

Guideline Interpretation

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Abstract

Hearing problems currently affect a large population worldwide and are characterized by distribution across all age groups, an age-related increase in prevalence, and a high proportion of preventable cases, making them an important public health issue. As the “gatekeepers” of residents’ health, general practitioners play an irreplaceable role in the early screening of hearing health, intervention for risk factors, and health education. The Guidelines for Preventive Activities in General Practice (10th Edition) issued by the Royal Australian College of General Practitioners (RACGP) (hereinafter referred to as the “Red Book”) provides systematic recommendations for prevention and assessment of hearing problems in general practice. Focusing on hearing problems in the “Red Book,” this article provides an in-depth analysis of the core responsibilities of general practitioners in hearing health management, including opportunistic identification of hearing problems, preliminary assessment, preventive health advice, and referral when necessary. It aims to provide a clear action framework for hearing-related preventive activities in general practice. By integrating epidemiological data on hearing loss from China and abroad with relevant research evidence, this article offers an in-depth interpretation of the core content of the “Red Book” and analyzes the significance of hearing screening and assessment, with the aim of improving China’s primary-level hearing health prevention system and implementing targeted interventions for high-risk populations. This has important practical significance for reducing the disease burden of hearing impairment and improving residents’ quality of life.

Full Text

Guideline Interpretation

Interpretation and Discussion of the Royal Australian College of General Practitioners’ *Guidelines for Preventive Activities in General Practice*: Hearing Problems

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[Abstract] At present, hearing problems affect a vast population worldwide and are characterized by distribution across all age groups, increasing prevalence

lence with age, and a high proportion of preventable cases; they have become an important public health issue. As the “gatekeepers” of residents’ health, general practitioners play an irreplaceable role in early hearing-health screening, risk-factor intervention, and health education. The Royal Australian College of General Practitioners (RACGP) issued the *Guidelines for Preventive Activities in General Practice* (10th edition) (hereinafter referred to as the “Red Book”), which provides systematic recommendations for the prevention and assessment of hearing problems. This article focuses on hearing problems in the “Red Book” and provides an in-depth analysis of the core responsibilities of general practitioners in hearing-health management, including opportunistic identification of hearing problems, initial assessment, preventive health advice, and referral when necessary. It aims to provide a clear action framework for hearing-related preventive activities in general practice. By integrating epidemiological data on hearing loss from China and abroad with relevant research evidence, this article offers an in-depth interpretation of the core content of the “Red Book” and analyzes the significance of hearing screening and assessment, so as to improve China’ s primary hearing-health prevention system and implement targeted interventions for high-risk populations, which is of great practical significance for reducing the disease burden of hearing loss and improving residents’ quality of life.

[Key words] Hearing; Hearing loss; General practice; Prevention; Screening; Royal Australian College of General Practitioners; Public health

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Interpretation and Discussion of the RACGP Guidelines for Preventive Activities in General Practice: Hearing Problems

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[Abstract] At present, the scale of hearing problems is huge worldwide, and it is characterized by all age distribution, increasing with aging, and high preventable proportion, which has become an important public health problem. As the “gatekeeper” of residents’ health, general practitioners play an irreplaceable role in early hearing health screening, risk factor intervention and health education. The Royal Australian College of General Practitioners (RACGP) issued

the “Guidelines for Preventive Activities in general Practice (10th edition)” (hereinafter referred to as the “Red Book”) for the prevention and evaluation of hearing problems in general practice. This article focuses on hearing problems in the Red book and provides an in-depth analysis of the core responsibilities of general practitioners in hearing health management, including opportunistic identification of hearing problems, initial assessment, preventive health advice, and referral when necessary, aiming to provide a clear action framework for hearing related prevention activities in general practice. Combined with the epidemiological data and relevant research evidence of hearing loss at home and abroad, this paper deeply interprets the core content of the “Red Book” and analyzes the significance of hearing screening and assessment, so as to improve the primary hearing health prevention system in China and carry out targeted intervention for high-risk groups, which is of great practical significance for reducing the disease burden of hearing loss and improving the quality of life of residents.

