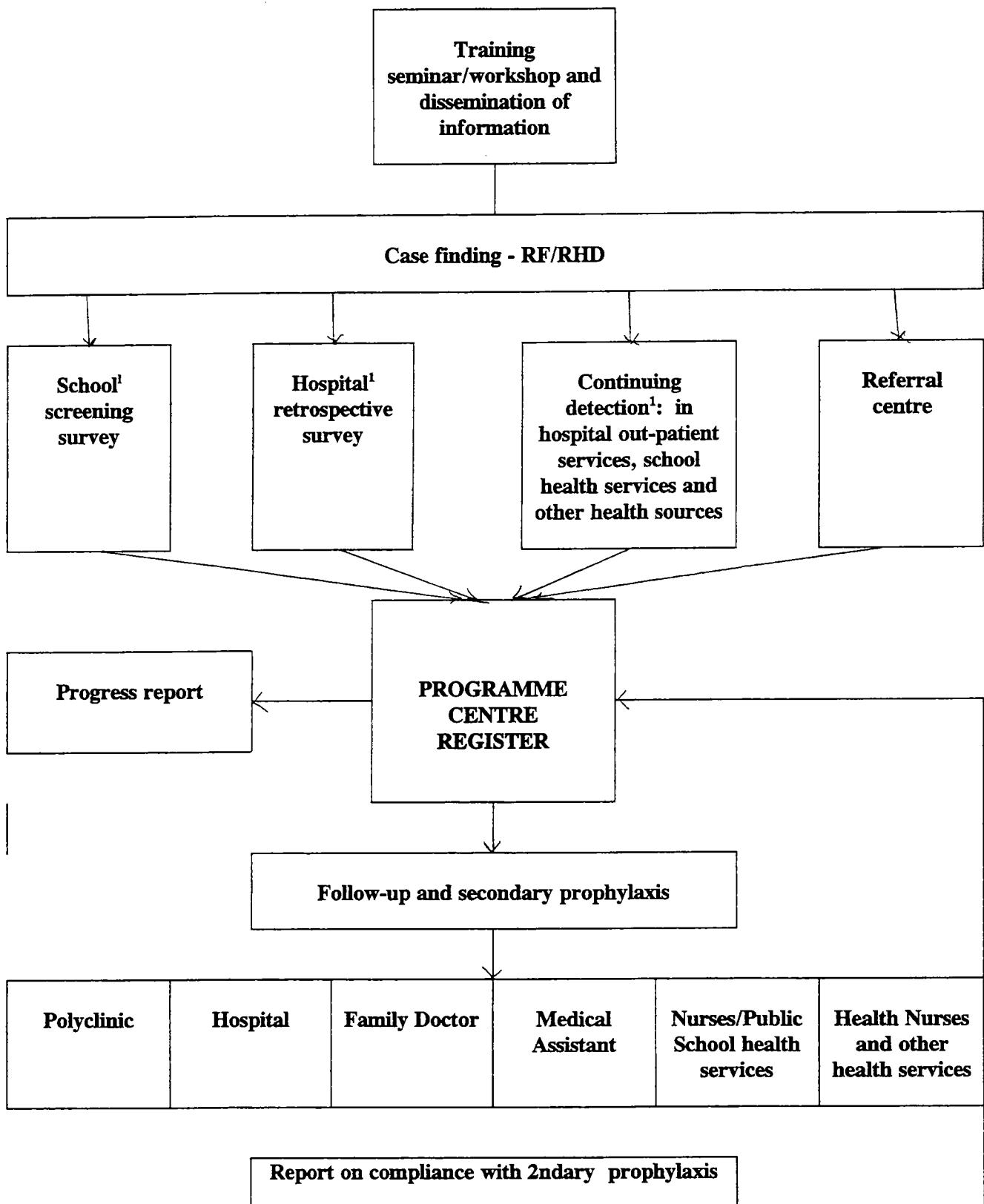


Diagram III: Secondary prevention



¹ All the suspected RF/RHD patients should be sent to the referral centre.

