Improving the Annual Health Check-up in Work Places in Japan
at Government, Provider and Company Levels

By

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ABSTRACT

Every employer in Japan has been required to implement annual health check-ups to all the employees by the Occupational Safety and Health Law since 1972; however, effectiveness of the health check-up has not been evaluated periodically. Although some of their items have been revised several times, detecting the risk of stroke / coronary heart disease (CHD) among workers has not been revised for several decades. This paper discusses the problems and solutions associated with the annual health check-up in Japan and recommendations for improving them.

There are several problems with the health check-up. First, most of the evidence from the items of the health check-up, that is, chest X-ray, anemia test, liver function test, electrocardiography, and urine test does not show substantial to moderate net benefit. Second, the disease structure in Japan has changed drastically and cancer has been the leading cause of death since 1980; however, cancer screenings have not been included in the items. Third, the world trend has emphasized primary prevention such as Total Worker Health, and the programs evaluating and improving the work-related factors which may have impact on workers’ well-being. Although the health check-up is considered to be a good opportunity for collecting information about work-related factors such as working hours, these factors have not been included in the items of the health check-up. Fourth, after the health check-up, workers in small enterprises may not have sufficient medical follow-up including healthcare counseling due to the occupational health workforce shortage.

For improving the problems associated with the health check-up, the government should revise the items of the health check-up based on the current scientific evidence, disease structure, the world trend for emphasizing primary prevention, and evaluation of the effectiveness of the revised health check-up periodically by reflecting the current scientific evidence, and then
providing the workers in small enterprises an opportunity for medical follow-up after the health check-up by restoring the occupational health workforce. Service providers such as occupational physicians can improve their skills and knowledge by revising the health check-up, and employers can promote employee health and well-being not only protect worker health.

*Key words: the annual health check-up, work places, Japan*
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CHAPTER 1

INTRODUCTION

In Japan, every employer has been required to implement annual health check-ups to all the employees by the Occupational Safety and Health Law since 1972 (Ministry of Health, Labour and Welfare, 2013). The main purpose of the health check-up is to detect the risk of coronary heart disease / stroke, one of the major work-related diseases in Japan among workers (Ministry of Health, Labour and Welfare, 2008). For preventing the incidence of these diseases, employers also have been required to decrease the workload of the employees with severe risks and have been recommended to provide medical follow-up including occupational physicians’ health counseling since 1996 (Ministry of Health, Labour and Welfare, 2013). Although several research groups evaluated the effectiveness of the health check-up (Ministry of Health, Labour and Welfare, 2002; Ministry of Health, Labour and Welfare, 2005), periodic evaluation has not been implemented.

The disease structure in Japan has changed drastically since 1972 due to rapid aging, change of lifestyle and work environment, advances in medicine, and so on. For example, the death rate from stroke has gradually decreased and that of cancer has rapidly increased since 1970s. Despite of these changes, the purpose of the health check-up has not been revised for several decades. As for medical follow-up, there are great gaps in the services that workers receive between major companies and small enterprises due to the occupational health workforce shortage especially in small enterprises (Kayashima, 2013).

Employers spend much time and money implementing the annual health check-up in work places for the purpose of protecting employee health. However, there are several problems with the annual health check-up in work places in Japan. This paper discusses the problems and
solutions associated with the health check-up and recommendations for improving it according to each stakeholder, that is, the decision-maker (the government), service providers (occupational physicians and occupational health nurses), and service recipients (employers and employees).
CHAPTER 2
LITERATURE REVIEW

Occupational Health Systems in Japan

Of the 3.82 million enterprises in Japan, 3.25 million (85.1%) are small enterprises, with 50 or less employees, and 11,000 (0.3%) are large enterprises, with at least 300 employees (The Small and Medium Enterprise Agency, 2015). Of the 47.94 million employees in Japan, 11.27 million employees (23.5%) work in small enterprises and 14.33 million employees (29.9%) work in large enterprises (The Small and Medium Enterprise Agency, 2015). Although 80,000 physicians (166.9 per 100,000 workers) have the license of the occupational physician (Bureau of Occupational Physicians in the Japan Society for Occupational Health, Japan, 2011), only 1,800 work as full-time occupational physicians (3.8 per 100,000 workers) and the remainder work as part-time or have never worked as an occupational physician (Isse, 2012).

