

Disease Management Reporter in Japan

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In Japan, there are two aspects to employer health management in the workplace: managing employee safety and preventive health under the Industrial Safety and Health Law; and providing healthcare services to employees and dependents through the company's health insurance society (i.e. the self-insuring healthcare financing vehicle) under the Health Insurance Law. Recently, increasing attention is being given to the prevention and management of lifestyle-related chronic diseases in both areas.

In this issue, we present two case studies of prevention and management of lifestyle-related diseases in the workplace. The program in the first case has the goal of reducing employee risk for developing coronary heart disease from the standpoint of the employer's responsibility under the Industrial Health and Safety Law. The second case describes disease prevention and management services under development by health insurance societies targeting diabetes, hyperlipidemia, and other chronic conditions.

Case Study from the Takatsuki Health Service Center, Matsushita Electric Industrial Co., Ltd.

- CPAP (Coronary Heart Disease Preventive Assist Program) -

At the Takatsuki Health Service Center (headed by Dr. Masahito Ito) of the Matsushita Electric Industrial Co., Ltd., health management guidance has been formulated for those employees at high risk of developing coronary heart disease (Coronary Heart Disease Preventive Assist Program: hereinafter called "CPAP") as a part of the follow-up measures for annual employer medical checkups. In Japan, employers are obligated to offer such annual health exams to all employees by law. First, a Framingham Study-based coronary heart disease prediction model is used to calculate the risk of developing coronary heart disease (cumulative incidence rate of myocardial infarction and cardiac angina within 10 years, hereinafter called "CHD risk"). The program targets employees who have high-risk of, but have not yet developed, cardiovascular disease. While there are no unilateral limitations of employee workload, the employees are provided health counseling and encouraged to correct and improve their lifestyle on a voluntary basis. The goal is to both reduce their risk of developing disease, and restore their health back to the level that allows for a heavier workload including, for example, night shift work for factory workers. By implementing this program, it is anticipated that the employer can more consistently fulfill its obligation of promoting health and safety while employees learn to prevent their own health problems.

Reason for Targeting Coronary Heart Disease

A health management matrix (see Fig. 1) is a conceptual diagram used for determining priorities in health management in the workplace. The vertical axis represents the degree of statutory employer responsibility and the horizontal axis represents risk of death. For example, in the case of employee suicide or death resulting from overwork, there would be a high chance of the employer being questioned for their potential

responsibility.

Article 35 of the Enforcement Ordinance of the Labor Standards Law stipulates rules for "job-related diseases". Including death by overwork, job-related cardiovascular disease falls under category No. 9 "other diseases clearly resulting from occupation". Generally, there are co-morbid conditions including hypertension, hyperlipidemia, and diabetes in such cardiovascular disease. In addition to cases where disease has resulted directly from work-related problems, assignment to a midnight shift, long working hours, and overseas duties are also deemed as specific tasks with heavy workload by the Ministry of Health, Labor and Welfare, even though physically speaking they might not fall under the category of heavy workload. If a worker has a cardiovascular event such as an acute myocardial infarction when the heavy workload was knowingly imposed on top of underlying cardiovascular disease, the cause of such a cardiac event is likely to be attributed to the job. In order to avoid such work-related incidents, it is necessary to reevaluate the labor management policy.

Fig. 1: Health Management Matrix

	Risk of Death (High) ⇒	(Medium)	⇒ (Low)
Individual Responsibility	Self-responsible diseases (severe): cancer, etc.	Self-responsible diseases (moderate)	Self-responsible diseases (minor)
↓	CVD (work related disease) High-risk workers	Mental disorder Lifestyle-related disease	Decreased physical strength Insufficient health education
	Death or suicide resulted from overwork (Fatal incident)	III or distribution 3 3rd management division Poor mental health environment (Incident of absence and sequelae)	III part 1 or distribution 2 2nd management division Unfavorable mental health environment (More than slight incident)
Employer Responsibility			

(Source) Takatsuki HealthService Center, Matsushita Electric Industrial Co., Ltd.