Diagram IV: Primary prevention activities

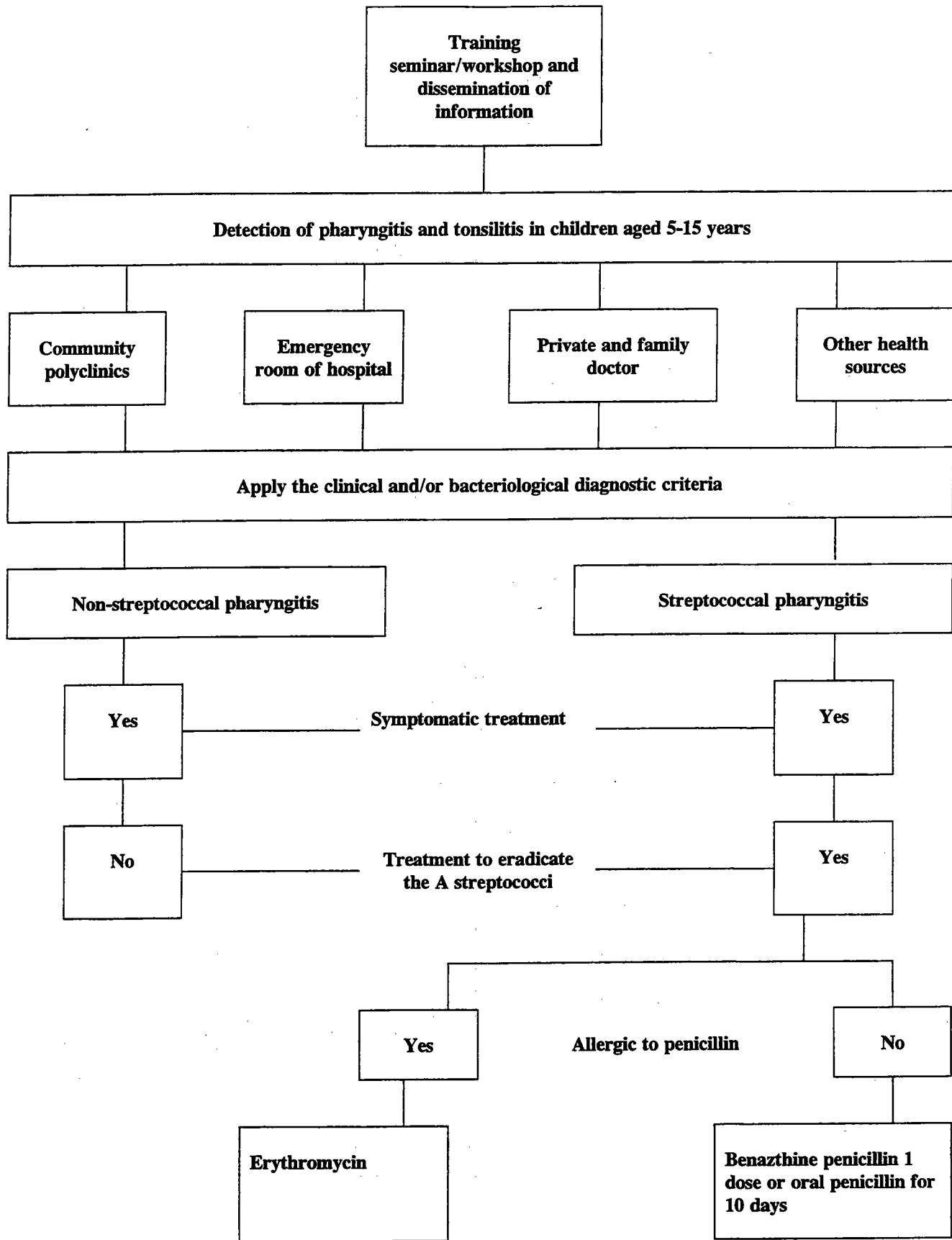
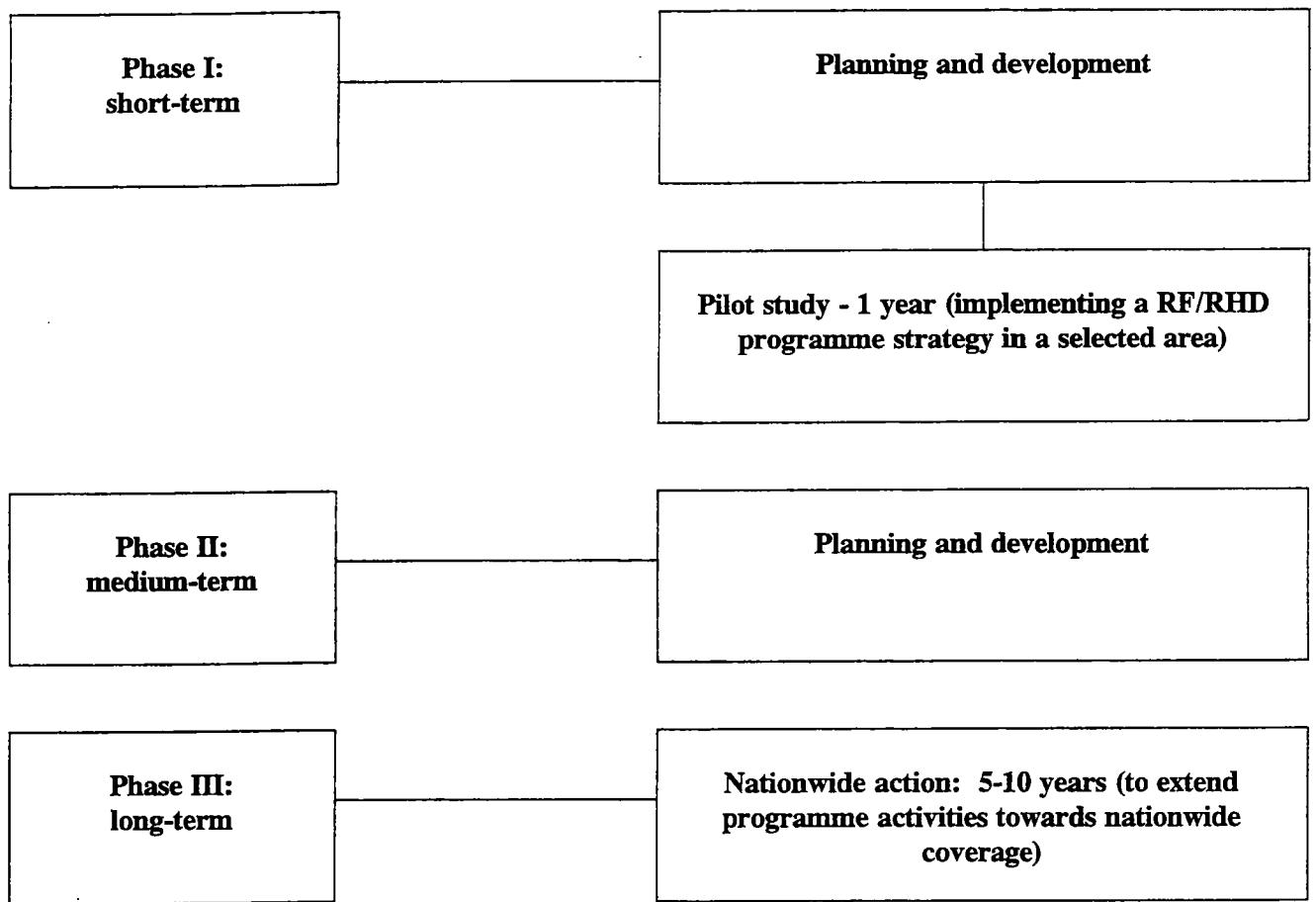


Diagram V: Programme implementation



Annex II: Appendices

I: Jones criteria (revised) for guidance in the diagnosis of acute rheumatic fever

Major manifestations	Minor manifestations
Carditis	<i>Clinical</i>
Polyarthritis	Fever
Chorea	Arthralgia
Erythema marginatum	Previous rheumatic fever or rheumatic heart disease
Subcutaneous nodules	<i>Laboratory</i>
	Acute-phase reactions: abnormal erythrocyte sedimentation rate. C-reactive protein, leukocytosis
	Prolonged P-R interval

The presence of two major, or one major and two minor, manifestations *plus* evidence of a preceding streptococcal infection indicates a high probability of rheumatic fever. Previous infection is indicated by: increased antistreptolysin O or other streptococcal antibody; positive throat culture for group A streptococcus; recent scarlet fever. Manifestations with a long latent period, such as chorea and late-onset carditis, are exempted from this last requirement.

Note: The above is the recommendation of the American Heart Association (47). It has been approved by the WHO Study Group, with the proviso that the following rheumatic fever entities be dealt with separately and be exempted from fulfilling the Jones criteria: "pure" chorea, late-onset carditis and rheumatic recurrence (see text for details).

Source: WHO TRS No. 764, 1988, page 20.

II: Tables concerning administration of treatment and prevention of RF/RHD

Table 1. Treatment of Group A Streptococcal Pharyngitis (Primary Prevention of Rheumatic Fever).

Antibiotic	Route	Dose	Duration of Rx
For non penicillin allergic patients: Benzathine benzylpenicillin	IM	< 30 kg 600,000 IU > 30 kg 1,200,000 IU	A single injection
Phenoxymethylenicillin	Oral	< 30 kg 250 mg 2 or 3 times daily > 30 kg, 500 mg 2 or 3 times daily	10 days
For penicillin allergic patients: Erythromycin ethylsuccinate Erythromycin estolate	Oral	40 mg/kg/day (max. 1.5 g/day) 3 times daily 20-40 mg/kg/day (max. 1.5 g/day) 3 times daily	10 days

Comments:

1. Oral ampicillin or amoxicillin has been used. They must be given for 10 days
2. Oral cefalosporins (first or second generation) are also effective but usually are more expensive.
3. Newer orally administered macrolides have been reported to be effective in eradicating group A streptococci when given for less than 10 days. At this time data are not sufficiently conclusive to support unqualified recommendation for a shortened course of therapy.
4. Mixtures of benzathine benzylpenicillin with procaine benzylpenicillin G have been used. The mixture tends to cause less discomfort, but doses mixture tends to cause less discomfort, but doses benzathine benzylpenicillin in the mixture.
5. Sulfonamides or tetracycline are not acceptable therapy for group A streptococcal pharyngitis.

Source: WHO Model Prescribing Information: Treatment of Streptococcal pharyngitis and Prevention of RF/RHD, WHO/EDM/PAR/99.1

Table 2. Prevention of Recurrences of Rheumatic Fever by Prevention of Group A Streptococcal Infections in Individuals who have had an initial attack of Rheumatic Fever (Secondary Prophylaxis).

