



# Otitis Media Model of Care

**WA Department of Health**

Otitis Media Model of Care Working Group  
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Dr Revle Bangor-Jones	Public Health Physician, Public Health and Clinical Services, WA Department of Health Co-chair, Otitis Media Model of Care Working Group
Dr Stephen Rodrigues	ENT Surgeon, Chair, Ear Nose & Throat Advisory Group, Neurosciences and the Senses Health Network Co-chair, Otitis Media Model of Care Working Group
Prof Harvey Coates	ENT Surgeon
Mr Martin Cleary	WA Department of Education
Ms June Doyle	Senior Coordinator, Aboriginal Health, South Metropolitan Health Service
Ms Laura Elkin	Consumer Partners Program Co-ordinator, Health Consumers' Council of WA
Dr Michael Watson	Microbiologist and Infectious Diseases Physician
Dr Carol Reeve	Public Health Physician, Kimberley Population Health Unit, Northern and Remote Country Health Service
Dr Alan Leeb	General Practitioner and representative of the Royal Australian College of General Practitioners
Ms Carol Dowling	Consumer and broadcaster, Noongar Radio
Ms Hayley Matthews	Aboriginal Health Council of WA (AHCWA)
Mr Brendan Robb	A/Director, Workforce, WA Department of Health
Ms Jenni Collard	Director, Aboriginal Health, WA Department of Health
Ms Dianne Bianchini	Office of Chief Health Professions, WA Department of Health
Ms Kate Gatti	Area Director, Population Health, WA Country Health Service
Ms Diann Peate	Manager, Aboriginal Health Team, Child and Adolescent Community Health, WA Department of Health
Ms Fiona Maguire	Office of Aboriginal and Torres Strait Islander Health, Department of Health and Ageing
Ms Alison Pash	Acting Policy Officer, Child and Adolescent Community Health, WA Department of Health
Ms Suzanne Taylor	Senior Development Officer, Health Networks Branch, WA Department of Health

## Forward

By Director General WA Health

I am pleased to present the WA Health Otitis Media Model of Care. This document clearly identifies otitis media as a significant public health issue and outlines strategies to address this problem.

The problems arising from otitis media are clearly identified. The complex nature of causal factors and effective management strategies require a coordinated approach which tackles the challenging issues of workforce, geographical isolation, cultural relevance, inter-departmental relationships and the social determinants of health.

This model of care has been developed with engagement across health, education, government and non-government sectors. It contains ten key recommendations which, when implemented, have the potential to ensure that all Western Australian children have the opportunity to benefit from prevention, primary health care and specialist management of otitis media.

I commend the Otitis Media Model of Care Working Group for the timely development of this document and look forward to the ongoing guidance this Group can provide to ensure implementation of these recommendations.

The use of the term “Aboriginal” within this document refers to both Aboriginal and Torres Strait Islander Australians.

## Executive summary

Otitis media (OM) is a common childhood illness, from which most children will recover quickly with appropriate treatment. Some population groups, however, have much higher rates of OM and also have unacceptably high rates of chronic suppurative OM (CSOM) with associated impact on hearing, language development and learning ability. Australian Aboriginal children have the highest prevalence (up to 70% in remote communities) of CSOM in the world.

In response to this health issue, a number of government and non-government agencies are implementing specific health programs. WA Health has recognised that coordination of health care across the age and intervention spectrums is essential if OM prevalence and impact are to be reduced. This model of care identifies the priority target populations of:

- All Aboriginal children and in particular children aged 0-4 years;
- Children in child care centres;
- Refugees and migrants from high risk countries.

A coordinated approach to OM will ensure that the **right care** for the **right patient** occurs at the **right time** by the **right team** in the **right place**. To achieve this, a three pronged approach must address:

**1. Prevention** through:

- addressing the social determinants of health;
- culturally relevant and community-driven health promotion and education;
- coordination with other public health prevention programs addressing diseases with similar epidemiology and aetiology.

**2. Primary health care**, consistent with Commonwealth guidelines<sup>6</sup> and the WA Primary Health Care Strategy<sup>7</sup>, including:

- early diagnosis and effective treatment of Acute Otitis Media (AOM);
- monitoring of children with recurrent Acute Otitis Media (rAOM) and/or Otitis Media with Effusion (OME), including specialist audiologist and Ear Nose and Throat (ENT) review as appropriate either by telehealth or face to face;
- coordinated management of CSOM in the primary care setting;
- testing for and provision of hearing aids and sound amplification for individuals and in classrooms to ensure children affected by OM are able to hear at school;
- developmental rehabilitation in communities, schools and health care settings for children whose development has been affected by OM-related hearing loss.

**3. Specialist care**, including:

- ENT review;
- Audiology and speech pathology;
- ENT surgery in safe environments as close to home as possible.

## Key recommendations

1. Emphasis should be placed on **primary prevention** which addresses the **social determinants of health** and includes health promotion strategies which have been shown to be effective in the priority target populations.
2. The following **priority populations** should be targeted for prevention and treatment of OM:
  - Aboriginal children aged 0-4 years;
  - Children in child care centres;
  - Refugees and migrants from high risk countries.
3. All strategies to address otitis media in Aboriginal communities must be **non-judgemental, community guided, culturally relevant and respect a holistic view of health**.
4. **Coordination** across the patient journey must increase, including:
  - **care coordination at the client level** - to ensure that individual children and their families are able to access timely treatment and are not lost in the system. This coordination may be incorporated with other health liaison roles;
  - **operational service coordination** across government, Aboriginal community controlled and non-government sectors to reduce service duplications and gaps. This should include coordination of visiting schedules, resources, patient record systems and other high priority health programs (for example, dental services).
  - **strategic coordination** between:
    - WA Health;
    - Commonwealth Department of Health and Ageing, including the Office of Aboriginal and Torres Strait Islander Health;
    - WA Department of Education;
    - WA Department of Indigenous Affairs;
    - Aboriginal Community Controlled Health Organisations;
    - WA Regional Development Council;
    - WA Local Government Association;
    - Medicare Locals;
    - Research and education sector;
    - Department for Child Protection;
    - Department for Communities;
    - Disability Services Commission.