[Key words] Hearing; Hearing loss; General practice; Prevention; Screening; Royal Australian College of General Practitioners

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Practitioners (RACGP); Public health

Hearing loss is a highly prevalent chronic sensory disability worldwide. It can occur in newborns, children, adolescents, adults, and older adults. It not only leads to reduced hearing function, but is also closely associated with delayed language development, social isolation, anxiety and depression, cognitive decline, and increased risk of falls, seriously affecting individuals' quality of life and imposing a heavy socioeconomic burden. Data from the World Health Organization show that hearing loss has become an important contributor to the global burden of disease, while more than half of hearing loss in adults and older adults can be effectively prevented through control of risk factors.

The *Guidelines for Preventive Activities in General Practice* (10th edition) issued by the Royal Australian College of General Practitioners (RACGP) (here-

inafter referred to as the “Red Book”) is based on evidence and general practice experience. From the perspective of preventive activities in general practice, it systematically summarizes recommendations on screening, case finding, and prevention of hearing loss, including screening principles, stratified management strategies, and multidimensional preventive measures. These recommendations have important reference value for building a primary-level hearing-loss prevention system suited to China’s national conditions, and provide an important theoretical basis and practical approaches for general practitioners to carry out hearing health management.

As medical-service professionals who are closest to community residents and most accessible to them, general practitioners have irreplaceable advantages in early detection of hearing problems, accurate diagnosis, provision of individualized prevention strategies and lifestyle advice, and management of high-risk populations. However, in China’s primary medical and health institutions, hearing health management still faces problems such as insufficient awareness of prevention, inconsistent screening strategies, fragmented interventions, and a lack of standardized guidance for general practitioners. It is therefore necessary to interpret the relevant contents of the “Red Book” in depth, so as to guide general practitioners in better carrying out hearing health services.

1 Hearing-problem-related sections in the “Red Book”

The causes of deafness are diverse, and the problems present in different populations vary. Screening recommendations should therefore be made from the perspectives of different population groups. From the perspective of population stratification, the “Red Book” proposes differentiated screening recommendations, specifically covering newborns, children, adults—especially older adults—Indigenous Australians, Torres Strait Islanders, and other special populations. At the same time, it takes into account the effects of congenital factors, such as heredity and infection during pregnancy, and acquired factors, such as otitis media, noise exposure, and ototoxic drug use, on hearing health in different populations, thereby ensuring that screening recommendations are targeted and practical.

1.1 Recommendations of the “Red Book” for general practitioners

1.1.1 Recommendations on hearing screening Current evidence is insufficient to demonstrate that the benefits of routine screening for asymptomatic adults aged ≥ 50 years clearly outweigh the potential harms. Therefore, the “Red Book” generally does not recommend routine screening in this population [1]. This recommendation is based on the conclusions of the U.S. Preventive Services Task Force (USPSTF). Through follow-up analysis of large populations of older adults, that study found that routine screening had limited benefits in improving hearing health among asymptomatic older adults and might cause unnecessary consumption of medical resources [1].

1.1.2 Recommendations on case finding for hearing problems Based on general practice experience, general practitioners may conduct hearing assessment for key patients with conditions that may be related to hearing impairment—for example, when there are concerns about children’s language and behavioral problems, chronic ear infection, and otitis media with effusion; or when adults ask about, worry about, or perceive that they have hearing loss [1-2]. In its 2022 general practice curriculum, the RACGP clearly stated that such targeted assessment is a key step for general practitioners in identifying hearing problems and is also the basis for subsequent intervention [2]. Specific recommendations include: (1) hearing screening for all newborns; (2) incorporating hearing assessment into fall-prevention strategies for older adults, and managing hearing-loss problems; (3) in tertiary prevention for senile dementia, including corrective measures for hearing loss, because hearing loss is one of the risk factors for senile dementia; (4) during a pregnant woman’s first comprehensive physical examination, if hearing loss is identified and sign-language communication is needed, extending the time allocated for the first antenatal visit so that all scheduled content of that visit can be better completed; (5) when providing general practice services to Indigenous Australians and Torres Strait Islanders, recognizing that this socioeconomically disadvantaged population has a relatively high prevalence of hearing loss, which is associated with its relatively high rate of persistent otitis media during infancy and early childhood; and (6) considering case finding for hearing loss in specific populations, including older adults with presbycusis; workers in noisy environments, such as construction sites, high-noise workshops, farm machinery operators, entertainment venues, and music venues; people who frequently use headphones to listen to music or play games; people with a family history of hearing loss; other socioeconomically disadvantaged groups, such as asylum seekers; and those who have not previously undergone hearing testing.