Antibiotic	Route	Dose
Benzathine benzylpenicillin	IM	For children <30 kg: 600,000 IU every 3-4 weeks For children ≥ 30 kg and adults: 1,200,000 IU every 3-4 weeks
Phenoxymethylenicillin	Oral	250 mg 2 times daily
Sulfonamide (e.g. sulfadiazine, sulfadoxine or equivalent)	Oral	< 30 kg 500 mg daily > 30 kg 1.0 g daily

Comments:

1. Studies have shown injections of benzathine benzylpenicillin every three weeks are superior to every four weeks in preventing recurrences in those individuals considered to be at high risk of recurrence of rheumatic fever.
2. Sulfonamides are contraindicated in the third trimester of pregnancy because of transplacental passage of the drugs and potential competition with bilirubin for albumin-binding sites.
3. Erythromycin, although not studied for secondary prophylaxis, may be used for individuals who can not take either penicillin or a sulfonamide.
4. It should be remembered that patients are susceptible to recurrences even after surgery for rheumatic heart disease and secondary prophylaxis should be continued (see text). This is different from prophylaxis for prevention of infective endocarditis.

*The general principles for secondary prophylaxis are :

Patient	Duration
No carditis/RHD	To 18 years and at least five years after the last attack
Documented carditis	At least to 25 years and often longer
Chronic carditis	For life
With artificial valves	For life

III: Some clinical characteristics of the "strep" throat compared with those of a non-strep throat (usually viral infection)

CLINICAL CHARACTERISTICS	STREP THROAT	OTHER ETIOLOGIC AGENTS
AGE	5-15 years (most common)	All ages
MODE OF ONSET	Sudden ¹	More gradually
INITIAL SYMPTOMS	Sore throat with pain while swallowing	Mild sore throat
FEVER	High (usually greater than 38°)	Not so high (usually less than 38°)
APPEARANCE OF THE THROAT	Redness, hyperemia, oedema and exudate (yellow flecks) of the Pharynx ¹ Enlargement of the tonsils with exudate ¹ Hyperemia, oedema and punctate hemorrhages in the soft palate ¹	Redness of the pharynx Ulcerations
OTHER SIGNS	Tenderness of the anterior cervical lymph nodes ¹ Scabby erosions on the edges of the nostrils ¹ Clinical picture of scarlet fever ^{3,1}	Cough ² Hoarseness ² Watery nasal Secretion ² Conjunctivitis ²

1 Characteristics manifestation of a "strep" throat

2 Non-characteristic manifestation of a "strep" throat

3 Red strawberry tongue, cutaneous eruption particularly on the throat, chest, axillae, elbows, groins and in the inner surface of the thighs

The recent onset of the characteristic clinical picture with some of the frequent characteristic manifestations of a "strep" throat and none of the non-strep throat manifestations makes a clinical diagnosis of streptococcal pharyngitis or tonsilitis likely.

Source: WHO document WHO/CVD/94.1, Geneva, 1994

IV: Work plan table

Objective	Activities	Inputs	Planned dates	Responsible Officer	Expected results	Budget	Risks/Concerns

Annex III: Examples of forms to be used

RHEUMATIC FEVER/RHEUMATIC HEART DISEASE PREVENTION PROGRAMME

Referral form

Referring distribution:

School Health Service: Health Centre: Hospital:

Name of patient	Date of referral		
Address	day	month	year
Identification number			
Present school	Centre for prophylaxis (if required)		
Sex: Male <input type="checkbox"/> Female <input type="checkbox"/> day month year			
Date of birth: <input type="text"/> <input type="text"/> <input type="text"/>			

	Intensity				Site of Max. intensity			
	Faint	Mod.	Loud	Very loud	Apical	Mid-precord	Pulm.	Aortic
Systolic	<input type="checkbox"/>							
Diastolic								

INITIAL REGISTRATION FORM

Country _____ Province _____ City _____

Program Center (4 to 5)

Registration No. (6 to 9)

Name of patient _____

Address _____

School (12 to 13)

Sex: 1 = Male
2 = Female (14)

Year of birth (15 to 16)

Date of registration (17 to 22)
day month year

Age _____ years old

Source of notification to the registry (23)

1 = Hospital inpatient department
2 = Hospital outpatient clinic
3 = Private physician

4 = Laboratory
5 = School health service
6 = Mass examination

7 = Outlying clinic
8 = Other

Section I. Active rheumatic fever: 1 = positive; 2 = suspected; 3 = negative; 4 = not determined.

(24) Diagnosis

Major manifestations

(25) carditis

(26) polyarthritis

(27) chorea

(28) erythema marginatum

(29) subcutaneous nodules

Minor manifestations

(30) joint pain

(31) high temperature

(32) history of rheumatic fever

(33) previous chronic rheumatic cardiopathy

(34) positive C-reactive protein test or increase in sedimentation rate

(35) increase in the PR interval (ECG)

(36) previous infection by beta-hemolytic streptococci

(37) initial attack (1 = yes; 2 = no; 3 = not known)

(38) NYHA Functional Classification 1-I, 2-II, 3-III, 4-IV, 5- Not applicable

Section II. Chronic rheumatic cardiopathy: 1 = positive; 2 = suspected; 3 = negative.

(39) diagnosis

(43) aortic stenosis

(40) mitral stenosis

(44) organic lesion of the tricuspid valve

(41) aortic insufficiency

(45) heart failure

(42) mitral insufficiency

(46 to 47) year of initial attack

(50) number of recurrences

1 = one; 2 = two; 3 = three or more;

4 = not known; 5 = none; 6 = initial attack.

(51) preventive regimen in previous year

Pentetate

- | | |
|------------------------------|---------------------|
| 1 = regular intramuscular | 5 = salphazides |
| 2 = irregular intramuscular | 6 = erythromycin |
| 3 = occasional intramuscular | 7 = myc combination |
| 4 = oral | 8 = initial attack |

(52) Socio-economic group 1- High, 2- Middle, 3- Low 4- Unknown

9 = none

(53) Source of information _____

Address: _____ Telephone No.: _____

Modified from PAHO S.Publ. No 399, 1985

ANNUAL FOLLOW-UP FORM

Collaborative Study on the Prevention of Rheumatic Fever

Program Center (4 to 5)

Registration No. (6 to 9)

Name of patient _____

Address (10 to 11) _____ School (12 to 13) _____

Date of attendance (14 to 19) day month year

(20) Follow-up

- 1 = Lives in the area
2 = Has moved from the area
3 = Deceased
4 = Not located

- 5 = Taken off register (state why) _____

Type of preventive treatment: 1 = Yes; 2 = No; 3 = Not known

(21) Intramuscular penicillin

- (22) January (23) February (24) March (25) April
 (26) May (27) June (28) July (29) August
 (30) September (31) October (32) November (33) December

(34) Penicillin by mouth

(35) Other (specify) _____

(36) Reason why prevention was not carried out:

- 0 = Is not applicable
1 = Patient dropped out
2 = Physician's order (specify) _____
3 = Other (specify) _____

(37) Streptococcal pharyngitis since the last registration

1 = one; 2 = two or more; 3 = suspected; 4 = none; 5 = not known.

(38) Attack of active rheumatic fever since the last registration

1 = one; 2 = two or more; 3 = suspected; 4 = none; 5 = not known.

Present diagnosis: 1 = positive; 2 = suspected; 3 = negative; 4 = not known.

(39) Acute rheumatic fever

(40) Mitral stenosis

(41) Aortic insufficiency

(42) Mitral insufficiency

(43) Aortic stenosis

(44) Organic lesions of the tricuspid valve

(45) Functional classification (NYHA):

1 = Grade I; 2 = Grade II; 3 = Grade III; 4 = Grade IV.