This may include the establishment of an Otitis Media Strategic Reference Group which oversees strategic investment in and outcomes from otitis media prevention and treatment programs.
5. An **OM management plan for children in rural and remote areas** should be developed. This plan should be fully costed, focus on primary health services and be based on a multi-sectoral approach including links with Medicare Locals, the Aboriginal community controlled sector and non-government agencies.

6. **Research** into effective otitis media prevention, screening and treatment strategies and **evaluation** of programs should be supported and used to guide future investment. This should include collection of accurate prevalence data through **surveillance** activities.
7. In conjunction with Medicare Locals, the tertiary education sector and specialist colleges WA Health should develop a **workforce plan** to build an otitis media primary care workforce and ensure adequate supply of specialists. This plan should include investment in training primary care Nurse Practitioners (NPs) who can diagnose and prescribe treatment for otitis media, strategies to ensure access to General Practitioners (GPs) and training of GPs, ENT specialists and audiologists.
8. The Chief Health Professions Office and the Clinical Training Network should review the training, clinical placement and employment opportunities for **audiology** and **speech pathology** students and graduates.
9. The role of **telehealth** in primary care and specialist management should expand through consolidation of investment in resources across sectors, and inclusion of telehealth in design of services.
10. WA Health should collaborate with the Department of Education, Aboriginal community controlled sector, Commonwealth departments and non-government agencies to develop a resource plan for **hearing aids**, **sound amplification** and **child development therapy** to address temporary and permanent hearing loss in populations with high prevalence of OM.



## Acronyms

ACCHO	Aboriginal Community Controlled Health Organisation
AHW	Aboriginal Health Worker
AIHW	Australian Institute of Health and Welfare
AMS	Aboriginal Medical Service
AOM	Acute Otitis Media
AOMwiP	Acute Otitis Media with Perforation
AOMwoP	Acute Otitis Media without Perforation
APHRA	Australian Health Practitioner Regulation Agency
CACH	Community and Adolescent Community Health
CHN	Community Health Nurse
CSOM	Chronic Suppurative Otitis Media
DALYs	Disability Adjusted Life Years
DoHA	Department of Health and Ageing (Commonwealth)
DIA	Department of Indigenous Affairs
EACH	Enhanced Aboriginal Child Health
ENT	Ear, Nose and Throat
GP	General Practitioner
LGA	Local Government Authority
NP	Nurse Practitioner
OATSIH	Office of Aboriginal and Torres Strait Islander Health
OM	Otitis Media
OME	Otitis Media with Effusion
PMH	Princess Margaret Hospital
rAOM	recurrent Acute Otitis Media
SES	Socio Economic Status
WACHS	WA Country Health Service
WHO	World Health Organization

# 1. Introduction

## 1.1 What is otitis media?

Otitis media (OM) is inflammation of the middle ear and is a common childhood illness. For most children, OM is an acute condition from which they recover spontaneously or following antibiotic treatment. Bacteria associated with acute otitis media (AOM) are also associated with upper respiratory tract infection – *Streptococcus pneumoniae* and *Haemophilus influenzae* – and the two conditions frequently occur concurrently.

There are a number of risk factors for OM, summarised in Table 1:

**Table 1: Risk factors for otitis media**

*Table adapted from*<sup>8</sup>

<b>Risk factor</b>	<b>Comment</b>
Age	Highest incidence between 6 and 11 months
Sex	Slightly higher preponderance among males
Ethnicity	Aboriginal children are at increased risk of earlier and more severe disease and there is a higher prevalence of OM in some refugee and migrant groups
Premature birth	Increased risk
Allergy	Link noted, but pathways unclear
Immunosuppression	Subtle immune deficiencies often noted in recurrent acute otitis media
Genetic predisposition	Familial clustering noted
Craniofacial abnormalities	Increased incidence in children with cleft palate, Down syndrome and craniofacial anomalies
Adenoids	Infected adenoids or tissue increases risk more than size of adenoids
Gastro-oesophageal reflux	Link noted, but further study required
Intense contact with multiple children	Higher incidence with day-care attendance and in overcrowded homes
Siblings	Increased risk with older siblings
Upper respiratory tract infection	Pathogens predispose to otitis media
Seasonality	Increased incidence in winter months
Cigarette smoke exposure	Increased risk
Socioeconomic status	Variable but generally increased risk with lower status
Dummy (pacifier) use	Increased risk in children over age 11 months

## 1.2 Complications and progression of otitis media

Acute OM (AOM) may become recurrent and/or lead to perforation of the ear drum. Recurrent AOM (rAOM) may lead to otitis media with effusion (OME) which is sometimes called 'glue ear'. This condition is characterised by the presence of fluid behind the ear drum, may be episodic or persistent and results in reversible hearing impairment. When an ear drum has perforated, this fluid will drain into the external ear. If the perforation does not heal, the infecting pathogens may change to opportunistic pathogens more common in the external ear, such as *Pseudomonas aeruginosa* and *Staphylococcus aureus*<sup>9</sup> causing Chronic Suppurative Otitis Media (CSOM). The discharge associated with CSOM can persist for years and lead to destruction of the bone in and around the ear, and permanent hearing loss. Other OM complications such as cholesteatoma, mastoiditis, meningitis and brain abscesses are rare but can require urgent specialist treatment.