The Occupational Safety and Health Law requires large and medium enterprises with more than 50 employees to contract with occupational physicians to provide occupational health services to the employees including medical follow-up after the health check-up. Under this condition, 11.27 million employees (23.5%), who work in small enterprises (The Small and Medium Enterprise Agency, 2015), may not have any occupational health services including medical follow-up after the health check-up. The health status among workers in small enterprises are generally poorer than those in large enterprises. For example, the prevalence rate of the risk of coronary heart disease / stroke among workers in small enterprises were significantly higher than those in large enterprises in the annual health check-up (Hoshuyama, 2007), and it is important to expand occupational health services to small enterprises. However, even if the 80,000 licensed occupational physicians work as full-time, each physician needs to
cover 4,062 small enterprises. There are great demand-supply gaps between the number of occupational physicians and that of small enterprises.

**The Annual Health Check-ups in Work Places in Japan**

The items of the annual health check-up regulated by the Occupational Safety and Health Law in Japan are shown in Table 2.1. Of these items, HDL cholesterol and plasma glucose test were added in 1998, LDL cholesterol and waist circumference were added in 2008, and total cholesterol was deleted in 2008 to improve the screening test of coronary heart diseases and stroke (Ministry of Health, Labour and Welfare, 2008). Most companies have outsourced the practice of the annual health check-up and medical follow-up to industrial health organizations and occupational physicians, respectively. After the health check-up, medical follow-up including occupational physicians’ counseling is provided to workers with positive results. In the medical follow-up, an occupational physician recommends employees to modify their health risk behaviors and/or take second screening test or treatment. It should also be recognized that some companies do other kinds of health tests such as cancer screenings provided by corporate health societies, and that certain screenings are done for community residents. However, these are voluntary or not mandated with regard to the Occupational Safety and Health Law.

**Evidence of the Health Check-up**

Since 1998, the Agency for Healthcare Research and Quality (AHRQ) has convened the U.S. Preventive Services Task Force (USPSTF), an independent, volunteer panel of national experts in prevention and evidence-based medicine (USPSTF, 2014). The USPSTF conducts rigorous reviews of scientific evidence to create evidence-based recommendations for preventive services that may be provided in the primary care setting (USPSTF, 2014). The recommendation levels are determined by considering the balance of the potential benefits, including early
TABLE 2.1
THE ITEMS OF THE ANNUAL HEALTH CHECK-UP IN JAPAN

1) Past history and job history
2) Subjective and objective symptoms
3) Body height, body weight and waist circumference* †
4) Vision test and audiometric test
5) Chest X-ray
6) Blood pressure
7) Anemia test †; hemoglobin and red blood cell
8) Liver function test †; GOT, GPT and γ-GTP
9) Serum lipid test †; LDL cholesterol*, HDL cholesterol** and triglyceride
10) Plasma glucose test** †
11) Urine test; protein and occult blood
12) Electrocardiogram †

* LDL cholesterol and waist circumference were added in 2008.
** HDL cholesterol and plasma glucose were added in 1998.
† These items can be skipped for adults age <35 years and 36 to 39 years.