1.2 Recommendations of the “Red Book” on preventive activities

The hearing-health guidance and recommendations provided by general practitioners to patients are as follows, and are all based on clinical practice experience in general medicine.

1.2.1 Recommendations on living environment and habits (*supplemented with reference to WHO safe-listening recommendations*)

Avoid prolonged exposure to excessive sound—for example, levels exceeding 85 dB, equivalent to the noise level at a busy traffic intersection or construction site—or environments with excessively long-lasting noise, such as long-term work in bars, factories, and similar settings. In high-noise environments, such as renovation sites, concerts, and shooting ranges, hearing-protection equipment that meets standards, such as earplugs or earmuffs, must be used, and it must be ensured that the equipment is worn correctly and fits the ear canal. When using personal audio devices, such as headphones or earbud-style players, the

volume should be strictly controlled—recommended not to exceed 60% of the maximum volume—and prolonged continuous use should be avoided, with a rest of 10–15 minutes after every 1 hour of use. Particular emphasis is placed on avoiding children’s exposure to tobacco smoke, including passive smoking during pregnancy and secondhand smoke in the postnatal living environment, because harmful substances in smoke, such as nicotine and carbon monoxide, increase the risk of otitis media in children and may further lead to hearing damage [^3]. In its “make listening safe” initiative, WHO also explicitly lists the above measures as core recommendations for global hearing protection, aiming to reduce the incidence of noise-induced hearing loss worldwide [^3].

1.2.2 Vaccination recommendations

General practitioners recommend that patients prevent infection through vaccination and reduce the incidence of acute otitis media and/or acquired hearing loss: it is recommended that all people aged ≥ 6 months (including infants and young children, adults, and older adults) receive inactivated influenza vaccine on schedule every year, because influenza virus infection is one of the important triggers of acute otitis media; vaccination can reduce the occurrence of influenza-related otitis media, thereby lowering the risk of hearing impairment. Children under 15 years of age should receive rubella vaccine, measles vaccine, *Haemophilus influenzae* type b (Hib) vaccine, and meningococcal vaccine according to the corresponding immunization schedule or recommendations. These vaccines can prevent ear complications caused by infections with the corresponding pathogens (such as hearing-nerve injury caused by suppurative otitis media or meningitis), thereby reducing acquired hearing loss. In infancy (usually at 2, 4, and 6 months of age and at 12–15 months of age), standardized administration of the 13-valent pneumococcal conjugate vaccine (PCV13) can effectively prevent serious ear diseases caused by pneumococcal infection (such as acute suppurative otitis media and mastoiditis), and is of great significance for protecting children’s hearing. At the same time, vaccination is a key preventive measure for reducing the risk of hearing loss[^4].

1.2.3 Recommendations for preventive measures in pregnant women

General practitioners recommend providing rubella antibody testing for all pregnant women. If the test result is negative (indicating no rubella immunity), rubella vaccine should be administered promptly after the end of pregnancy, to avoid congenital hearing loss in the fetus caused by rubella virus infection during pregnancy. At the same time, serological testing for syphilis should be performed for all pregnant women (such as non-treponemal serological tests and treponemal-specific serological tests), so that syphilis infection during pregnancy can be detected and treated promptly, preventing *Treponema pallidum* from infecting the fetus through the placenta and causing congenital syphilis-related hearing loss[^4].

2 Interpretation of the “Red Book”

2.1 Prevalence of hearing loss and related knowledge

In Australia, approximately 3.6 million people (14% of the total population) have some degree of hearing loss, with the rate slightly higher in men than in women. Although hearing loss may affect people of all ages, its prevalence rises with age, causing physical, functional, and psychological problems. Among people with hearing loss, 1.3 million cases of hearing loss (more than one-third) are preventable. This is the rationale for incorporating hearing-specific prevention activities into general preventive activities^[5-6].