## 1.3 Burden of disease

### Prevalence

As OM is not a notifiable communicable disease, prevalence can currently only be estimated by analysis of health care use and projection from studies of defined populations. It has been estimated that up to 73% of Australian children will be affected by AOM by the time they reach 12 months of age<sup>10</sup>. This high prevalence has implications relating to access and cost of primary health services, and lost productivity of parents and carers.

It is estimated that in 2008 almost 600,000 Australians were affected by mild to moderate temporary hearing impairment from AOM or OME, more than 150,000 had perforation of an ear drum and 100,000 had CSOM. In addition, an estimated 420 Australians were likely to suffer mastoiditis and 385 have intracranial complications as a result of AOM<sup>10</sup>.

The World Health Organization considers Australian Aboriginal people as one of the population groups requiring urgent action to address CSOM as a significant public health problem<sup>9</sup>. While there is no comprehensive surveillance of CSOM in Aboriginal communities, the prevalence has been estimated to be between 5 and 70%<sup>9,11,5</sup>. Child health checks in the Northern Territory have found that CSOM persists into the late primary school years<sup>12</sup> and anecdotal reports suggest this is also the case in Western Australian Aboriginal communities. There are anecdotal reports that a significant number of Aboriginal adults have long term dry perforations of one or both ear drums, most likely as a consequence of childhood CSOM. While rates of CSOM in remote Aboriginal communities are unacceptably high, rates are also well above acceptable levels in rural and urban Aboriginal communities.

A recent study of refugees found an overall prevalence of CSOM of 2.07% with a prevalence of 2.64% in adults<sup>13</sup>. These rates meet the World Health Organization definition of high prevalence and also suggest that untreated CSOM can persist into adulthood.

Another sub-population which has high rates of OM is children who attend day care with up to 20% of children in full time day care having grommets in situ<sup>14</sup>. With overcrowding in homes being a significant risk factor of OM<sup>15,5</sup>, prevalence of OM is likely to be higher in families and communities where multiple children share beds.

OM also has a higher incidence in children with Down Syndrome and unrepaired cleft palate and cranio-facial disorders <sup>16</sup>.

## **Deaths**

Otitis media rarely leads to fatal complications but, between 1997 and 2003, there were around four deaths per year in Australia with OM as an underlying cause <sup>10</sup>. The WHO noted that 50,000 people die annually worldwide due to complications of OM, or one death every ten minutes.

## **Disability adjusted life years, well-being and productivity losses.**

The burden of disease in Australia for OM is estimated to be 5, 717 disability adjusted life years (DALYs) for the first five years of life, and the cost of well-being was estimated to be between \$1.05 and \$3.49 billion <sup>10</sup>. This same study estimated that productivity and other non-health financial costs in Australia for people with OM to be \$67 million in 2008 and the cost of lost productivity of carers of children with OM was \$189 million.

These estimates account for lost productivity due to acute illness and hearing loss but for some communities with very high prevalence of OM, the burden associated with absence from school and associated poor educational outcomes is much higher.

## **Economic cost**

The direct health cost of treating OM includes general practitioner services, nurse and Aboriginal Health Worker care, antibiotic treatment, ENT review and surgery and hearing testing by audiologists and audiometrists. This cost in Australia is estimated to be between \$85 million and \$163 million with approximately 10% of these costs applying to Aboriginal Australians <sup>10</sup>. With 13% of Aboriginal Australians living in Western Australia <sup>17</sup>, this suggests a cost of OM management for the Western Australian Aboriginal population of \$1.1 million – \$2.1 million, although this is likely to be an underestimate as actual health service provision in remote areas is higher than average service provision cost.

## **Hearing impairment**

Acute otitis media may result in temporary hearing impairment but chronic OME and CSOM can lead to long term hearing impairment and permanent hearing loss. For children with OME or CSOM, this loss of hearing impacts negatively on development of speech, language and communication skills <sup>9</sup>. This in turn can lead to difficulties in learning at school, behaviour problems and decreased employment options. A recent Northern Territory study of Aboriginal children aged 5 years and under found that 40% had hearing loss <sup>12</sup>. Studies of children in populations with similar CSOM rates to Australian Aboriginal populations have found rates of hearing impairment due to CSOM to be between 3.3% and 80% <sup>9</sup>. There is anecdotal evidence that this wide variation in prevalence may be related in part to seasonal issues with higher prevalence during the winter months associated with upper respiratory tract infections <sup>8</sup> and monsoonal seasons in the north of the state.

More than three episodes of OM can be linked to deficiencies in language development and delays in educational achievement <sup>18</sup>. The gap in educational achievement between Aboriginal and non-Aboriginal children can at least partially be linked to hearing loss associated with OM. The average

Aboriginal child suffers 32 months of OM and hearing loss in childhood as opposed to 3 months for the non-Aboriginal child <sup>8</sup>.

<b>Recommendation</b>
Prevention and primary care treatment of OM should be targeted to the following high risk populations: <ul style="list-style-type: none"><li>▪ Aboriginal children aged 0-4 years;</li><li>▪ Children in child care centres;</li><li>▪ Refugees and migrants from high risk countries*.</li></ul>