<table>
<thead>
<tr>
<th>Screening</th>
<th>Target Population*</th>
<th>Japan**</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Grade A:</strong> The USPSTF recommends the service. There is high certainty that the net benefit is substantial.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cervical cancer (cytology)</td>
<td>Women age 21 to 65 years</td>
<td></td>
</tr>
<tr>
<td>Colorectal cancer</td>
<td>Adults age 50 to 75 years</td>
<td></td>
</tr>
<tr>
<td>High blood pressure in adults</td>
<td>Adult general population</td>
<td>☑️</td>
</tr>
<tr>
<td>Lipid disorders in adults</td>
<td>Men $\geq$ 35 years and women $\geq$ 45 years</td>
<td>☑️</td>
</tr>
<tr>
<td></td>
<td></td>
<td>†</td>
</tr>
<tr>
<td><strong>Grade B:</strong> The USPSTF recommends the service. There is high certainty that the net benefit is moderate or there is moderate certainty that the net benefit is moderate to substantial.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Alcohol misuse</td>
<td>Adults age 18 years or older</td>
<td></td>
</tr>
<tr>
<td>Breast cancer (Mammography)</td>
<td>Women age 50-74 years</td>
<td></td>
</tr>
<tr>
<td>Depression in adults</td>
<td>Non pregnant adults 18 years or older</td>
<td></td>
</tr>
<tr>
<td>Type 2 diabetes mellitus</td>
<td>Asymptomatic adults with high blood pressure $\ddagger$</td>
<td>☑️</td>
</tr>
<tr>
<td>Hepatitis C virus infection</td>
<td>Persons at high risk for infection</td>
<td></td>
</tr>
<tr>
<td>Lung cancer (low-dose computed tomography)</td>
<td>Asymptomatic adults aged 55 to 80 years $\S$</td>
<td></td>
</tr>
<tr>
<td>Obesity in adults</td>
<td>Adults age 18 years or older</td>
<td>☑️</td>
</tr>
<tr>
<td>Osteoporosis</td>
<td>Women age $&lt;65$ years with high fracture risk</td>
<td></td>
</tr>
<tr>
<td><strong>Grade C:</strong> The USPSTF recommends selectively offering or providing this service to individual patients based on professional judgment and patient preferences. There is at least moderate certainty that the net benefit is small.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Type 2 diabetes mellitus</td>
<td>Asymptomatic adults without high blood pressure $\ddagger$</td>
<td>☑️</td>
</tr>
<tr>
<td><strong>Grade D:</strong> The USPSTF recommends against the service. There is moderate or high certainty that the service has no net benefit or that the harms outweigh the benefits.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Carotid artery stenosis</td>
<td>Adult general population</td>
<td></td>
</tr>
<tr>
<td>Chronic obstructive pulmonary disease</td>
<td>Adult general population</td>
<td></td>
</tr>
<tr>
<td>CHD (Electrocardiography)</td>
<td>Asymptomatic adults</td>
<td>☑️</td>
</tr>
<tr>
<td>Hemochromatosis</td>
<td>Asymptomatic general population</td>
<td></td>
</tr>
<tr>
<td>Ovarian cancer</td>
<td>Asymptomatic women without known</td>
<td></td>
</tr>
</tbody>
</table>
Prostate cancer  
Grade I: The USPSTF concludes that the current evidence is insufficient to assess the balance of benefits and harms of the service. Evidence is lacking, of poor quality, or conflicting, and the balance of benefits and harms cannot be determined.

<table>
<thead>
<tr>
<th>Condition</th>
<th>Target Population</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prostate cancer</td>
<td>Adult males</td>
</tr>
<tr>
<td>Bladder cancer</td>
<td>Asymptomatic adults</td>
</tr>
<tr>
<td>Chronic kidney diseases</td>
<td>Asymptomatic adults</td>
</tr>
<tr>
<td>CHD (Nontraditional risk factors)</td>
<td>Asymptomatic adults</td>
</tr>
<tr>
<td>Glaucoma</td>
<td>Adults without vision symptoms</td>
</tr>
<tr>
<td>Hearing loss in older adults</td>
<td>Asymptomatic adults age 50 years or older</td>
</tr>
<tr>
<td>Oral cancer</td>
<td>Asymptomatic adults age 18 years or older</td>
</tr>
<tr>
<td>Peripheral artery disease</td>
<td>Asymptomatic adults</td>
</tr>
<tr>
<td>Skin cancer</td>
<td>Adult general population</td>
</tr>
<tr>
<td>Suicide risk</td>
<td>General population</td>
</tr>
</tbody>
</table>

*Targeted adult general population age 18-65 years; younger or older population and pregnant women were not included.

**The items included in the annual health check-ups in work places in Japan.

† Women ≥ 45 years at increased risk for coronary heart disease (CHD).