The prevalence of hearing loss in China is estimated at approximately 220 million people, accounting for about 16% of the total population. The *China Hearing Health Report (2021)* points out that the incidence of hearing loss among Chinese adolescents ranges from 1% to 19.23%, mainly due to recreational noise exposure. The prevalence among people aged 60 years and above in China is approximately 45%^[7]. According to a 2016 study, among older adults aged 60–74 years, the proportion with hearing loss reached 53.7%^[8]. From 1990 to 2021, the prevalence of age-related hearing loss in China showed an upward trend; in 2021, the prevalence was 82,162.49 per 100,000, and the prevalence in men was consistently higher than in women^[9]. Consistent with international trends, hearing loss in China is also, to a large extent, preventable. The key lies in avoiding excessive noise exposure, maintaining healthy lifestyle habits, and paying attention to hearing signals. Hearing loss can be effectively prevented by lowering volume, using earplugs, avoiding prolonged exposure to high-noise environments, maintaining a balanced diet, exercising regularly, and undergoing regular hearing checks.

Therefore, the preventive activities for hearing damage proposed in the “Red Book” are likewise of clear significance in China.

Prevention of hearing loss needs to target high-risk groups. Age factors, exposure environments, congenital or otogenic childhood hearing loss, disease complications, genetic factors and ototoxic medication factors, as well as smoking and other causes, all contribute to an increasing number of people with hearing loss. Studies in Australia have found that, among Aboriginal and Torres Strait Islander peoples, the high incidence of chronic suppurative otitis media and cholesteatoma during infancy and childhood is associated with hearing loss throughout life. Risk factors for hearing loss in China are similar to those internationally: aging, exposure to noise, genetic factors, ear infections, and low birth weight, intrauterine infection, hyperbilirubinemia, meningitis, and other neonatal conditions are considered major risk factors.

2.2 Evidence for incorporating hearing-prevention activities into guidelines

General practitioners occupy an advantageous position in detecting, diagnosing, and providing recommendations for preventing hearing loss. This position of general practitioners is related to the institutional arrangements for general practitioners in national and regional health-care service systems. In Australia (as well as the United Kingdom and other countries that strictly implement a general-practitioner first-contact system), general practitioners are at the core of the medical and health service system. They are everyone's first point of contact with the health-care system, and they resolve the common medical problems of the vast majority of people. At the same time, the gatekeeping role of general practitioners enables them, in the name of patient health, to coordinate services that patients need, including hospital emergency care, specialist outpatient care, collaborative care, rehabilitation, and social resources. Through service planning and referral mechanisms, the cost-effectiveness and equity of the medical and health system can be realized.

This institutional arrangement for general practitioners and general-practice services gives general practitioners excellent opportunities to provide preventive services. In 2024, 84% of Australians saw a general practitioner at least once within a year; the average number of annual general-practitioner visits per person was 5.2 for men and 7.0 for women^[10]. People aged 80 years and above had the highest utilization rate of general-practice services, reaching an average of 18 visits per person per year^[11]. Compared with systems allowing free choice of medical care ("free access," in which hospital and specialist services can be obtained directly without referral), the gatekeeping system enables general practitioners to come into contact with patients to the greatest possible extent, and to play a greater role in preventive services, cost control, reducing unnecessary examinations, and better coordination of services.

Maximizing contact with patients does not mean collecting patient information to the maximum extent. Even under systems such as those in the United Kingdom or Australia, universal screening of asymptomatic individuals is not recommended. This is because evidence shows that the benefits of hearing screening in asymptomatic individuals are not clearly greater than the problems it brings to patients (such as iatrogenic harm and psychological distress), as well as the waste of limited medical resources, medical-ethical issues caused by induced demand, and so forth. Therefore, Australia recommends opportunistic hearing testing for people at high risk and for those presenting with hearing-related complaints—that is, case finding.

The "Red Book," in addition to providing general practitioners with recommendations concerning screening or examinations, also provides recommendations on giving advice to patients. It should be noted that preventive activities are actions taken jointly by doctors and patients: the actions taken by doctors are mainly patient education, whereas the actions taken by patients are mainly day-

to-day self-management. It is a one-sided understanding to assign preventive activities only to doctors. The “Red Book” points out that scientific evidence remains insufficient regarding the effectiveness of hearing-prevention measures undertaken for patients; therefore, the hearing-prevention activities in the “Red Book” are mainly based on the perspective of general-practice clinical work, rather than on rigorous scientific findings. In other words, there is as yet no definite or consistent scientific conclusion demonstrating that the practice of general practitioners giving patients advice and guidance can improve patients’ hearing or correct hearing loss. From the perspective of evidence-based medicine, evidence based on general-practice perspectives is relatively weak. However, general practice also holds that general-practice services are, in essence, an “alloy” of evidence-based and practice-based approaches. This is a concept similar to the widespread use of traditional Chinese medicine in China’s primary medical services. As Einstein said, “Not everything that is meaningful can be calculated.”