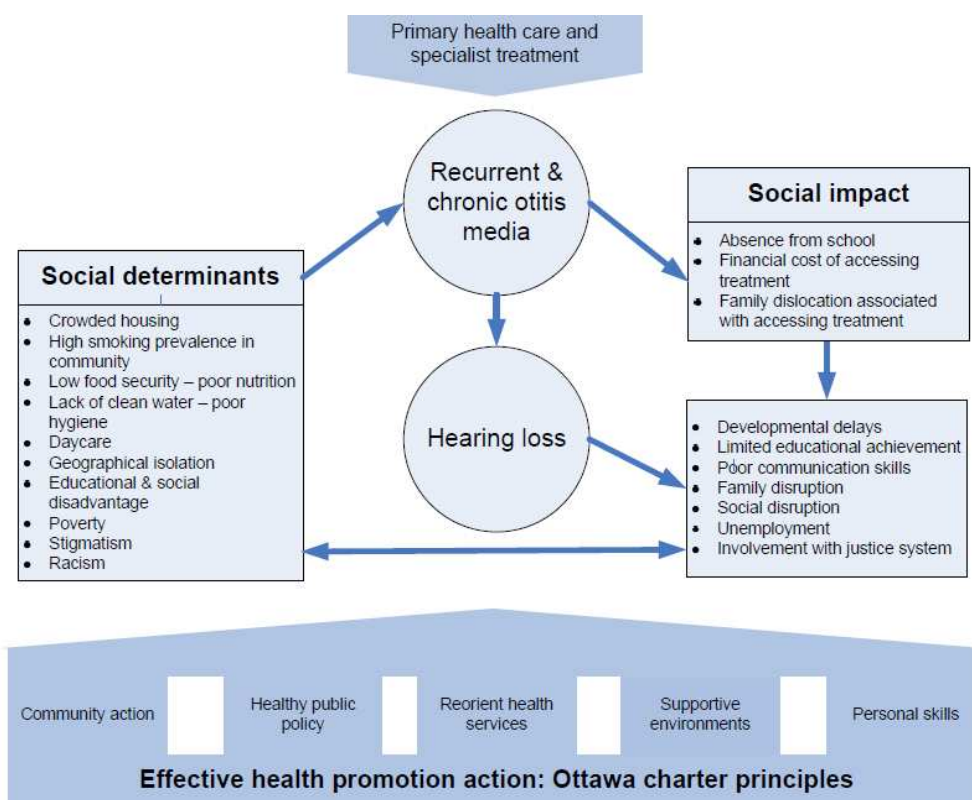
*\* Tanzania, India, Solomon Islands, Guam, Greenland, Nigeria, Angola, Mozambique, Republic of Korea, Thailand, Philippines, Malaysia, Vietnam, Micronesia and China have been identified with countries with high (>2%) prevalence of CSOM <sup>9</sup>. Local data also suggests that refugees and migrants from a number of other African, Middle Eastern and Asian countries may have high rates of CSOM related to poor social determinants of health.*

## 2. Prevention of otitis media

Successful prevention of OM must address causes and contributing factors<sup>19</sup>. At least 35 causal contributors to OM have been identified, many linked to the pre-requisites for health identified in the Ottawa charter – peace, shelter, education, food, income, a stable eco-system, sustainable resources, social justice and equity<sup>20</sup>.

The cycle of OM within Aboriginal communities and the link to the Social Determinants of Health and components of the Ottawa Charter for health promotion<sup>20</sup> are demonstrated in the diagram below:

**Figure 1: Social issues and otitis media**



It is not within the scope of this Model of Care to make recommendations in relation to programs directly addressing the Social Determinants of Health but the conditions in which people are born, grow, live, work and age will have a direct impact on their health. It is therefore essential that, consistent with recommendations from the World Health Organization,<sup>21, 22</sup> a ‘social-determinants approach to prevention’ will ensure that these determinants are considered in program planning and delivery.

A number of key factors for effective health promotion for Aboriginal communities have been identified<sup>23</sup> particularly that health promotion strategies need to be based on a community-strengths model and that:

1. Mothers and female carers should be targeted as the primary audience;

2. Within this group, mothers of younger children (aged 0-5) should be seen as a critical target group, as early treatment can greatly minimise long-term impacts;
3. Children (aged 5+) should be seen as an important secondary audience for health promotion strategies, e.g. through school-based preventive initiatives;
4. Intermediaries are a critical channel for ear health promotion as they play a crucial role in delivering information to children and carers and encouraging behaviour change;
5. Any national ear health campaign materials (e.g. DVDs) and initiatives (e.g. media campaigns) must be localised if they are to be effective.

Breastfeeding has been shown to have a protective effect.

A large number of ear health promotion resources are currently available within Australia. These are featured on the [Ear Health InfoNet](#) website and listed in Appendix 1. A local Western Australian produced series of interviews with Aboriginal people have also been presented on Noongar Radio in 2011 and 2012. These interviews have highlighted the challenges that Aboriginal families face in understanding prevention and treatment of ear disease. The producer of this series Carol Dowling has emphasised the need for prevention strategies to focus on smoking cessation, nutrition and hygiene within a family-centred model.

A review of these current programs suggests that a well coordinated, comprehensive approach is most likely to result in positive outcomes. The [Deadly Ears program](#) in Queensland is an example of a well coordinated program which meets the above criteria and preliminary evaluation has shown promising results <sup>24</sup>.

<b>Recommendations</b>
Emphasis should be placed on <b>primary prevention</b> which addresses the <b>social determinants of health</b> and includes health promotion strategies which have been shown to be effective in the priority target populations.
All strategies to address otitis media in Aboriginal communities must be <b>non-judgemental, community guided and culturally relevant and respect a holistic view of health.</b>

### 3. Surveillance, screening and early diagnosis

#### Surveillance

Surveillance which is ‘*continuous analysis, interpretation, and feedback of systematically collected data ... observing trends in time, place and persons.*’<sup>25</sup> A state-wide surveillance system would provide an opportunity to measure OM prevalence and the impact of prevention and treatment programs. Options for such a system include:

- stand-alone clinical surveys - expensive and raise ethical dilemmas if not associated with provision of treatment;
- including OM as a notifiable disease and collecting data via existing public health disease notification processes - would require legislative changes;
- using existing data available from primary health services (for example, HCare, Communicare and GP patient management systems) - would require changes to data collection, management and analysis systems to ensure data from different systems can be meaningfully collated.