Contents

Case Study from the Takatsuki Health Service Center, Matsushita Electric Industrial Co., Ltd. 1

Activities at Healthcare Committee Co., Ltd. 4

Health Service Center Program

In recent years it has been proposed that not only individual clinical risk factors such as hypertension, smoking, abnormal lipid metabolism, impaired glucose tolerance, and obesity, but also combinations of these risk factors, even if each does not show an abnormal value, can contribute to an increased cardiovascular risk described as “Multiple Risk Factor Syndrome”.

Two strategies were considered. The “High-Risk Management Strategy” targets a small number of subjects with a high-risk of death, whereas the “Population Management Strategy” targets subjects other than those with high-risk. For this latter group, they feel that reduced physical strength due to lack of exercise is a common factor in development of lifestyle-related diseases such as cardiovascular and cerebrovascular diseases. Since the Health Service Center did not have enough manpower to take on both strategies at the same time, the Population Management Strategy was assigned to the Safety and Health Committee and its subordinate organization, the Health Promotion Division, while the Health Service Center focused on the High-Risk Management Strategy, described below.

Flow of CPAP

As shown in Fig. 2, CPAP steps begin from the results of the annual employer medical checkups.

First, among the employees who have undergone a routine medical checkup, CHD risk is calculated for all subjects of age “30”, “35” and “40 or over” who had blood tests. The calculation is performed using software employing a coronary heart disease risk assessment model based on the Framingham Study. The following data are input into the model: gender, age, total cholesterol, HDL-cholesterol, systolic blood pressure, diastolic blood pressure, presence of diabetes (including borderline cases), and current smoking habits.

Those with 14 % and less CHD risk (as defined above) were considered to be “able to work”, those with 15 to 19 % of CHD risk were “able to work with caution” while calling attention to their being in a high-normal risk group, and those with 20 % and more CHD risk were classified as a high-risk group. For the last group, medical history, a physician consultation, detailed job description (type of work, working hours, etc.), and ultrasound of the carotid arteries were conducted. When required, exercise electrocardiography and 24-hour blood pressure measurement

were also performed.

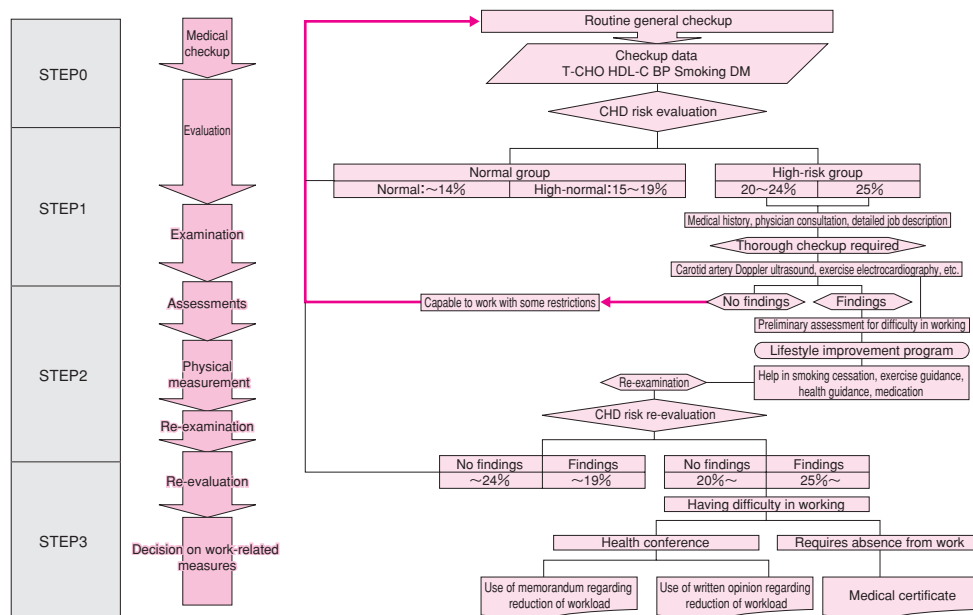
Among the high-risk workers, those found to have medical findings from carotid artery ultrasound, exercise electrocardiogram, or other tests, underwent a preliminary assessment for difficulty in working and were enrolled in a lifestyle improvement program. This program covered diet, weight reduction, and exercise guidance, along with help in smoking cessation for the purpose of positive lifestyle modification. After three months in the program, they underwent re-evaluation. If the re-assessed CHD risk was less than 20 %, they were classified as being “capable to work with some restrictions”. If the worker was still classified as “having difficulty in working” in the re-evaluation, the case would most likely be discussed at a Health Conference. Such meetings consisted of the Health Service Center (company physician), the Human Resources Department, the direct supervisor, and the employee concerned. At this meeting they would discuss the details of the measures to be taken with regard to the worker’s condition and wishes, while giving due consideration to privacy concerns.