(46 to 47) Source of information _____

Address _____ Telephone No. _____

Comments _____

..... has
rheumatic heart disease and requires
monthly injections of Benzathin
penicillin (ultracillin),

OR

Antibiotic cover is required under
the following circumstances:

TO PREVENT BACTERIAL ENDOCARDITIS

1. Dental procedures other than simple filling;

Amoxycillin 3 gm single oral dose
one hour before dental work.
(1.5 gm for children below 10)

For patients allergic to penicillin
Erythromycin 2 gm is given instead
(1 gm for children below 10 yrs)
2. TONSILLITIS (Oral penicillin for
10 days)

NAME

SCHOOL

ADDRESS

NEAREST HEALTH CENTRE

Amoxycillin 1 gm + Gentamycin 80 mg
 $\frac{1}{2}$ hour before procedure.

Report unexplained fever to the
Health Centre (Clinic)

RHEUMATIC HEART DISEASEDOCTOR'S NOTES

PLEASE SHOW THIS CARD TO THE NURSE,
DOCTOR OR DENTIST EACH TIME YOU
VISIT THE CLINIC OR HOSPITAL

IDENTITY CARD

1. Dental procedures other than simple filling;

5. MINOR SURGICAL PROCEDURES

e.g. Instrumentations of G.U.T.
or rectum.

2. TONSILLITIS (Oral penicillin for
10 days)

NAME

SCHOOL

3. NEAREST HEALTH CENTRE

WARNING : ADRENALIN AND A STERILE SYRINGE AND NEEDLE MUST ALWAYS BE READY WHEN GIVING PENICILLIN INJECTIONS

MONTH	DATE	NURSE'S SIG.	NEXT VISIT	MONTH	DATE	NURSE'S SIG.	NEXT VISIT	MONTH	DATE	NURSE'S SIG.	NEXT VISIT
1			1.					1.			
2			2.					2.			
3			3.					3.			
4			4.					4.			
5			5.					5.			
6			6.					6.			
7			7.					7.			
8			8.					8.			
9			9.					9.			
10			10.					10.			
11			11.					11.			
12			12.					12.			

Side 2

RF/RHD PROPHYLAXIS CARDS (SAMPLES)

(i) Jamaica

MEDICAL EXAMINATIONS				RHEUMATIC FEVER PREVENTION RECORD												Side 1								
DATE	DOCTOR'S SIGNATURE	NEXT APPOINTMENT	NAME																					
			RF. Reg. No.													DOCKET No.								
			ADDRESS																					
			SCHOOL													GRADE								
			PARENT/GUARDIAN																					
			PLACE OF INJECTION																					
			PLACE OF MEDICAL FOLLOW-UP																					
The Rheumatic Fever RHD Control Programme is a Joint Project of the: Ministry of Health  Child Health Dept., University Hospital of the W.I.  The Heart Foundation of Jamaica, Tel. 92-64378.																								
																Your injection is due every four weeks -								
BENZATHINE PENICILLIN												INJECTION RECORD												Side 2
Year 19	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.												
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n.b. Folds at dotted line to be kept in a special plastic envelope.

***WHF/WHO/UNESCO Joint project on RF/RHD prevention
and health promotion in schoolchildren***

Progress Report Form

Reporting period

Country

Programme area

General population

Child population (5-15 years)

National programme manager

Programme centre

Report submitted

Annex IV

WHO Criteria

JONES CRITERIA (REVISED) FOR GUIDANCE IN THE DIAGNOSIS OF RHEUMATIC FEVER¹

Introduction

The Jones Criteria for guidance in the diagnosis of acute rheumatic fever were initially proposed by Jones in 1944, subsequently modified in 1955, and revised in 1965² by a committee of the American Heart Association to emphasize the importance of establishing evidence of antecedent group A streptococcal infection. The criteria were established to minimize the overdiagnosis of rheumatic fever and were developed because there is still no single laboratory test, sign, or symptom pathognomonic of acute rheumatic fever, although several combinations of them are diagnostic. The most common diagnostic problems occur in patients who present with acute polyarthritis. The Jones criteria, designed to establish the diagnosis during the acute stage of rheumatic fever, are not constructed to measure rheumatic activity, to establish the diagnosis of inactive or chronic rheumatic heart disease, or to predict the course or severity of the disease.

The division of clinical and laboratory criteria into major and minor categories is based upon the diagnostic importance of a particular finding. The presence of TWO MAJOR CRITERIA, OR OF ONE MAJOR AND TWO MINOR CRITERIA, indicates a high probability of the presence of acute rheumatic fever, if supported by evidence of a preceding Group A streptococcal infection. Absence of the latter always makes the diagnosis doubtful, except in the specific situations described in the section on "Supporting Evidence of Streptococcal Infection" [page S4].

¹ Reproduced with permission. © Circulation, American Heart Association.

² The 1965 *ad hoc* committee to revise the Jones Criteria (modified) of the Council on Rheumatic Fever and Congenital Heart Disease of the American Heart Association comprised the following people: G. Stollerstein (Chairman), M. Markowitz, A. Taranta, I. W. Wannamaker and R. Whittemore. The present version was prepared in 1982 by the Committee on Rheumatic Fever and Bacterial Endocarditis: S. T. Shulman (Chairman), E. J. Kaplan, A. L. Bisno, H. D. Millard, D. P. Amren, H. Houser, W. E. Sanders Jr., D. T. Durack and C. Wainwakumorn.

Major Manifestations	Minor Manifestations
Carditis	Clinical
Polyarthritis	Previous rheumatic fever or rheumatic heart disease
Chorea	Arthralgia
Erythema Marginatum	Fever
Subcutaneous Nodules	Laboratory
	Acute phase reactants, Erythrocyte sedimentation rate, C-reactive protein, leukocytosis
	Prolonged P-R interval
	Supporting Evidence of Streptococcal Infection
	Increased Titre of Anti-Streptococcal Antibodies ASO (anti-streptolysin O), others
	Positive Throat Culture for Group A Streptococcus
	Recent Scarlet Fever

³ The presence of two major criteria, or of one major and two minor criteria, indicates a high probability of acute rheumatic fever, if supported by evidence of preceding Group A streptococcal infection.

The Jones Criteria are not to substitute for clinical judgement but are designed to guide physicians in the diagnosis of acute rheumatic fever. Physicians should follow questionable cases carefully and restrict diagnosis to illnesses which meet acceptable criteria, thus minimizing patient and parental anxiety, problems with insurability, and unnecessary exposure to the prolonged antibiotic prophylaxis indicated for rheumatic individuals.

Overdiagnosis of Rheumatic Fever

Overdiagnosis has assumed even greater importance in recent years in developed countries with the decline in incidence and severity of rheumatic fever and rheumatic heart disease. Following well-documented Group A streptococcal infections, vague signs, symptoms and findings including extremity discomfort, borderline temperature elevations, increased intensity of functional murmurs, anxiety-related tachycardia, elevated sedimentation rate, and prolonged P-R interval on electrocardiogram may be present in the absence of major criteria. Follow-up of such patients has not revealed the delayed appearance of rheumatic heart disease.

Therefore, the diagnosis of acute rheumatic fever should be made only when major clinical manifestation(s) are present. A common error is the premature administration of salicylates or corticosteroids before the signs and symptoms of rheumatic fever become unmistakable. An ill-defined syndrome, only possibly rheumatic fever, often results. This leaves in doubt the subsequent management of the patient, particularly the necessity for long-term antibiotic prophylaxis to prevent streptococcal pharyngitis and recurrent rheumatic fever. Clearly, one should not suppress the signs and symptoms of acute rheumatic fever until they are distinctly expressed so that the diagnosis can be firmly established. There is no evidence that withholding anti-inflammatory therapy has an adverse effect upon the long-term prognosis of the patient.

Echocardiography has proved to be a valuable tool in differentiating individuals with bicuspid aortic valves or the mitral valve prolapse syndrome from those patients with rheumatic heart disease.