#### Screening

Screening is “*a process of identifying apparently healthy people who may be at increased risk of a disease or condition. They can then be offered information, further tests and appropriate treatment to reduce their risk and/or any complications arising from the disease or condition*”<sup>26</sup>. While ‘*Principles and practice of screening for disease*’<sup>27</sup> is more than 40 years old, the information provided in this WHO document still provides appropriate guidance in relation to screening programs which is summarised below:

- **The disease or condition**  
The condition sought should be an important health problem for the individual and community and there should be an early stage in the condition during which people are asymptomatic. The natural history of the disease should be well known and there should be demonstrated value in early intervention or treatment.
- **The population to be screened**  
The target population should be clearly identified, accessible and accept the screening as useful and relevant, thus being willing to participate. The proportion of the target population which needs to be screened in order to impact on health outcomes should be known and this has not occurred in relation to OM or hearing loss. A 2009 review found ‘*no evidence that screening plus early surgery for OM and/or conductive hearing loss improves health, developmental or educational outcomes for children at risk of otitis media with effusion in the first four years of life*’<sup>28</sup>.
- **The screening method**  
Screening tools used should have high sensitivity (yielding low numbers of false negatives) and high specificity (yielding low false positives). Screening should identify sufficient numbers of positive results to demonstrate a public health benefit but not so many that the majority of people screened are positive. If this occurs, a direct treatment program is warranted. The cost of a screening program should be proportionate to its



value within the total spectrum of the specific condition from primary prevention through to palliation. No cost analysis of multiple Western Australian ear health screening programs has been undertaken and there are not currently any definitive best practice guidelines for ear health screening tools.

▪ **What happens after screening?**

Screening should facilitate access to appropriate treatment services not replace investment in them.

The ear health and/or hearing screening programs currently operating in Western Australia are summarised in Appendix 2. While the term screening is used to describe these programs, most are in fact case-finding or early diagnosis strategies and do not meet the WHO criteria for effective screening.

Recommendation
<b>Research</b> into effective otitis media prevention, screening and treatment strategies and <b>evaluation</b> of programs should be supported and used to guide future investment. This should include collection of accurate prevalence data through <b>surveillance</b> activities.

### Early diagnosis

Most children will demonstrate symptoms of acute illness (fever, irritability) with AOM but AOM frequently occurs concurrently with upper respiratory tract infection which may result in a similar clinical presentation. Children with OME may not demonstrate any clinical symptoms, although they may have developmental delays and behavioural changes related to hearing loss. Children and adults with CSOM will have persistent ear discharge and may also have symptoms associated with long term hearing loss. Accurate diagnosis of any form of OM relies on:

- Collection of clinical history including previous ear infections, recent or current acute illness;
- Assessment of high risk status – Aboriginal, refugee, siblings with history of OM, Down syndrome, unrepaired cleft palate, attending full time child care;
- Physical examination of the outer ear, ear canal and ear drum using an otoscope;
- Assessment of compliance and mobility of the ear drum using pneumatic otoscopy and/or tympanometry;
- Hearing assessment appropriate to age of patient;
- Review of speech development, learning ability and general behaviour.

Comprehensive guidelines for diagnosis of OM are included in the [Recommendations for Clinical Care Guidelines for the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations](#)<sup>6</sup> and a summary of practical treatment plans are included in Appendix 3. Although these guidelines refer specifically to Aboriginal and Torres Strait Islander populations, the clinical evidence for medical management of otitis media is generally applicable to other populations. A WA Health Operational Directive included in Appendix 4 describes the responsibility of WA Health personnel in relation to using these clinical guidelines.

Otoscopy and tympanometry are simple clinical skills but interpretation of results does require specialist skills developed through regular practice. GPs, community nurses and Aboriginal Health Workers are in ideal positions to perform otoscopy and tympanometry as part of routine and opportunistic clinical assessment but they need to be trained and supported in this skill. ENT specialists and audiologists are highly skilled in otoscopy and tympanometry and should be involved in supporting clinical decision-making face to face or via telehealth (using video otoscopy).

Community Health Nurses (CHNs) and Aboriginal Health Workers (AHWs) are ideally placed to assess speech development and identify behavioural issues which may indicate impaired hearing. This type of assessment is already included in the universal and targeted child and school-entry health checks conducted by CACH and WACHS. Teachers are also ideally placed to identify school-aged children who may be experiencing hearing loss.

The presence of hearing loss can be assessed by reviewing speech development, learning and behaviour but accurate audiological hearing assessment is vital to inform clinical management for children with recurrent, persistent and chronic OM. These children should receive audiological and clinical review at least six monthly<sup>6</sup>. Current shortages of audiologists in Western Australia, and particularly in rural and remote areas, means that audiological assessment is not always available when and where required.

#### ***Care close to culture***

Consistent with the WA Health Aboriginal Cultural Learning Framework<sup>1</sup> OM services '*must take into account the importance of country, family and community to Aboriginal people, the diversity of cultural practices across different communities, and the history of difficult relationships between Aboriginal people and governments that has discouraged many individuals from accessing health services.*' This includes recognising that English is a second language for many Aboriginal families in remote communities.

With a significant number of families migrating to Western Australia with Culturally and Linguistically Diverse (CaLD) backgrounds, there is also a need to consider other languages and cultures when developing and implementing prevention and treatment strategies.

## 4. Management of otitis media

### 4.1 Primary health care

Early and effective treatment of AOM provides an opportunity to prevent progression to OME and/or CSOM. While many children will present as acutely unwell when experiencing AOM and be taken by parents or carers to a health professional, symptoms may be related to concurrent upper respiratory tract infections. Children with recurrent OM of any type may not exhibit any acute symptoms and so may not be taken for assessment by a health professional. It is therefore important that primary health care providers include ear examination as a routine part of clinical assessment of children especially those from high risk populations.

Best practice for effective treatment of OM is articulated in the [Recommendations for Clinical Care Guidelines for the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations](#)<sup>6</sup> As with diagnosis of OM, the clinical evidence for medical management of otitis media is generally applicable to other populations.