For the systematic implementation of the program, a critical path has been developed. It is a checklist to avoid duplicated or overlooked guidance among various parties involved including the company physician, company nurse, healthcare educator and occasionally the personnel administration officer and occupational health supervisor. The critical path is drawn up for each subject and gives all personnel an at-a-glance picture of the next step to take in the procedure. It is also instrumental in information sharing.

CHD risk

According to the center head, Dr. Ito, the number of cases of coronary heart disease expected from the Framingham Study coronary heart disease prediction model was 5.9 times higher than that of the observed value in Japanese workplaces. However, when sensitivity (percent of the subjects who will actually develop coronary heart disease identified and assigned to the high-risk group) and specificity (percent of the subjects who will not actually develop coronary heart disease identified and assigned to the normal groups) were compared at various cutoff values, the best result was obtained at the 14.5 % high-risk cutoff value, yielding 70 % sensitivity and 82 % specificity and making it appear to be an appropriate tool for the purpose of identifying a high-risk group.

Fig. 2: CPAP Flowchart



(Source) Takatsuki Health Service Center, Matsushita Electric Industrial Co., Ltd.

However, when the screening was put into practice with this cutoff value, it resulted in approximately 20 % of the subject employees being identified for the high-risk group. This meant that about one in five employees would have to have been re-assigned to a lower workload status. Consequently, after much consultation, it was decided that only those with 20 % and higher CHD risk would be classified as the high-risk group, and those with 15 to 19 % CHD risk would be classified instead as a pre-high-risk group. These employees were given a limited intervention such as written guidance for a lifestyle modification, but would not be re-assigned. When subjects with 20 % and more CHD risk were classified as the high-risk group, the sensitivity dropped to 50 % but the specificity increased to 90 %. While nearly half of the pre-myocardial infarction and pre-cardiac angina cases would still be picked up with this criterion, only 5 % of the subject employees fell under the high risk category.

The risk calculation software is also used as a “what if” motivation tool for health guidance. By changing the values for each evaluation item (total cholesterol, HDL-cholesterol, systolic blood pressure, diastolic blood pressure, diabetes (including borderline cases), and current smoking habit) and then recalculating the CHD risk, the risk reduction from the improved evaluation item can be shown to each worker.

Ultrasound Of The Carotid Arteries

Most of the time cardiovascular disease in the workplace is asymptomatic and yet it is essential to implement prevention, treatment, and labor management at the early stages of arteriosclerosis, before the occurrence of a major cardiac event such as an acute myocardial infarction. Accordingly, each high-risk worker with 20% or greater CHD risk was offered an ultrasound of the carotid arteries in the CPAP. This procedure uses thickening of IMCT (Intima-media complex thickness) as an indication of arteriosclerosis and is an important factor for decision making in conjunction with the CHD risk evaluation. As a result of the ultrasound procedure, half of the high-risk workers with 20 % or more CHD risk were found to have some sort of significant arteriosclerotic lesion.

Lifestyle Modification Table

In this company, it is a fundamental principle to follow the

worker’s free will for decision making on the items included in the lifestyle improvement program, including smoking cessation guidance and prescription for exercise. When discussing the lifestyle improvement program for each subject worker, a Lifestyle Modification Table (see Fig. 3), designed by the Health Service Center is used.