Carditis
Rheumatic carditis is virtually always associated with a significant murmur (see "Murmurs Indicating Carditis" [p. 57]). Consequently, the other manifestations of carditis listed below, when not associated with a significant murmur, should be labelled rheumatic carditis with great caution. Infectious myocarditis (usually viral) may be particularly confusing in this regard.

Murmurs

1. In a patient without previous history of rheumatic fever or rheumatic heart disease, a significant apical systolic murmur (mitral regurgitation), apical mid-diastolic (Carey-Coombs) murmur or basal diastolic murmur (aortic insufficiency).
2. In a patient with previous rheumatic fever or rheumatic heart disease, a definite change in the character of any pre-existing murmur or the appearance of a new significant murmur.

Cardomegaly

- Unequivocal cardiac enlargement in a patient without a history of previous rheumatic fever, or an obvious increase in cardiac size in a patient with a past history of rheumatic heart disease.

Percarditis

- Manifested by a friction rub, pericardial effusion, or definitely electrocardiographic or echocardiographic evidence.

Congestive Heart Failure

- In a child or young adult in the absence of other discernible causes.

Polyarthritis

- Polyarthritis, the most frequent major manifestation, is almost always migratory, unless the clinical expression is abortive b

Premature administration of anti-inflammatory agents. Polyarthritis is manifested by swelling, heat, redness and tenderness, or by pain and limitation of motion, of two or more joints. The joints most frequently involved are the larger joints, particularly knees, ankles, elbows, and wrists. Arthralgia alone, without other evidence of joint involvement, may occur in rheumatic fever, but cannot be considered a major manifestation.

Chorea

Purposeless, involuntary, rapid movements often associated with muscle weakness and/or behavioral abnormalities are characteristic of chorea. These movements must be differentiated from tics, athetosis, and hyperkinesis. Other neurologic entities, including Huntington's chorea, systemic lupus erythematosus, Wilson's disease and drug reactions should be excluded. Because chorea is frequently a delayed manifestation of rheumatic fever, other rheumatic manifestations may or may not be present.

Minor Manifestations

Clinical

These non-specific clinical features occur frequently in rheumatic fever. Because they also often occur in numerous other diseases, their diagnostic value is limited. The usefulness of these manifestations is in supporting the diagnosis of rheumatic fever when only a single major manifestation is present.

History of previous rheumatic fever or evidence of pre-existing rheumatic heart disease increases the index of suspicion in evaluating any rheumatic complaint. The history must be well documented, or the evidence of pre-existing rheumatic heart disease be definite.

Arthralgia constitutes pain in one or more joints (not in the muscles and other periarticular tissues) without objective evidence of inflammation, tenderness, or limitation of motion. The presence of arthralgia should not be used for diagnosis when polyarthritis is a major manifestation.

Fever, which is usually at least 39°C (102.2°F), is generally present early in the course of untreated rheumatic fever.

Erythema Marginatum

This distinctive evanescent, pink rash is a rare manifestation of rheumatic fever. The erythematous areas often have pale centers and round or serpiginous margins. They vary greatly in size and occur mainly on the trunk and proximal extremities, never on the face. The erythema is transient, migratory and may be induced by the application of heat. It is non-pruritic, non-indurated, and blanches on pressure.

Subcutaneous Nodules

These firm, painless nodules are present over the extensor surfaces of certain joints, particularly elbows, knees and wrists, in the occipital region, or over the spinous processes of the thoracic and lumbar vertebrae. The skin overlying them moves freely and is not inflamed. Nodules are rare but are most often associated with the presence of carditis.

Laboratory

Acute phase reactants offer objective but non-specific confirmation of the presence of an inflammatory process. The erythrocyte sedimentation rate (ESR), C-reactive protein (CRP), and leukocyte count are most commonly employed. Unless the patient has received corticosteroids or salicylates, these tests are almost always abnormal in patients who present with polyarthritis or acute carditis, whereas they are often normal in patients presenting with chorea alone. The ESR is elevated in acute rheumatic fever, but may be elevated by anemia and decreased in congestive heart failure. The CRP, another sensitive indicator of inflammation, is unaffected by anemia. Leukocytosis is generally present in acute rheumatic fever.

Electrocardiographic changes, mainly P-R interval prolongation, are frequent, but may occur in other inflammatory processes. Their presence therefore does not constitute adequate criteria for carditis. Furthermore, P-R prolongation per se does not correlate with the ultimate development of chronic rheumatic heart disease.

The diagnosis of acute rheumatic fever should never be made solely on the basis of laboratory findings plus minor clinical manifestations. On the other hand, since laboratory indications of recent streptococcal infection and inflammation occur so regularly in this disease, their unexplained absence should make the physician very seriously question the diagnosis of rheumatic fever.

Supporting Evidence of Streptococcal Infection

Acute rheumatic fever is a consequence of group A streptococcal infection of the upper respiratory tract. A number of other disease processes unrelated to antecedent streptococcal infection may present clinical features which closely mimic rheumatic fever. For this reason, laboratory evidence of preceding streptococcal infection, by specific antibody tests or by identification of the offending organism, greatly strengthens the possibility of acute rheumatic fever and should be sought diligently in all suspected cases. Evidence of antecedent streptococcal infection by a history of recent attack of scarlet fever is the best *clinical* indication of recent streptococcal infection. In contrast, history of sore throat is useful but is *not* adequate evidence of recent streptococcal infection, because only a minority of cases of pharyngitis are caused by group A streptococci.

Streptococcal Antibody Tests

The most reliable evidence of group A streptococcal infection capable of producing acute rheumatic fever is an elevated or, preferably, a rising streptococcal antibody titer. These titers differentiate antecedent streptococcal from other acute respiratory infections and are increased following asymptomatic as well as symptomatic streptococcal infections. It should be recognized that non-group A streptococcal infections may at times lead to elevations of certain of these antibodies, particularly the anti-streptolysin O. Streptococcal antibody levels are generally increased in the early stages of acute rheumatic fever but may be declining, or low, if several months have elapsed between acute streptococcal infection and the detection of acute rheumatic fever. This occurs most often in patients whose sole presenting rheumatic manifestation is chorea.

cardiologists may have been initiated several months before recognition. With these exceptions, one should be very reluctant to make the diagnosis of acute rheumatic fever if adequate tests fail to produce *serologic evidence of recent streptococcal infection*.

The anti-streptolysin O (ASO) assay is the most widely used streptococcal antibody test. The range of normal values for this test, as for all tests of serum antibodies to streptococcal extracellular products, is variable and depends upon the age of the patient, geographic locale, epidemiologic setting and the season of the year.

In the absence of specific information regarding the appropriate range of normal values in a given geographic area, single ASO titers are generally considered to be increased if they are *at least* 250 Todd units in adults and *at least* 333 units in children over 5 years of age. Depending on the prevalence of streptococcal infections, a varying proportion of the normal population will show titers of this magnitude. About 20% of patients studied within the first two months of an attack of rheumatic fever, and most patients who present with chorea alone, have a low or borderline ASO titer. In these instances, it is advisable to measure antibodies to other streptococcal antigens. When two or more different streptococcal antibody tests are performed, an increased titer will be found in almost all cases of acute rheumatic fever (except for cases of isolated chorea) within the first few months of onset.

Two other standardized commercially available tests are the anti-deoxyribonuclease B (anti-DNAase B) and anti-hyaluronidase determinations. The normal range for these tests also depends upon variables such as methodology and local prevalence of streptococcal infections and may be different from ASO values. Slide agglutination tests for the detection of streptococcal antibodies are rapid, simple to perform, and widely available. However, these reagents are less well standardized than those of the other tests mentioned above. To document recent streptococcal infection by *rising* titers, serum samples should be obtained at two to four week intervals and all tested simultaneously. A rise in titer of two or more dilution increments is diagnostic of recent streptococcal infection. It should be remembered that serum titers of streptococcal antibodies other than ASO may rise following streptococcal skin infections; such infections do not give rise to acute rheumatic fever.