In the general population, AOM may resolve in up to 80% of children with analgesics alone – antibiotics increase this rate to 94%<sup>3</sup>. In populations of otitis-prone children, such as those from Aboriginal communities, antibiotics are recommended at the initial onset of OM (in view of the risk of suppurative complications), and they should be continued for longer than 5 days. Prolonged courses of antibiotics can reduce the number of new episodes of OM in children with recurrent ear infections by 42%.

Appropriate prescription of antibiotic treatment is necessary but adherence to this treatment regime is essential. Adherence to long term antibiotic treatment can be difficult as parents/carers may not understand the importance of medication if a child is not acutely unwell, and conflicting health priorities within the family may divert attention from ongoing antibiotic administration. In communities where poverty is an underlying contributor to higher prevalence of OM, it also contributes negatively on the ability of families to comply with even short term antibiotic treatment plans. A trial of antibiotic treatment in the Northern Territory showed that many mothers could not comply with effective treatment because they lacked refrigerators. If they used a neighbour's refrigerator there was a tendency to forget the medicine. Medicine left at room temperature attracted sugar-ants and increased access by siblings<sup>29, 3</sup>.

“There is currently a breakdown in every step of the pathway from prevention and diagnosis through treatment, surgical intervention, rehabilitation and management of hearing loss. Addressing this issue and streamlining this pathway will be critical to the success of this Model of Care” - quote from service provider.

GPs are well placed to coordinate clinical management of OM. In remote areas, there is also scope for Remote Area Nurses (RANs) and/or Nurse Practitioners (NPs) to coordinate clinical management, including prescription of antibiotics. CHNs and AHWs are also well placed to support clinical care, particularly:

- administration of oral, intramuscular and topical antibiotics;

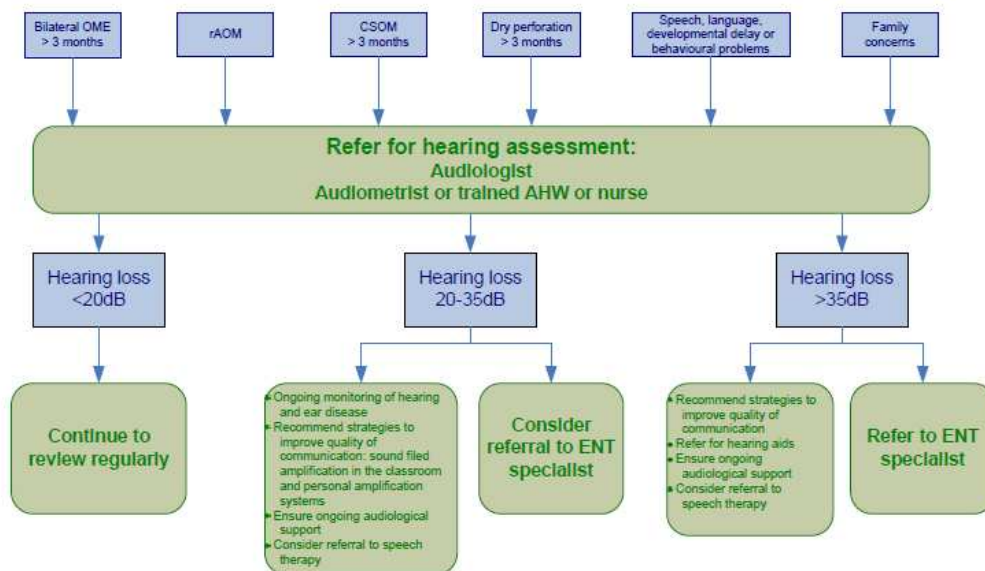
- ear cleaning including syringing and dry mopping
- monitoring general health and development of children affected by OM
- parent/carer education and support.

**A note about antibiotic resistance:**

In the Aboriginal population in the north of Australia, there has been an increasing and higher level of resistance to penicillin and ceftriaxone in pneumococci isolated from patients with invasive disease<sup>2,3</sup>. In a NT study of hospitalised Aboriginal children conducted in the mid 1990s, 27% of the pneumococci carried in the nasopharynx of children demonstrated intermediate penicillin resistance and 34% demonstrated intermediate ceftriaxone resistance<sup>4,5</sup>. Levels of pneumococcal resistance to penicillin decreased again following the introduction of the pneumococcal conjugate vaccine, but this situation will require ongoing monitoring.

Recurrent AOM, OME and CSOM can be managed in the primary care sector, but support from ENT specialists can maximise the confidence and skills of primary care practitioners in this area. Primary care practitioners should refer clients for specialist review and management according to the algorithm included in the [Recommendations for Clinical Care Guidelines for the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations](#)<sup>6</sup> and summarised below:

**Figure 2: Algorithm - Referral to specialist services** (modified from Commonwealth guidelines<sup>6</sup>)



It is essential that specialists communicate outcomes of review and treatment to local primary care teams who are not only able to support specialist care but are able to monitor the overall health of their clients and identify health changes early.

Primary health care programs to address OM should be developed in partnership with Medicare Locals and the Aboriginal community controlled health sector, and be consistent with the National and WA Primary Health Care Strategies <sup>30</sup>.

<b>Recommendations</b>
An <b>OM management plan for children in rural and remote areas</b> should be developed. This plan should be fully costed, focus on primary health services and based on a multi-sectoral approach including links with Medicare Locals, the Aboriginal community controlled sector and non-government agencies.
<b>Coordination</b> across the patient journey must increase, including: <ul style="list-style-type: none"><li data-bbox="292 701 1380 806">▪ <b>care coordination</b> at the client level - to ensure that the individual children are able to access timely treatment and are not lost in the system. This coordination may be incorporated into other health liaison roles;</li><li data-bbox="292 819 1380 953">▪ <b>operational service coordination</b> across government, Aboriginal-controlled and non-government sectors to reduce service duplications and gaps. This should include coordination of visiting schedules, resources, patient record systems and other high priority health programs (for example, dental services).</li></ul>
The role of <b>telehealth</b> in primary care and specialist management should expand through consolidation of investment in resources across sectors.