2.3 Specific Content of Recommendations on Hearing Prevention

In Australia’s national preventive health system, opportunistic screening and clinical assessment for hearing health constitute one of the core preventive programs in general practice. Their implementation standards strictly follow the “Red Book” and the relevant clinical practice guidelines of the Audiology Australia (ALA), ensuring the timeliness, targeted nature, and scientific basis of preventive interventions. Among these, the most important responsibilities of general practitioners are to recognize and identify populations at risk of hearing loss, coordinate and arrange hearing assessment, refer complex cases to specialists, and provide long-term management for patients.

2.3.1 Universal Newborn Hearing Screening System

All Australian states have established standardized Universal Newborn Hearing Screening (UNHS) programs. This program is an important component of the national child health plan and requires full nationwide coverage. Therefore, every Australian state has an infant hearing screening program, which includes a test that is usually performed in hospital after the infant is born.

2.3.2 Targeted Hearing Assessment for High-Risk Populations

For patients with conditions that may be related to hearing loss, such as language or behavioral problems in children, or perceived hearing loss in adults, the “Red Book” clearly states that hearing testing is best practice for comprehensive assessment. At the same time, some cases that may have been missed in newborn screening need to be additionally identified through subsequent follow-up assessment. General practitioners need to formulate individualized opportunistic screening plans based on the patient’s age, medical history, and exposure risks.

In Australia, hearing assessment is usually carried out by a general practitioner referring the patient, or a person at risk of hearing loss, to an audiologist. After the audiologist conducts the assessment, the results are returned to the general practitioner, who then provides ongoing management of the patient. An audiologist is a professional in hearing loss and balance disorders; they provide hearing assessment services and improve patients' communication ability through hearing aids and other assistive technologies. Audiologists are usually not doctors, but rather persons who have received clinical audiology training and obtained membership qualification from Audiology Australia. The Australian Health Practitioner Regulation Agency (AHPRA) formally lists audiologists as registrable allied health professionals. For patients with complex and severe hearing impairment, if special pharmacological treatment or surgical treatment is needed, the general practitioner may refer the patient to an ear, nose, and throat specialist (ENT specialist) for more specialized assessment and treatment. In any case, the general practitioner is responsible for coordinating management and long-term follow-up for patients with hearing problems.

2.3.3 Standardized Selection of Screening Tools

How to opportunistically identify patients with potential hearing impairment is one of the main responsibilities of general practitioners. In clinical practice, general practitioners may, according to the patient's situation, use simple hearing assessment tools suitable for use in general-practice service settings. For high-risk groups such as older adults, it is recommended to use single-question screening or longer standardized questionnaires, such as the *Hearing Handicap Inventory for the Elderly—Screening Version (HHIE-S)* [12]. This questionnaire contains 10 core questions and uses a 0–2–4 graded scoring method; a score >8 indicates possible clinically significant hearing impairment [13]. For patients with abnormal initial screening results or clear symptoms, referral to an audiologist should be made for objective tests such as pure-tone audiometry and acoustic immittance testing, so as to determine the type and degree of hearing loss. The “Red Book” clearly states that traditional subjective methods such as the whisper test and finger-rub test are not recommended. This is because such methods lack standardized operating procedures; their results are easily affected by the testing environment, the examiner's vocal intensity, and the patient's subjective response. Their accuracy and repeatability are poor, and misdiagnosis or missed diagnosis may occur.

2.3.4 Expected Results of Recommendations for Hearing-Prevention Activities

Through prenatal education by general practitioners, postpartum guidance, and standardized implementation of hospital screening procedures, Australian states and territories have established newborn hearing screening programs—UNHS. The Red Book reminds general practitioners to confirm that parents are aware of the relevant programs and to confirm that newborns have completed the corre-

sponding screening. Studies show that, among children with hearing impairment who receive early intervention, language-development levels can approach those of normally hearing peers, and rates of academic success after school entry are significantly improved. In addition, deepening family awareness will also encourage parents to actively participate in children's subsequent hearing follow-up, reducing the risk of missed diagnosis caused by delayed-onset hearing loss, such as enlarged vestibular aqueduct syndrome [14].