Isolation of Group A Streptococci

A minority of patients with acute rheumatic fever will have positive throat cultures for group A streptococci at the time of diagnosis of acute rheumatic fever. This relatively low isolation rate is due to a number of factors, including a) the rather long latent period between the antecedent streptococcal infection and the development of symptoms of rheumatic fever, b) delay in consideration of the diagnosis of rheumatic fever and thus in obtaining throat cultures, and c) administration of antibiotics prior to throat culture. In addition, a significant number of *normal* individuals, particularly children, may harbor group A streptococci in their upper respiratory tracts. For these reasons, throat cultures are less satisfactory than antibody tests as supporting evidence of recent group A streptococcal infection.

Other Clinical Features

These may include abdominal pain, rapid sleeping pulse rate, tachycardia out of proportion to fever, malaise, anemia, epistaxis, and precordial pain. Because these signs and symptoms are very frequent in other diseases, their usefulness is less than that of the Minor Criteria. Although they are not to be considered diagnostic, they may provide additional evidence of the presence of rheumatic fever. A family history of rheumatic fever may also heighten the suspicion of rheumatic fever.

Combinations of major and minor manifestations and other clinical features may occur in other diseases which may need to be ruled out before a definitive diagnosis of rheumatic fever is made. One particular combination of findings - polyarthritis, fever and elevated sedimentation rate - is common in a variety of other disorders. Diseases to be ruled out include rheumatoid arthritis, systemic lupus erythematosus, infective endocarditis, serum sickness, drug reactions, gonococcal arthritis, sickle cell disease, viral myopericarditis, leukemia, tuberculosis, and septicemia. The clinician must also be aware that mitral insufficiency due to the mitral valve prolapse syndrome and aortic stenosis and/or insufficiency due to congenital bicuspid aortic valve may be confused with rheumatic carditis and rheumatic valvular heart disease. Most of these diseases can be diagnosed with assurance by appropriate tests. Streptococcal antibody determinations are often useful in these

differential diagnoses, especially in stimulating the search for other causes when they are not elevated.

Murmurs Indicating Carditis

Significant Apical Systolic Murmur

This is a long murmur of blowing quality and high pitch filling most of systole, which is indicative of mitral regurgitation. It is heard best in the apical region and is usually transmitted towards the axilla. The intensity of the murmur is variable, particularly in the early stages of illness, but is at least of grade two on a scale of six. It does not change substantially with position or respiration. The murmur of rheumatic mitral insufficiency must be distinguished from the click-murmur syndrome associated with mitral valve prolapse, which is most often characterized by a mid-systolic click and a late-systolic murmur.

The murmur of mitral regurgitation must be differentiated from functional (innocent) murmurs which frequently occur in normal individuals, especially children. Functional murmurs usually occupy only a portion of systole. They may be quite loud, particularly in anxious or febrile patients, and are rather widely transmitted in thin-chested individuals. These murmurs may be heard only intermittently and tend to vary with position and respiration. They are usually of two types: an ejection-type murmur heard best over the pulmonary area, and a low-pitched, vibratory, or musical murmur heard best along the lower left sternal border. The former is frequently transmitted to the neck and may be mistaken for aortic stenosis. The latter is frequently transmitted to the apex and is most likely to be confused with mitral regurgitation by those unfamiliar with its characteristic quality.

Apical Mid-diastolic Murmur

Mitral regurgitation and cardiac dilatation accentuate the third heart sound as a result of rapid flow of blood from atrium to ventricle in diastole. During tachycardia, this may produce a proto-diastolic gallop rhythm. Frequently, however, in acute rheumatic carditis with mitral regurgitation, the third heart sound is followed, or obscured, by a low-pitched mid-diastolic (Carey Coombs)

murmur. This can be heard best with the patient in the left lateral recumbent position with the breath held in expiration. The same murmur may occur in other forms of acute carditis or in conditions causing rapid blood flow into the left ventricle, such as chronic, severe mitral regurgitation, left to right shunts, hyperthyroidism, sickle cell and other severe anemias. It must be differentiated from the low-pitched, crescendo apical presystolic rumble followed by an accentuated mitral first heart sound, which is indicative of established mitral stenosis rather than of acute carditis.

Basal Diastolic Murmur

Thus murmur of aortic regurgitation begins early in diastole. It is high-pitched, blowing, decrescendo, and is heard best along the left sternal border after deep expiration with the patient leaning forward. It is of great diagnostic importance, but may be difficult to hear and may be present only intermittently. In an individual suspected of having aortic regurgitation due to rheumatic fever, care must be taken to exclude a congenital bicuspid aortic valve as the source of the murmur.

8. CLINICAL ASPECTS

8.1 Diagnostic role of noninvasive techniques

8.1.1 Phonocardiography

The use of phonocardiography as a mass screening method has been considered by a WHO Expert Committee (3). However, careful training of paramedical staff in auscultation is a more effective and efficient method as long as positive findings are reviewed by a physician.

8.1.2 Echocardiography

The combined use of echocardiography and Doppler ultrasonography has high sensitivity and specificity in the assessment of rheumatic heart disease, providing an image of valve abnormalities (usually making it possible to exclude other types of lesion) and an assessment of functional abnormalities. This diagnostic method may also permit more sensitive diagnosis of rheumatic carditis. Trained technicians and reliable equipment are needed to ensure a correct diagnosis. This noninvasive technique represents a significant advance in the diagnosis and management of patients with rheumatic heart disease, and should be made as widely available as possible.

Mitral stenosis produces typical patterns in the M-mode echocardiogram, which can provide semiquantitative evidence of severity. Two-dimensional echocardiography allows a relatively accurate assessment of valve area which can be confirmed by Doppler assessment. Doppler assessment also allows reliable grading of mitral regurgitation as mild, moderate, or severe. Similar considerations apply to assessment of tricuspid valve lesions. Aortic valve area can be assessed using two-dimensional echocardiography, and Doppler ultrasonography allows accurate assessment of the aortic valve gradient. Assessment of aortic regurgitation is usually acceptable for clinical purposes. Left ventricular function can be assessed with both two-dimensional and M-mode techniques.

With good echocardiography and Doppler ultrasonography facilities, cardiac catheterization is required less frequently for assessment of rheumatic valve lesions.

REFERENCES

1. JONES, T.D. Diagnosis of rheumatic fever. *Journal of the American Medical Association*, 126: 481-484 (1944).
2. MARKOWITZ, M. & GORIUS, L. *Rheumatic fever*. Philadelphia, W.B. Saunders, 1972.
3. STOLLEMAN, G. H. *Rheumatic fever and streptococcal infections*. New York, Grune and Stratton, 1975.

8.4 Infective endocarditis

Infective endocarditis remains a major threat to any patient with rheumatic valvular heart disease. Despite the recent therapeutic advances, there is no convincing evidence that the incidence of infective endocarditis has fallen in patients with rheumatic heart disease. Furthermore, mortality rates remain significant, and prevention of infective endocarditis is therefore extremely important.

There has never been a controlled study to demonstrate the effectiveness of antibiotics in preventing infective endocarditis, but numerous studies have documented the ability of antibiotics to prevent bacteraemia following dental and several surgical procedures. Since bacteraemia must precede the establishment of infective endocarditis, the rationale for antibiotic prophylaxis for prevention of endocarditis has been established.