## 4.2 Specialist management

The best way to describe current specialist services is 'hit and miss.' Some children are referred to, seen by and appropriately clinically treated by ENT specialists and audiologists when required and close to home. Anecdotal reports include examples where others have a revolving door experience during which they have multiple referrals to multiple services which don't connect at the right time or place. They may not actually be seen by any specialist and continue to experience OM and associated hearing loss.

Difficulties in accessing specialist assessment and management for OM are amplified by:

- geographical isolation – children who live in rural and remote communities who do not receive services from visiting ENT specialists and audiologists need to travel to regional centres or Perth;
- multiple health problems – OM may not be the first priority for families when children or other family members have multiple health problems;
- seasonal conditions – many parts of northern Western Australia are isolated by monsoonal flooding from November through to April each year. During this time, it is difficult for families to travel to regional centres for assessment and treatment, and visiting specialists are less likely to visit remote areas.

It is unrealistic to expect that children living in every remote community will be able to have specialist ENT and audiology assessment and ENT surgery in that community. It is, however, reasonable for these children to have the opportunity to access these services at regional centres and to be provided with assistance to travel to these centres. If prevention and primary health care strategies are improved, the need for surgical intervention should decline.

### ENT Specialists

Ear, Nose and Throat (ENT) specialists provide expert medical and surgical services for conditions affecting the ear, nose, throat, head and neck. While GPs are able to diagnose OM, prescribe antibiotics and provide other medical management, individuals with persistent and chronic ear infections should be reviewed by an ENT specialist. Ideally, audiometric testing will occur prior to ENT specialist review to provide information about hearing loss which will guide clinical decisions.

Specialist ENT review can occur face to face or via telehealth and can result in:

- recommendations to the GP for continuing or alternative medical management;
- surgical intervention under anaesthesia, including insertion of grommets, myringotomy, myringoplasty, tympanoplasty, mastoidectomy, adenoidectomy and tonsillectomy;
- referral to audiological services for further assessment of hearing loss and/or intervention such as sound-amplification systems, personal hearing aid and auditory training.

Referral to audiology, prescription of long term antibiotics, use of 'watch and wait' strategies and/or progress to surgical intervention are guided by the [Recommendations for Clinical Care Guidelines for the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations](#)<sup>6</sup> but, in practice, experienced ENT specialists will use individual clinical judgement and experience to guide their decisions.

In June 2011, 40 ENT specialists registered with the Australian Health Practitioner Regulation Agency identified Western Australia as their principal place of practice, although a headcount of practising ENT surgeons amounted to 37<sup>31</sup>. While there are only five ENT surgeons with post fellowship paediatric subspecialty qualifications, all ENT surgeons have paediatric training and are qualified to provide services to children.

Of the ENT surgery workforce in Western Australia, 41.4% work in the private sector and the remainder work in both the private and public sector. Most (75.6%) ENT surgeons are employed in metropolitan locations only.

WA Health workforce assessments indicate that there is a current shortage of ENT specialists in relation to population numbers and that this undersupply will continue without implementation of recruitment and retention strategies, and investment in resources required to enable ENT surgery (theatre equipment and staff). Other strategies that can be implemented in collaboration with specialist colleges, the private sector and Rural Health West include vocational training, simulated learning environments and rural incentives.

Access to these private specialists via GP referral is relatively easy for families living in the metropolitan area and who have sufficient financial resources to pay fees not covered by Medicare. Surgical ENT services are available in both private and public hospitals in Perth. Families with private health insurance can access surgical services with minimal waiting but those using public hospital surgical services can have wait times of up to three and a half years, two years for consultation, then 18 months for surgery<sup>31</sup>.

A number of ENT specialists visit rural and remote areas but there is no coordinated approach to provision of these services. Some specialists have long term arrangements with local hospitals and medical consulting rooms, and some are supported from Rural Health West to provide services in remote and rural areas. ENT specialists are also members of the teams that provide services via the Telethon Ear Bus and Children's Equity.

Princess Margaret Hospital (PMH) for children has availability for weekly Wednesday morning telehealth consultations either live or by 'store and send'. This has mainly involved the Kimberley but opportunities exist in the Great Southern, Goldfields and Pilbara.

Paediatric ENT surgery in rural areas is limited by availability of ENT surgeons and specialist paediatric anaesthetists, and there may be potential for mobile surgical teams to augment surgical ENT services. Plans to increase surgical services in regional areas should consider availability of specialist staff, capacity of existing hospital services, cost of purchase and maintenance of new surgical resources, and assurance of patient safety prior to investment in these options. They should also be linked to primary health plans to ensure patient pathways include all essential elements of care.

Mobile teams could undertake ENT assessment, audiological review and, if required, day surgery for adenoidectomy, insertion of grommets and myringoplasties using either existing hospital facilities or a surgical bus. Surgical buses have been used in other Australian states, but their viability in remote Western Australia is not known.

The infrastructure required to ensure that ENT surgical services are available in every community is expensive and it is difficult to predict OM-related ENT surgery requirements in remote areas. The Child Health Check Initiative in the Northern Territory provided ENT services to 2,643 children between 1 July 2009 and 31 December 2010<sup>12</sup> and ENT surgery on 283 of these children suggesting that approximately 10% of children with OM may require surgery.

**A note about the patient journey:**

For communities who consider ear infections as a common, unavoidable part of childhood, completing the journey to effective treatment and prevention of permanent deafness is long and treacherous. Many people drop out and, because of this, others do not start the journey.