For patients with conditions related to hearing loss, standardized assessment enables timely intervention, avoids or delays irreversible damage to hearing function, and prevents associated clinical manifestations, such as delayed language development in children [15], behavioral abnormalities, recurrent otitis media, tinnitus, vertigo, and ear pain in adults, as well as communication disorders and cognitive decline in older adults [16-18].

For populations at high risk of hearing loss, individualized advice and behavioral interventions can reduce the incidence of hearing loss, slow the progression of hearing loss, and greatly reduce the risk of related complications [19].

3 Discussion

3.1 Why General-Practice Prevention of Hearing Loss Is Important

The overall prevalence of hearing loss among older adults in China is 69%; among these, the prevalence rates of moderate and severe age-related hearing loss are 41% and 10.1%, respectively [20]. Studies have found that 24% of older patients with hearing loss experience psychological and psychiatric problems such as anxiety and depression to varying degrees, as well as social isolation [21], and at the same [[unclear: text continues beyond the visible page]]

approximately 40% are accompanied by tinnitus and 20% by balance disorders^[21-22]; cognitive decline also occurs more often among patients with hearing impairment. Compared with normal older adults, the incidence of Alzheimer's disease among older adults with mild, moderate, and severe hearing loss is 2-fold, 3-fold, and 5-fold higher, respectively^[23]. In addition, hearing loss is associated with an increased probability of falls among older adults^[24], seriously affecting their quality of life. Moreover, among adolescents aged 12-17 years, the prevalence of noise-induced hearing impairment caused by long-term use of earphones has reached 12.5%^[25]; hearing decline may lead to problems such as reduced learning ability and social isolation. While recognizing the severity of the problem, we also clearly recognize that preventive activities such as early detection and timely treatment can markedly improve patients' hearing health status.

Hearing impairment has a reversible window for intervention, and general practitioners are in an advantageous position for testing, diagnosis, and providing recommendations to prevent hearing loss. Therefore, drawing on the relevant recommendations of the RACGP guidelines, carrying out early detection, early

diagnosis, and early intervention for hearing problems in China is of important practical significance for improving the hearing health status of Chinese residents, reducing the disease burden related to hearing, and improving residents' quality of life; it has become a pressing priority in China's public health field and in general practice.

3.2 Whether China Has Similar General-Practice Prevention Recommendations

At present, China already has relevant policies and recommendations in the field of hearing health management. For example, regarding hearing impairment in older adults, domestic scholars have summarized and developed best evidence for primary health-care institutions on the management of hearing loss in older adults, covering screening, assessment, intervention, and follow-up for hearing loss in older adults^[26]. In addition, China's *Technical Specifications for Newborn Hearing Screening*^[27] also clearly stipulate the process and technical standards for newborn hearing screening.

Overall, however, China has not yet issued a guideline like the RACGP guideline that is specifically aimed at general practitioners, covers the entire population—including newborns, children, adolescents, adults, older adults, and special populations—and is systematic and comprehensive in content, covering the whole process of hearing-problem prevention activities such as screening, diagnosis, prevention, intervention, and referral. General practitioners therefore lack a unified and specific guidance document when providing hearing health services.

3.3 Similarities and Differences Between China and Australia

3.3.1 Similarities

Existing Chinese recommendations for the management of hearing loss in older adults are consistent with the RACGP guidelines in their core objectives. Both emphasize the central role of general practitioners in hearing health management, and both provide general practitioners with relevant recommendations on early warning of hearing impairment—such as identifying hearing-related symptoms—screening—such as using standardized questionnaires—assessment—such as hearing function testing—treatment—such as guiding the use of hearing aids—and referral—such as referring patients with severe hearing impairment to specialist institutions. Their aim is to achieve early management of hearing problems through general-practitioner intervention and to improve patient prognosis^[17, 22].

3.3.2 Differences

- (1) **The population coverage differs:** China's current hearing-management recommendations for general practice are limited to

older adults, mainly focusing on screening and management of hearing loss in older adults; by contrast, the RACGP guideline recommendations cover the whole population, including newborns, children, adolescents, adults—including both asymptomatic and symptomatic groups—older adults, and special populations such as Indigenous peoples, and propose differentiated management strategies for hearing-health risks and problems in different groups^[21, 23, 26].