This table consists of 16 diet related items (including smoking and drinking), three recreation related items, and six exercise related items, and indicates goals for a healthier lifestyle. The Lifestyle Modification Table is written on a white board and the employee then places paper strips bearing each item, on the board. The columns on the right indicate “currently accomplished” or “confident of accomplishing” while the columns on the left indicate “unable to accomplish” or “unwilling to accomplish”. When a goal is marked accomplished, a circle is drawn on it and the health management personnel will basically no longer intervene. If there is any item the employee is absolutely unwilling to change or adopt, the item is crossed out. For instance, if someone says “I enjoy drinking very much and would rather die than stop drinking”, he/she is asked to cross out the drinking-related goals and the health management personnel refrains from further intervention. Because forced intervention may provoke a feeling of antipathy, this program does not compel subject employees to do things which they are not willing to do and instead allows them to be how they are. For example, an employee who is not willing to stop drinking but who thinks it is possible to stop smoking decides on the feasible items from the discussion and circles those items on the table. Subsequently, an individually customized health guidance leaflet will be written including, for example, baseline physical measurements if he/she wants to start exercising, consultation about healthy recreation, and an appropriate smoking cessation aid (i.e. education only or nicotine patch and gum, etc.). The employee is then asked to draw an arrow toward the right from the selected feasible item to indicate their degree of commitment and a specific goal is decided together with the health management personnel. For example, a specific and attainable goal is set such as “I will not finish eating my lunch before Mr. (Ms.) X finishes” to accomplish the goal of “eating slowly”. The number of goals is limited to not more than three at a time because too many goals often reduces the chance of success. Explanatory materials for each item are written in a leaflet, newly created by the Health Service Center.

Fig. 3: Lifestyle Modification Table

	← Unable to accomplish Unwilling to accomplish (X)			→ Currently accomplished (O) Confident of accomplishing
Diet and smoking	Stop smoking			
				Eat three regular meals a day ○
				Eat more than 30 different foods a day
			Eat in moderation	
				Eat not more than one bowl of rice per meal ○
		Limit salt intake		
		Limit alcohol consumption to 180 ml per day		Avoid snacks
	X Give my liver a day of rest			Eat less deep fried foods
	X Stop drinking alcohol		Eat plenty of vegetables (300 g per day)	
			Eat more red/dark meat fish	
Recreation		Eat more slowly		Avoid eating after the B shift (i.e. the late shift)
		Go out eating and drinking less often		Avoid being too particular about foods ○
	Avoid eating two hours before going to bed			
			Avoid soft drinks	
		Pursue healthy hobbies		
				Get sufficient sleep
Exercise		Once a week	Two to three times a week	Everyday
		Exercise		
			Exercise on holidays	
		Perform 30 minutes or more exercise at a time		
	Avoid using the car and motorbike for commuting			
Walk to work				
	Use LLCC fitness center			

(Source) Takatsuki The Health Service Center, Matsushita Electric Industrial Co., Ltd.

Results of the 2000 Fiscal Year

There were 102 employees determined to be at high-risk by the CHD risk evaluation and 52 of these had medical findings in carotid artery ultrasound, exercise electrocardiogram, or other medical test. After participating in the CPAP program for 3 months, 36 showed a reduction in CHD risk, 13 had aggravation in their CHD risk and 3 remained at the same risk level. Of those 52, seven participants accepted a change in workload, while the rest were determined to be capable of maintaining

their current workload.

The Health Service Center feels their CPAP is valuable, allowing them to handle everything from medical checkup, health guidance, treatment, to adjustments in workload, in a consistent manner. By developing and utilizing this program improvements in lifestyle and medical results led to a significant risk reduction among employees, while at the same time providing consistency in necessary workload adjustments.

Reference: Shinya Matsuda and Hiroyuki Sakamaki (ed.) 2004 "Practice of Japanese Style Disease Management Model" (Jiho, Inc)

Activities at Healthcare Committee Co., Ltd.

Healthcare Committee Co., Ltd. (hereinafter called "HCC") is a specialized company promoting preventative medicine. Targeting health services for large employers' self-insured health insurance societies, HCC is conducting disease prevention projects aimed at prevention and management of lifestyle-related diseases jointly with university hospitals such as the University of Tokyo Hospital, general medical facilities, and health insurance societies.

History

Since the late 90s, the government, universities, and research institutes have been cooperatively studying methodologies of lifestyle-related disease prevention through an analysis of high medical expense factors in medical claims data and review of the health services for primary prevention among subjects from National Health Insurance, the regional public health insurance system in Japan.