‡ Sustained blood pressure greater than 135/80 mmHg.

§ Asymptomatic adults aged 55 to 80 years who have a 30 pack-year smoking history and currently smoke or have quit smoking within the past 15 years.

Source: USPSTF, 2014
identification of disease leading to improvement in health, and the potential harms, including adverse effects of the service itself or inaccurate test results that may lead to additional testing and risks, or unneeded treatment (USPSTF, 2014). Table 2.2 shows USPSTF recommendations for screening tests for the general adult population, excluding recommendations for pregnant women and younger (<18 years) or older (≥65 years) populations. Of the 28 screening tests, 12 were categorized as grade A or B (recommended for the service), 1 was categorized as grade C (selectively recommended for the service), 6 were categorized as grade D (recommended against the service), and 9 were categorized as grade I (insufficient evidence for recommendation). For comparing the items in the USPSTF and the health check-up in Japan, the corresponding items in Japan were added in Table 2.2.

The health counseling was not shown in Table 2.2, but behavioral counseling interventions to promote a healthful diet and physical activity for cardiovascular disease were categorized as grade C for implementing them for the general adult population without a known diagnosis of hypertension, diabetes, hyperlipidemia, or cardiovascular disease (USPSTF, 2014).

**Change of the Disease Structure in Japan**

The disease structure in Japan has changed drastically since 1972 due to rapid aging, change of lifestyle (westernization), and advances in medicine. As shown in Figure 2.1, the death rate from stroke, the leading cause of death in Japan in 1972, has decreased gradually and became the third leading cause of death in 1985. On the other hand, the death rate of cancer, the second leading cause of death, has rapidly increased and has been the leading cause of Japanese death since 1980.

The percentages of each cause of death according to age in the Japanese population in 2011 are shown in Figure 2.2. For men age 45 years or older and women age 35 years or older,
FIGURE 2.1

ANNUAL CHANGE IN DEATH RATE OF JAPANESE

ACCORDING TO THE CAUSE OF DEATH

Death rate
(per 100,000 population)

FIGURE 2.2

CAUSE OF DEATH ACCORDING TO AGE IN JAPAN IN 2011

cancer is the leading cause of death.

**The World Trend for Emphasizing Primary Prevention**

Based on the health-related statistics in Japan such as cause of death and disability-adjusted life years (DALYs) (Table 2.3), the government has planned to promote primary prevention. "Health Japan 21" is a 10-year national campaign intended to promote healthy behaviors of the national population and build healthy environments with actions from communities, worksites, health professionals and other related organizations by establishing and sharing the national objectives (Matsuda, 2007). Its first period was 2001 to 2010 and its second period is 2011 to 2020. Based on scientific research and public debates, the government set basic goals (Table 2.4) and indicators (Table 2.5) in the following nine areas; food and nutrition, physical activities, mental health, tobacco, alcohol, oral health, diabetes, cardiovascular diseases, and cancer. However, there are no requirements for employers regarding these basic goals and indicators, and they are not associated with the Occupational Safety and Health Law at all.

As the primary prevention approach among workers in the U.S., the National Institute for Occupational Safety and Health (NIOSH) launched the Total Worker Health (TWH) initiative in 2011. Total Worker Health is defined as policies, programs, and practices that integrate protection from work-related safety and health hazards with promotion of injury and illness prevention efforts to advance worker well-being (NIOSH, 2015). Figure 2.3 illustrates a wide-ranging list of issues that are relevant to advancing worker well-being through a Total Worker Health approach including those relevant to the control of hazards and exposures, the organization of work, compensation and benefits, built environment supports, leadership, changing workforce demographics, policy issues, and community supports (NIOSH, 2015).
### TABLE 2.3