Prevention of infective endocarditis is limited by the fact that a predisposing event or portal of entry for the bacteria cannot always be identified. Nevertheless, every effort should be made to educate patients about the importance of meticulous dental hygiene, the need for antibiotic prophylaxis with all surgical and dental interventions, the importance of medical supervision of any concurrent bacterial infection, and the importance of recognizing early symptoms of possible endocarditis.

Advice about prophylaxis is likely to be forgotten over the years, even by well educated patients. Therefore, a card or other handout outlining the principles of prophylaxis, is useful for each patient. Several national scientific advisory groups have made proposals for prophylaxis. Although differing somewhat in the recommendations for doses of antibiotics, all of these regimens agree that:

- (a) should be based on available bacteriological, clinical and, to some extent, experimental evidence;
- (b) should offer the maximum opportunity for patient compliance; and
- (c) should be simple and easily remembered by both practitioners and patients.

For effective protection against endocarditis, adequate blood levels of antibiotics are required not only during the period of bacteraemia but also for several hours afterwards, in order to eradicate organisms that may have lodged on the cardiac lesion.

Individual proposals vary slightly in terms of the recommended drugs, doses and duration of treatment, but not in indications for prophylaxis. Recommendations have been revised whenever new data have become available, and are likely to change in the coming years. It is thus beyond the scope of this report to review and compare the various proposals. The recommendations made by the Study Group are not identical to any of the previously published recommendations for prevention of bacterial endocarditis, but are compatible with those recommendations for most situations. Special provision is made for interventions likely to cause bacteraemia with bowel organisms, and for patients who are on long-term penicillin, are allergic to penicillin, or have a particularly high risk of endocarditis.

Infective endocarditis is a particularly serious problem in patients with prosthetic valves, which are especially susceptible as sites of infection. Special measures are also indicated for patients with severe lesions of their native valves (especially the aortic valve) and for patients with a history of prior infective endocarditis.

Recommendations for standard prophylaxis for dental procedures range from a single dose of 3 g of amoxycillin before the procedure, to two doses of 2 g of penicillin. There is no significant difference in the number of cases of detectable bacteraemia in patients given 2 g of phenoxymethylpenicillin and 2 g of amoxycillin. Furthermore, on the basis of *in vitro* antibiotic sensitivity tests, there appears to be no significant difference between amoxycillin and phenoxymethylpenicillin in their prophylactic effects. Although some manufacturers of antibiotics have been recommended by some

committees, the Study Group favoured the administration of two doses at a six-hour interval. Alternative regimens have been specified for patients with special requirements.

8.4.1 Indications for prophylaxis

Prophylaxis is required for all patients with valve lesions, whether of rheumatic origin or not, but is not required for patients with a normal heart despite previous rheumatic fever. All dental procedures that cause bleeding, including professional cleaning, require prophylaxis, particularly in the presence of gingival disease. With the treatment schedule recommended (Section 8.4.2), repeat dental procedures in which the same antibiotic is used for prophylaxis should be carried out at least two weeks apart. This will keep to a minimum the number of resistant bacteria in the oral cavity.

Prophylaxis is required for respiratory tract procedures including tonsillectomy, adenoidectomy, rigid bronchoscopy, or biopsies involving respiratory mucosa.

Prophylaxis is also required for surgery or instrumentation of the genitourinary or gastrointestinal tracts. The risk of endocarditis appears to be low with sigmoidoscopy, uncomplicated childbirth, caesarean section, sterilization, and insertion or removal of an intrauterine device (unless infected). Nevertheless, it would be prudent to give prophylaxis in high-risk patients, or where aseptic precautions are less than ideal.

8.4.2 Recommended prophylaxis schedule: dental or respiratory procedures

(i) Procedures under local anaesthetic

(a) Standard-risk patients: amoxycillin 2 g or phenoxymethylpenicillin 2 g, orally, 1 hour before the procedure and 1 g, orally, 6 hours later.

(b) High-risk patients (patients with prosthetic valves, severe lesion of native valves, or history of previous endocarditis): amoxycillin, 1 g, intravenously, plus gentamicin, 80–100 mg, intravenously, immediately before the procedure, and amoxyceillin, 1 g, intravenously or orally, 6 hours later. For minor procedures

where the risk of bacteraemia is judged to be low, the use of oral amoxycillin, as for standard-risk patients, may be acceptable.

(c) For patients allergic to penicillin, or those who have recently (within 2 weeks) received penicillin, or who are on long-term penicillin prophylaxis: erythromycin, 1.5 g, orally, 1 hour before the procedure and 0.5 g, orally, 6 hours later.

(ii) *Procedures under general anaesthetic*

- (a) Standard-risk patients: ampicillin, 1 g, intravenously, on induction of anaesthesia and 1 g, intravenously or orally, 6 hours later.
- (b) High-risk patients: ampicillin, 1 g, intravenously, plus gentamicin, 80–100 mg, intravenously, over 3 minutes, both drugs given on induction, followed by ampicillin, 1 g, intravenously or orally, 6 hours later. This regimen is also suitable for those who have received recent penicillin treatment or who are on long-term penicillin prophylaxis.

(c) For patients allergic to penicillin: vancomycin, 1 g, intravenously, infused slowly over 1 hour.

Note: Parenteral benzylpenicillin, 2 000 000 units, is considered equivalent to 2 g of phenoxymethypenicillin or amoxycillin. A lower gentamicin dose is appropriate in the presence of renal impairment.

8.4.3 *Recommended prophylaxis schedule: gastrointestinal and genitourinary tract procedures*

- (a) Standard regimen: ampicillin, 1 g, intravenously, plus gentamicin, 80–100 mg, intravenously, at induction, and ampicillin, 1 g, intravenously or orally plus gentamicin, 80–100 mg, intravenously 6 hours later.
- (b) For patients allergic to penicillin: vancomycin, 1 g, infused over 1 hour before the procedure plus gentamicin, 80 mg, intravenously at induction.
- (c) Oral regimen for minor or repeated procedures in low-risk patients: amoxycillin 3 g, orally, 1 hour before the procedure and amoxycillin, 1.5 g, orally, 6 hours later.
- Note:** The additional dosage of gentamicin in (a) and (b), and the higher dose of amoxycillin in low-risk patients, are recommended because the likely infective organisms are enterococci. A lower dose of gentamicin is appropriate in patients with renal impairment.

Complete recommendations for endocarditis prophylaxis are available elsewhere (58–60). In the present proposals, deviations from other published recommendations are minimal and are included only as a slight simplification. For example, cephalosporins would provide adequate protection in most cases but they are not included here because, in general, they have no apparent important advantage.

8.4.4 *Drug dosages for children*

Drug dosages must be adjusted appropriately for children. Appropriate doses should be determined according to the weight of the child. Details are readily available in current textbooks and doses should be carefully calculated. The children's dose must not exceed the adult dose.

8.4.5 *Other considerations*

Prophylaxis of infective endocarditis should not be confused with rheumatic fever prophylaxis. The indications are different, the drugs are different, and the timing and dosages are different.

Appendix II

Recommendations for progress report and evaluation form

WHO Global Rheumatic Fever/Rheumatic Heart Disease Prevention

Progress Report and Evaluation Form

Reporting period

Country

Programme area

General population

Child population (5-15 years)

National programme manager

Programme centre

Report submitted

PART A REVIEW

1. Progress Review¹ (.....)

2. Plan of action²

¹ Please report only on aspects of the programme not reflected in the structured report forms. (a) Relate achievements and shortcomings to the activities and targets scheduled for the period, and indicate remedies for the shortcomings. (b) Review expenditure in relation to the budget allocated for the period. (c) State if the National Advisory Committee met during the period, and indicate any important steps or policy decisions likely to affect the future extension and devolution of the national programme.