Previously a number of health insurance societies interested in this field initiated a study group with Dr. Yuji Furui from the University of Tokyo Hospital, currently President of HCC. In 2001, the "Association to Promote Insurer Functions" (hereinafter called "APIF") was established by 60 health insurance societies. This association promotes the role of the payer as a provider of health information services and education for patients, as well as conducting specific prevention projects under partnerships with medical institutions. At present, APIF's members comprise 98 health insurance societies which together insure approximately 6,250,000 members, including dependents.

Between fiscal year 2001 and 2002, the APIF conducted a study regarding how health insurance societies can provide

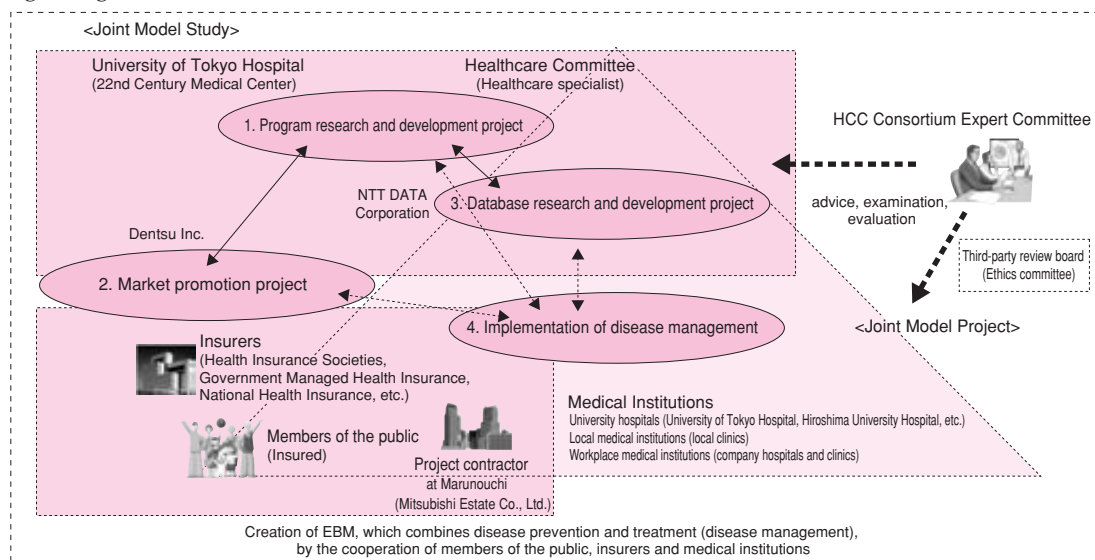
information of medical institutions to their members. This study was funded by a Health and Labor Sciences Research grant (principal investigator, Prof. Kazuhiko Ohe, University of Tokyo Hospital)ⁱ.

Following this study, specialized organizations were established for the purpose of supporting the insurer's activities in prevention projects, including HCC and the University of Tokyo Hospital 22nd Century Medical Center (hereinafter called the "22nd Century Medical Center"). HCC was founded in June 2003 with financial contributions from like-minded researchers. The 22nd Century Medical Center has been offering specific courses since June 2004 with donations from a number of business enterprises as a business/academic collaboration institute under the newly incorporated National Universities (this is the new status of the national universities who are now encouraged to cooperate openly with private enterprise).

A number of university hospitals, general hospitals, and business enterprises including HCC and the University of Tokyo Hospital have established a consortium as a government project which is currently conducting the "Health and Disease Management Model Study Project" (hereinafter called the "Model Project") aiming at prevention and management of lifestyle-related diseases on subjects from 20 health insurance societies including the APIF members. This project has been carried out with a grant from the Ministry of Economy, Trade and Industry as a progressive approach leading toward the creation of a new health service industryⁱⁱ.

i: "Model Study Project on the Role of the Insurer" with a Health and Labor Sciences Research (chief researcher, Prof. Kazuhiko Ohe from the University of Tokyo Hospital)

Fig. 4: Organization Structure of the HCC Consortium



(Source) [Ministry of Economy, Trade and Industry: Creation of Health Service Industry Supporting Project (Health Service Industry Model Project) in fiscal year 2004], from HCC Consortium Expert Committee materials

ii: Ministry of Economy, Trade and Industry “Research and Study Project on Evidence Based Health Promotion (EBH)” in fiscal year 2003. Ministry of Economy, Trade and Industry “Creation of Health Service Industry Supporting Project” in fiscal year 2004

Outline of Model Project

1. Model Project Activities

The Model Project activities include development of a prevention program and its trial, awareness promotion, market promotion, and database construction. The following are the details of the activities.