**BURDEN OF DISEASE IN JAPAN IN 1993**

**BASED ON DISABILITY-ADJUSTED LIFE YEARS (DALYS)**

<table>
<thead>
<tr>
<th>Disease</th>
<th>DALY%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cancer</td>
<td>19.6%</td>
</tr>
<tr>
<td>Depression</td>
<td>9.8%</td>
</tr>
<tr>
<td>Stroke</td>
<td>8.6%</td>
</tr>
<tr>
<td>Accident</td>
<td>7.0%</td>
</tr>
<tr>
<td>Coronary Heart Disease</td>
<td>4.9%</td>
</tr>
<tr>
<td>Osteoarthritis</td>
<td>3.5%</td>
</tr>
<tr>
<td>Pneumonia</td>
<td>3.3%</td>
</tr>
<tr>
<td>Suicide</td>
<td>3.2%</td>
</tr>
<tr>
<td>Schizophrenia</td>
<td>2.5%</td>
</tr>
<tr>
<td>Liver Cirrhosis</td>
<td>1.9%</td>
</tr>
<tr>
<td>Diabetes</td>
<td>1.8%</td>
</tr>
<tr>
<td>Bronchial Asthma</td>
<td>1.7%</td>
</tr>
<tr>
<td>Birth Defect</td>
<td>1.3%</td>
</tr>
<tr>
<td>Chronic Rheumatism</td>
<td>1.2%</td>
</tr>
<tr>
<td>Dental Problems</td>
<td>1.0%</td>
</tr>
<tr>
<td>Renal Failure</td>
<td>1.0%</td>
</tr>
<tr>
<td>Chronic Obstructive Pulmonary Disease</td>
<td>0.8%</td>
</tr>
<tr>
<td>Dementia</td>
<td>0.7%</td>
</tr>
</tbody>
</table>

| 1) | Extension of healthy life expectancy and reduction of health disparities. |
| 2) | Prevention of onset and progression of life-style related diseases (prevention of NCD*). |
| 3) | Maintenance and improvement of functions necessary for engaging in social life. |
| 4) | Establishment of a social environment where health of individuals is protected and supported. |
| 5) | Improvement of social environment and such life-style as nutrition and dietary habits, physical activity and exercise, rest, alcohol drinking, tobacco smoking, and oral health. |

* Cancer, cardiovascular disease, diabetes, and COPD are categorized as lifestyle-related diseases in Japan. Internationally, these four diseases are regarded as non-communicable diseases (NCD), and the necessity to implement comprehensive program for prevention and control of NCD is stressed.

### TABLE 2.5

**INDICATORS IN THE NINE AREAS FOR NATIONAL HEALTH PROMOTION**

**(1) Cancer**  
1. Reduction in age-adjusted mortality rate of cancer under age 75 (per 100,000)  
2. Increase in participation rate of cancer screenings

**(2) Cardiovascular Disease**  
1. Reduction in age-adjusted mortality rate of cerebrovascular disease (CVD) and ischemic heart disease (IHD) (per 100,000)  
2. Improvement of hypertension (reduction in average systolic blood pressure)  
3. Reduction in percentage of adults with dyslipidemia  
4. Reduction in number of definite and at-risk people with metabolic syndrome  
5. Increase in participation rates of specified health checkups and specified health guidance

**(3) Diabetes**  
1. Reduction in complications (number of patients newly introduced to dialysis due to diabetic nephropathy)  
2. Increase in percentage of patients who continue treatment  
3. Decrease in percentage of individuals with elevated blood glucose levels (HbA1c (NGSP) ≥ 8.4%)  
4. Prevent increase in number of diabetic persons  
5. Reduction in number of definite and at-risk people with metabolic syndrome  
6. Increase in participation rates of specified health checkups and health guidance

**(4) Mental health**  
1. Reduction in suicide rate (per 100,000)  
2. Decrease in percentage of individuals who suffer from mood disorders or anxiety disorders  
3. Increase in percentage of occupational settings where interventions for mental health are available

**(5) Nutrition and dietary habits**  
1. Increase in percentage of individuals maintaining ideal body weight (Reduction in percentage of obese individuals [BMI 25 and more] and underweight individuals [BMI less than 18.5])  
2. Increase in percentage of individuals who consume appropriate quality and quantity of food  
3. Increase in number of corporations in food industry that supply food product low in salt and fat  
4. Increase in percentage of specific food service facilities that plan, cook, and evaluate and improve nutritional content of menu based on the needs of clients