² Indicate ongoing and new activities with targets to justify the budget requested for the period.

PART B PROGRAMME ACTIVITIES

SECTION 1: CASE FINDING AND REGISTRATION

1 Case finding

1.1 Screening in schools:

Started

Completed

Results

Schools screened	Total target pop.	Actual number screened	Cases suspected		Cases confirmed*		RF/RHD prev. per 1000 ³		New cases registered ⁴	
			RF	RHD	RF	RHD	RF	RHD	RF	RHD
1.										
2.										
3.										
TOTAL										

Comments: (Please include: type of screening survey team - school health service or ad hoc team; RF/RHD screening only or multi-purpose survey; problems that are likely to affect reliability of the results.)

1.2 Hospital retrospective survey:

Hospital	Cases suspected		Cases confirmed*		New cases registered ⁴	
	RF	RHD	RF	RHD	RF	RHD
1.						
2.						
3.						
TOTAL						

* according to standard criteria of confirmation

³ Cases confirmed/schoolchildren screened

⁴ record here only new additions to the register. Rediscovered cases already registered should be included under "Cases confirmed", but **not** under "New cases registered".

1.3 RF/RHD cases identified from other sources

	Cases suspected		Cases confirmed		Newly registered	
	RF	RHD	RF	RHD	RF	RHD
1. School health service (excluding cases recorded under 1.1)						
2. Hospitals and clinics (excluding cases recorded under 1.2)						
3. Others (please specify) Policlinic Health Centre Family doctor Private physician						
TOTAL						

2. Registration (Summary)

2.1 Registered cases

	Number	
	RF	RHD
Total number registered in the whole programme area at the beginning of period		
New registrations from: School screening (1.1)		
Retrospective survey (1.2)		
Other sources (1.3)		
Total number registered at end of period		

2.2 Characteristic of register centre(s)

Number of local/regional registers?

How often is a report submitted?

SECTION II: FOLLOW-UP AND SECONDARY PROPHYLAXIS – COVERAGE

Prophylaxis	Month												Total
	1	2	3	4	5	6	7	8	9	10	11	12	
Benzathine penicillin	No. of patients registered												
	No. of patients compliance												
Oral penicillin	No. of patients registered												
	No. of patients compliance												
Erythromycin	No. of patients registered												
	No. of patients compliance												
Sulphonamide	No. of patients registered												
	No. of patients compliance												
Total	No. of patients registered												
	No. of patients compliance												
Rheumatic fever recurrences in registered cases													

Characteristics:

Penicillin adverse reactions: number? Type? Death?

SECTION III: PERSONNEL TRAINING

	Numbers trained	Type of training	Objectives of training	Duration of training	Educational material used
School teachers					
Health auxiliaries					
Nurses					
Doctors					
Others					

Comments: brief statement of purpose and duration of training

Characteristics: Type of training?

Who gave the training course?

Was any information/educational material distributed?

Was any evaluation carried out?

SECTION IV: HEALTH EDUCATION ACTIVITIES

1. Schools

Does health education in schools include improving health and health environment?

Does health education in schools include RF/RHD prevention?

Yes _____ No _____

Does health education in schools include a healthy lifestyle?

Yes _____ No _____

If yes, what method of evaluation is used?

KAP⁵ _____ Other _____ Not evaluated _____

⁵ KAP (Knowledge, Aptitude and Practices) tests on a sample before and sometime after the course.

2. Families and the general public

Has a formal curriculum been prepared?	Yes	No
Number of group health education sessions held		
Number of pamphlets/brochures distributed		
Number of posters displayed and where (schools, health centres/units, public places, etc.)		
Number of slide-tape sessions held		
Number of video presentations given		
Media time (radio and TV) taken up per month (in minutes)		

Comments: Other approaches used, if any: problems encountered; method of evaluation, recommendations for improvement, changes in the school health infrastructure, etc? Relevant achievements in health education and health promotion.

PART C BUDGET UTILIZATION AND REQUIREMENTS

1. Current status

	Allocated US\$	Used US\$	Obligated ⁶
Equipment and supplies			
Personnel training			
Transport and related costs			
Consultants			
Contingencies			
Total US\$			

2. Requirements for the next six months: (.....)

	US\$
Equipment and supplies (total)	
Drugs & syringes	
Special items:	
Laboratory	
ECG	
Stationery (record forms)	
Health education materials	
Personnel training	
Transport and related costs	
Consultants (specify) ⁷	
TOTAL	

3. Technical and financial support characteristics:

Institution(s) which provide technical support

Institution(s) which provide financial support

Institution(s) which visit the area

⁶ It is advisable to allow at least eight weeks for processing the release of the next instalment of funds. Requirements during this period must be anticipated and obligated from the funds in hand so that there is no break in project activities due to delays in processing the request for the next instalment.

⁷ Please keep "Consultants" and "Contingencies" to minimal levels; if necessary, reallocate funds under these headings to other components.

PART D EVALUATION OF EFFECTIVENESS

1. Evaluation of registered cases:

1.1 Distribution by number of attacks:

Only one _____ Two or three _____ Four or + _____

1.2 Distribution by severity:

RF without valve damage No. _____ % _____

RHD - mitral regurgitation (Grade I-II) No. _____ % _____

RHD - mitral regurgitation (Grade III-VI) No. _____ % _____

RHD - mitral stenosis or double lesion No. _____ % _____

Aortic regurgitation No. _____ % _____

1.3 Heart failure No. _____ % _____

1.4 RF/RHD death:

From the programme area _____

Outside the programme area _____

1.5 Number of recurrence attacks:

From the programme area _____ % _____

Outside the programme _____ % _____

2. RHD requiring heart valve surgical care:

2.1 Number of cases operated:

From the programme area _____

Outside the programme area _____

2.2 Number of cases on waiting list:

From the programme area _____

Outside the programme area _____

3. Numbers and relative frequency of acute rheumatic fever

Year Hospital or Community N1	First attacks		Recurrence attacks		Deaths	
	N2	%	N2	%	N2	%
Without heart involvement						
With valvulitis						
With other heart involvement						
TOTAL						

N1 No. of patients admitted during the year or no. of persons in the community

N2 No. of attacks

% In comparison with N1

If possible please indicate:

- Family, school, soldier or other clustered cases groups
- Socio-economic level (OPTIONAL)
- Rural/urban.
- Previous comparative study
- By area (at least Programme area, other area)

4. RF/RHD prevalence

	RF		RHD		RHD with HF		TOTAL		DEATH	
	N2	Per 1,000	N2	Per 1,000	N2	Per 1,000	N2	Per 1,000	N2	Per 1,000
School or community										
Survey or screening: N1										

N1 No. of schoolchildren or persons in the community.

N2 No. of cases

% In comparison with N2.

HF Heart failure.

Please indicate the characteristics of the school or the community population:

- What sorts of persons
- Socio-economic levels

- Rural/urban
 - Previous comparative study
 - By area (at least Programme area, other area)

Data to be collected for prevalence

- | | | |
|----|--|---|
| 1. | Population | Socio-economic
Availability of medical care
Educational status |
| 2. | Baseline epidemiology of Rheumatic Fever in the population | Characteristics of first attacks
No. of ARF cases in a target hospital |
| 3. | Compliance and coverage | |
| 4. | No. of cases | Prevalence
RF/RHD |
| 5. | Incidence of RF | 1 st attack |
| 6. | Severity of RHD cases (clinical spectrum of RHD cases) | No. RHD
Mild RHD
RHD with HF |
| 7. | No. of recurrent attacks | |
| 8. | No. of surgical candidates | |