(1) Development of the Prevention Program

Develop a specialist education program, an implementation program for subjects, a health awareness promotion program, and a project evaluation program for the purpose of conducting effective prevention.

(2) Implementation of the Prevention Project

Conduct such a prevention project on employee subjects from approximately 20 health insurance societies with collaboration among the insurers, health and medical institutes.

(3) Awareness Promotion and Market Promotion

In order to promote a new market, provide information on the importance of effective prevention of diseases, including lifestyle-related diseases, and program implementation details by planning and organizing prevention symposiums, seminars for insurer management personnel, workshops for insurer specialist personnel, as well as by developing and publishing pamphlets.

(4) Database Construction

Construct a database for effective prevention and its evaluation to enable smooth execution of the program, leading to improvement through the evaluation and feedback of the results.

2. Organization Structure

The Model Project is conducted by the “HCC Consortium”, a coalition composed of HCC (the project manager), several university hospitals including the University of Tokyo Hospital, health insurance societies, and medical institutions (see Fig. 4).

The prevention program development is jointly carried out by HCC and several university hospitals. They cooperatively develop and perform primary prevention, i.e., a health and

disease management program for those in the gray zone of lifestyle-related diseases (mainly for disease prevention), as well as tertiary prevention, i.e., a health and disease management program for those who already have lifestyle-related diseases (mainly for the prevention of exacerbation and complications). While primary prevention is provided by HCC through its insurers, tertiary prevention is cooperatively provided by medical institutions (university hospitals, and local and company medical clinics), and HCC. Presently, the primary prevention program has been developed and is being conducted while the tertiary prevention program is being prepared for implementation.

Awareness promotion and market promotion is being conducted by Dentsu Inc., Mitsubishi Estate Co., Ltd., and HCC, while database construction is being carried out by HCC, NTT DATA Corporation, and university hospitals. During implementation of the Model Project, the “HCC Consortium Expert Committee” provides advice, examination, and evaluation as an advisory board. The committee is a panel consisting of specialists under the supervision by Dr. Nagai who is a director of the University of Tokyo Hospital. As for the cost of the project, basic research and development expenses are covered by the research funds while actual service expenses are covered by the health services funds.