**(6) Physical activity and exercise**  
1. Increase in daily number of steps  
2. Increase in percentage of individuals who regularly exercise
3. Increase in number of local governments that offer community development and environment to promote physical activity

(7) Alcohol drinking
1. Reduction in percentage of individuals who consume alcohol over recommended limits (male > 40 g, female > 20 g per day)

(8) Tobacco smoking
1. Reduction in percentage of adult smoking rate
2. Eradication of underage smoking
3. Reduction in percentage of individuals who are exposed to passive smoking at home, workplace, restaurants, governmental institutions, and medical institutions

(9) Dental and Oral health
1. Maintenance and improvement of oral function (increase in percentage of individuals in their 60s with good mastication)
2. Prevention of tooth loss
3. Decrease in percentage of individuals with periodontal disease
4. Increase in percentage of individuals who participated in dental check-up during the past year

FIGURE 2.3

ISSUES RELEVANT TO ADVANCING WORKER WELL-BEING THROUGH TOTAL WORKER HEALTH

Source: NIOSH, 2015
CHAPTER 3
ANALYSIS OF LITERATURE REVIEW

Most of the items of the annual health check-up in Japan were unchanged for several decades. The balance of the potential benefits and hazards has been changed owing to the advances in medicine. The USPSTF 2014 (Table 2.2) recommended the following screening tests: cervical cancer, colorectal cancer, high blood pressure, lipid disorder, alcohol misuse, breast cancer (mammography), depression, type 2 diabetes mellitus, hepatitis C virus infection, lung cancer (low-dose computed tomography), obesity, and osteoporosis. Of these, only four screenings, that is, high blood pressure, lipid disorder, type 2 diabetes mellitus, and obesity, are included in the health check-ups in Japan. However, the remaining eight screenings, that is, cervical cancer, colorectal cancer, alcohol misuse, breast cancer (mammography), depression, hepatitis C virus infection, lung cancer (low-dose computed tomography), and osteoporosis, are not included in the health check-ups in Japan. In addition, the following eight screenings included in the health check-up in Japan are not recommended in the USPSTF 2014: job history, subjective and objective symptoms, vision and audiometric test, chest X-ray, anemia test, liver function test, urine test, and electrocardiogram. The items in the annual health check-up should be revised based on the current scientific evidence and items with more potential hazards such as electrocardiography should be eliminated.

Stroke was the leading cause of death in Japan in 1972 which has decreased with cancer increasing as the leading cause of death in 1980. As for death rate according to age, cancer was the leading cause of death in 2011 among workers age 40 years or more. In addition, the following cancer screenings, categorized as grade A or B (recommend for the services) by the USPSTF 2014, cervical cancer, colorectal cancer, breast cancer, hepatitis C virus infection and
lung cancer (low-dose computed tomography) are not being done. The annual health check-up should include not only detecting work-related diseases but protecting and promoting worker health, and several effective cancer screenings should be added to the health check-up.

Although screening is an important tool for secondary prevention, it targets only workers with severe risks. The world trends have included not only secondary prevention but more emphasis on primary prevention such as “Health Japan 21” (Matsuda, 2007) and Total Worker Health (NIOSH, 2015). The annual health check-up seems to be a good opportunity for collecting this important work-related information and may be useful for implementing effective primary prevention among work places and improving the work environment.

For expanding the occupational health services including medical follow-up to small enterprises, it is important to restore the occupational health workforce. In Japan, only the occupational physician is the qualified occupational health professional by the Occupational Safety and Health Law; however, the number of licensed occupational physicians is limited. There are 1.54 million licensed nurses (Ministry of Health Labour and Welfare, 2014) who work at hospitals (61%), clinics (21%), nursing home (10%), home-visit nursing (2%), schools (2%) and others (1%), including a limited numbers of occupational health nurses who work in large companies. On the other hand, 710,000 licensed nurses are unemployed in Japan (Ministry of Health Labour and Welfare, 2014). For restoring the occupational health work force, it will be effective to facilitate the use of these licensed but unemployed nurses. For achieving this, the law should qualify occupational health nurses as occupational health professionals and require employers of small enterprises to contract with them. In addition, official training and certification of occupational health nurses should be provided to licensed nurses similar to occupational physicians.
CHAPTER 4
RECOMMENDATIONS AND CONCLUSION