- (2) **The comprehensiveness of preventive measures differs:** The RACGP guidelines propose comprehensive hearing-prevention measures across multiple dimensions, including environmental protection, vaccination, and antenatal prevention. For example, they explicitly recommend that specific populations receive influenza vaccination, pneumococcal vaccination, and other vaccines to reduce the risk of otitis media-related hearing loss, and they emphasize the importance of rubella antibody testing and syphilis serology during pregnancy for preventing congenital hearing loss^[3-4]. By contrast, China's existing management recommendations focus more on screening for and intervening in hearing loss, and their content on preventive measures such as vaccination and antenatal prevention is relatively limited^[28].
- (3) **The degree of refinement in screening recommendations differs:** The RACGP guidelines provide more refined screening recommendations. For example, they explicitly do not recommend routine hearing screening for asymptomatic adults aged ≥ 50 years, while also specifying in detail the particular symptoms and populations that require hearing assessment^[20-21]. Although China's existing management recommendations mention hearing screening for older adults, their provisions are relatively general with respect to stratifying the screened population—such as whether to distinguish asymptomatic from symptomatic older adults—screening frequency, and the choice of screening methods—such as whether to recommend a specific standardized questionnaire^[26]. China's general-practice management recommendations are limited to older adults and are not recommendations for the whole population.

3.4 Points to Note When Developing or Improving Recommendations

- (1) The current primary health-care system has problems in hearing-loss management, including insufficient awareness of screening, lack of equipment, shortage of professionals, and imperfect referral mechanisms^[28]; these need improvement. (2) As emphasized in the RACGP guidelines, hearing screening should follow the principle of whole-population coverage and abandon a “one-size-fits-all” model of routine screening for all, so as to avoid wasting medical resources. It is recommended that hierarchical and classified management be established for the general population, occupational groups exposed to noise, high-risk older-adult groups, special new-

born populations, and others, with differentiated screening frequencies and trigger criteria formulated. The applicable scope of routine screening for asymptomatic middle-aged and older adults should be strictly defined to reduce meaningless overtesting, while also ensuring that high-risk and special populations—such as children, the oldest-old, users of ototoxic drugs, and those with a family history of hearing loss—are not missed in screening. (3) Strengthen training for general practitioners in disease assessment and diagnosis, so that diseases can be identified promptly and referral can be made as soon as necessary.

3.5 High-Quality Evidence Directions That China Urgently Needs to Strengthen

- (1) Clinical guidelines for the prevention, diagnosis, and standardized management of various types of otitis media; (2) evidence for the localized application and validation of hearing screening scales for older adults suitable for the Chinese population, such as the HHIE-S^[12]; (3) systematic hearing-health popular-science materials and grassroots health-education materials; (4) standards for identifying ototoxic drugs, monitoring their use, and managing their safety; (5) research on early identification indicators, standardized processes, and referral indications for hearing impairment.

4 Summary

Hearing loss in China is characterized by high prevalence, high harm, and high preventability. It is especially prominent among older adults and adolescents, and has become an important health issue that cannot be ignored in grassroots public health and general practice. The “Red Book” 提

The hearing health management strategy put forward emphasizes avoiding indiscriminate universal screening, focusing instead on high-risk and symptomatic populations, as well as life-course prevention for the entire population. Its content takes into account both evidence-based support and general-practice realities, and is highly scientific and operable.

Compared with Australia, China still has obvious deficiencies in existing hearing health management in terms of whole-population coverage, the systematic nature of preventive measures, refinement of screening, and integration with vaccination and maternal health care. There is also a lack of unified, standardized hearing-prevention guidance for general practitioners. Therefore, drawing on the experience of the “Red Book,” China should accelerate the construction of a primary-level hearing-prevention system suited to national conditions, clearly define the responsibilities of general practitioners in hearing screening, health education, risk-factor intervention, and specialist referral, and strengthen comprehensive preventive measures such as noise protection, vaccination, and

maternal health care, so as to improve the ability of general practitioners to assess hearing and identify problems early. In the future, it will be necessary to further strengthen localized research, improve screening tools, referral pathways, and high-quality clinical evidence suited to the Chinese population, promote the true integration of hearing health into basic public health services in general practice, improve China's primary-level hearing-health prevention system, and carry out targeted interventions for high-risk populations. This is of important practical significance for reducing the disease burden of hearing impairment and improving residents' quality of life.

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