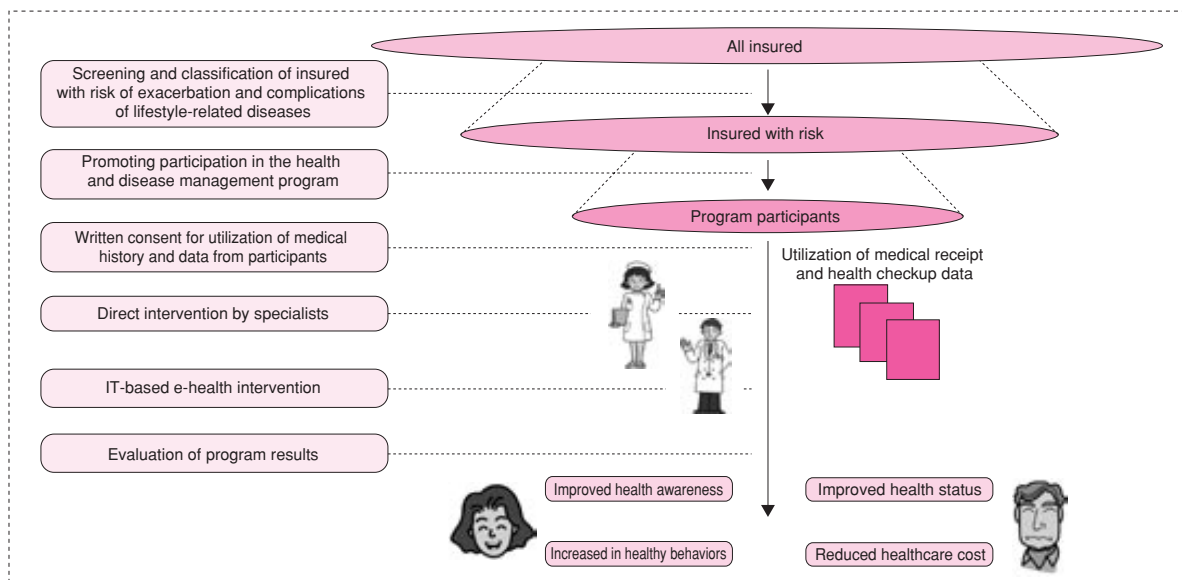
3. Primary Prevention Program Detail

Fig. 5 is a flowchart of the primary prevention program conducted for a six month trial period in 2003. The subjects of the program consisted of those members with lifestyle-related disease risk who were screened from the entire insured membership. The screening for each insurer was conducted by different entities including industrial physicians from the workplace, nurses from the health insurance societies, and HCC.

The method of recruiting participants from the screened high-risk members also differed from insurer to insurer. For those willing to participate in the prevention program, a medical history was recorded and written consent for data utilization was obtained.

The program intervention involved face-to-face guidance by specialist providers and regular contact utilizing IT (i.e. e-health) tools. Each participant set specific goals for improvement. The guidance personnel included approximately 20 specialist providers consisting of registered dietitians, nurses, doctors, etc.

Fig. 5: Flowchart of the Primary Prevention Program



(Source) Lecture materials at board meetings and conferences of health insurance society by HCC

4. Primary Prevention Program Outcomes and Explanation

In one health insurance society which took part in the primary prevention program in 2003, 91 out of 100 participants completed the entire six month program.

The effectiveness was determined by the degree of improvement in medical checkup items and a written survey on changes in lifestyle including diet, exercise, etc. Table 1 shows the change for major medical checkup items where 40 to 70 % of the participants were seen to have an improvement in each item. When the level of achievement was analyzed, a significant improvement was found among those participants who achieved their goal. The survey results obtained from these goal achievers also indicated positive modification in their lifestyle-related thinking and behavior. HCC believes that this change led to the improved medical checkup results.

The above success is attributed to the following three factors: the implementation system, the program and the efforts of individual health insurance societies.

Table 1: Outcome of the "Lifestyle Improvement Guidance"

* Percentage change in comparison with the previous checkup results

Achievement Level	Weight Reduction	Total Cholesterol Reduction	HDL-Cholesterol Increase	Triglyceride Reduction
Achievers (continued guidance not required)	72.7%	63.6%	100.0%	63.6%
Non-achievers	43.8%	50.0%	75.0%	50.0%

* The above results are an interim report. Further analysis and evaluation of results are necessary for the final determination of program effectiveness, which will also depend on the timing of both the start of the program and the annual health checkup.

(Source) Adapted by HCC from its report materials to the health insurance society

5. Future Issues and Developments

According to HCC, there are still a number of remaining issues with the program. First, there were non-achievers among the participants of the fiscal year 2003 program. An effort must be made to increase the ratio of achievers. There is also a plan to provide continuing guidance for the goal achievers utilizing IT such as e-mail newsletters and health e-learning tools, in the future. There also remains the task of expanding the lineup of continuing guidance for ongoing program participants.

The fiscal year 2003 program was intended only for insured individuals, but the future program will include their dependents as well. Employers are obligated to manage health checkups and subsequent health guidance for the insured by the Industrial Safety and Health Law. However, compared with the insured, it may be difficult to manage their dependents and it will be necessary to devise appropriate measures.

Furthermore, for implementation of the health service, there is also a need for infrastructure development such as the construction of a database from medical checkup and complete physical examination data, as well as standardization of the disease risk prediction algorithms and medical checkup information. These topics are currently being examined as a part of another government-sponsored project.

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Editorial Department of Disease Management Reporter in Japan

Attention: Mr. Naonori Yakura
Mailing Address: Sompo Japan Research Institute Inc.
1-26-1 Nishishinjuku, Shinjuku-ku, Tokyo, 160-8338, Japan
E-mail: dmr@sj-ri.co.jp
Tel: +81-3-3348-6147
FAX: +81-3-3348-6146

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