Recommendations

There are several recommendations at each level of stakeholders, that is, the government and MHWL (decision-maker), occupational physicians and occupational health nurses (service providers), and employers and employees (recipients of the services). First, at the decision maker level, the government should revise the items of the health check-up based on the current scientific evidence, change of the disease structure and advances in medicine, and the world trends of emphasizing primary prevention (Table 4.1). As for the current scientific evidence, some items not categorized as recommended for the service, for example, electrocardiogram, chest X-ray, anemia tests and liver function tests, should be eliminated from the health check-up. With regard to the disease structure and advances in medicine, some cancer screenings categorized as recommended for the service, for example, cervical cancer, colorectal cancer, breast cancer, hepatitis C virus infection, and lung cancer (low-dose computed tomography), should be added to the health check-up. As for primary prevention, information of some important work-related factors, for example, hours of work, workload and stress levels, and interactions with coworkers, should be added to the health check-up. Second, for periodic review and revision of the health check-up items, the government should establish an independent task force that consists of experts of preventive medicine such as occupational physicians, epidemiologists, and clinicians. Third, the government should evaluate the effectiveness of the annual health check-up by reflecting the current scientific evidence, periodically. Fourth, for providing occupational health services including medical follow-up after the health check-up, the occupational health work force should be restored by facilitating the use of qualified
occupational health nurses.

At service provider level, providers should emphasize implementation of the health check-ups or medical follow-up based not solely on the law but on providing proactive services, such as improvement of the work environment to their patients/clients. Service providers should have continuous training for improving their skills and knowledge, especially for primary prevention strategies such as fatigue and stress prevention programs. For restoring the occupational health workforce, the Association of Occupational Health Nurses should provide basic occupational health training programs for a number of licensed nurses and include opportunities for certification.

For service recipient level, every employer needs to implement strategies to promote their employee health and well-being, including improvement of the work environment, as well as protecting worker health by coordinating with occupational physicians and occupational health nurses.

Conclusion

The annual health check-up in work places in Japan were nearly unchanged since 1972 despite the change of scientific evidence, disease structure, advances in medicine, and the world trend for emphasizing primary prevention (Matsuda, 2007; NIOSH, 2015). In addition, occupational health services including medical follow-up after the health check-up have not been provided to small enterprises due to the occupational health workforce shortage. The government should revise the items and purpose of the health check-up based on the change of surroundings and also provide occupational health services to small enterprises by facilitating the use of qualified occupational health nurses. Although service providers (occupational physicians) and service recipients (employers) have implemented the health check-up and medical follow-up
<table>
<thead>
<tr>
<th>Items which should be unchanged</th>
<th>Items which should be eliminated</th>
<th>Items which should be added</th>
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</thead>
<tbody>
<tr>
<td>High blood pressure screening</td>
<td>Chest X-ray</td>
<td>Cervical cancer screening</td>
</tr>
<tr>
<td>Lipid disorder screening</td>
<td>Anemia test</td>
<td>Colorectal cancer screening</td>
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<tr>
<td>Type 2 diabetes mellitus screening</td>
<td>Liver function test</td>
<td>Alcohol misuse screening</td>
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<tr>
<td>Obesity screening</td>
<td>Urine test</td>
<td>Breast cancer screening (mammography)</td>
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<td>Past history</td>
<td>Electrocardiogram</td>
<td>Depression screening</td>
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<td>Job history</td>
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<td>Hepatitis C virus infection screening</td>
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<td>Subjective and objective symptoms</td>
<td></td>
<td>Lung cancer screening (low-dose computed tomography)</td>
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<tr>
<td>Vision and audiometric test</td>
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<td>Osteoporosis screening</td>
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<td>Work-related information</td>
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based on the law for a long period of time, they should expand the laws and incorporate strategies for promoting employee health and well-being beyond the current regulations.
REFERENCES