It is not enough to develop referral pathways and treatment protocols without considering how accessible these are to families and communities who have no transport, limited income and multiple competing social and health related priorities.



## Audiologists

Availability of and access to audiology service varies across the state but is generally poor. Audiology positions within WA Health can be vacant for long periods and patient waiting lists are long. Referral pathways should include hearing assessment which can inform clinical decisions, but children are frequently not able to have audiometric testing before ENT specialist review. This causes delay in clinical decision making during which time ear disease status may change and developmental milestones may be delayed due to hearing impairment.

Most audiologists in Western Australia work with the non-Government or private sectors in the area of hearing aid provision and work predominantly in the metropolitan area. Australian Hearing currently visit many rural and remote communities but do so under contract from the Commonwealth Department of Health and Ageing to provide hearing tests and aids to eligible people with long term or permanent hearing loss. Children with temporary hearing loss associated with OM are not eligible for these audiology services. This means that best practice in terms of specialist hearing testing and provision of sound amplification and/or hearing aids to enable speech development and learning is not available in many parts of the Western Australia.

Workforce predictions estimate a doubling of the absolute number of audiologists, and an increase in relative numbers from 5.29 full time equivalent audiologists per 100,000 persons to 9.71 full time equivalent audiologists per 100,000 persons between 2006 and 2020.<sup>32</sup> It is important that this growth in workforce is reflected in the availability of public audiology services for populations with high prevalence of OM, particularly Aboriginal and refugee children.

Recommendations
In conjunction with Medicare Locals, the tertiary education sector and specialist colleges WA Health should develop a <b>workforce plan</b> to build an otitis media primary care workforce and ensure adequate supply of specialists. This plan should include investment in training primary care Nurse Practitioners who can diagnose and prescribe treatment for otitis media, strategies to ensure access to General Practitioners (GPs) and training of GPs, ENT specialists and audiologists.
The Chief Health Professions Office and the Clinical Training Network should review the training, clinical placement and employment opportunities for <b>audiology</b> and <b>speech pathology</b> students and graduates.

## 5. Management of hearing loss

The hearing loss associated with OM can contribute to delays in speech development. Children with OM may also have other factors which impact negatively on language development – English as a second language, low SES, limited access to educational pre-school learning opportunities such as playgroups, parents affected by drugs and/or alcohol. Hearing loss will negatively impact on learning, language development, reading and balance and subsequently impact on school attendance, performance, behaviour and long term life choices.

Activities to limit the impact of temporary hearing loss on learning and development can take place in three settings:

- at home with family and community members;
- in schools;
- in health care settings.

### **A child is part of a family and community**

It is important to target prevention and management programs at families and communities rather than only at individuals, because care of children in many cultures is considered a shared responsibility. It is also important to recognise the hearing impairments that exist in adults who had chronic OM as children. Parents with hearing impairments are less likely to hear health instructions and recognise normal language development. If the majority of adults in a family or community have hearing impairments, there is a possibility that poor hearing can become an expectation rather than an anomaly.

Short term hearing loss can be managed by provision of sound amplification for individuals or for entire classrooms when many children within a school are affected. All classrooms in the Kimberley and some classrooms in other regions are fitted with sound amplification systems. Classrooms with high rates of reverberation are not suitable acoustic environments for students with conductive hearing loss and there are currently no minimum standards for reverberation levels in classrooms. Improving classroom acoustics improves the signal to noise ratio between the teacher's voice and the level of background noise. Effective teaching strategies and improvements to the acoustic environments will benefit all students and this type of information can be included in staff induction training in rural and remote areas. A resource package was distributed to schools in 2002: *Do You Hear What I Hear* resource and website [www.doyouhear.org.au](http://www.doyouhear.org.au) and its use could be more effectively promoted.

Hearing aids for individuals can also be beneficial but require provision and review by an audiologist. There can also be resistance to wearing of hearing aids by children although embedding the devices in headbands or hats has been effective in increasing compliance.

Children with developmental delay related to hearing loss can be referred to WA Health child development services which can include audiology, speech pathology and occupational therapy. Younger children with more complex

developmental issues are given highest priority but there are significant wait lists for services in the metropolitan area. Some rural and remote areas have minimal or no child development services and children requiring services may need to travel large distances to access them. Private therapists also provide child development services and access is dependent on availability and capacity of the family to pay.

As OM is endemic in some communities, a whole of community approach to managing hearing loss, and the impact it has on development, is required. It is also important to consider that many adults currently caring for children with hearing loss experienced the impact of hearing loss as children themselves. This means that they may not be able to hear health instructions or participate fully in language development of their children.

### Recommendations

**Coordination** across the patient journey must increase, including **strategic coordination** between:

- WA Health;
- Commonwealth Department of Health and Ageing, including the Office of Aboriginal and Torres Strait Islander Health;
- WA Department of Education;
- WA Department of Indigenous Affairs;
- Aboriginal Community Controlled Health Organisations;
- WA Regional Development Council;
- WA Local Government Association;
- Medicare Locals;
- Research and education sector;
- Department for Child Protection;
- Department for Communities;
- Disability Services Commission.

which may include the establishment of an Otitis Media Strategic Reference Group which oversees strategic investment in and outcomes from otitis media prevention and treatment programs.

WA Health should collaborate with the Department of Education, Aboriginal community controlled sector, Commonwealth departments and non-government agencies to develop a resource plan for **hearing aids, sound amplification** and **child development therapy** to address temporary and permanent hearing loss in populations with high prevalence of OM.

## 6. Definitions

**Acute Otitis Media (AOM):** General term for both acute otitis media without perforation and acute otitis media with perforation. It is defined as the presence of fluid behind the eardrum plus at least one of the following: bulging eardrum, red eardrum, recent discharge of pus, fever, ear pain or irritability. A bulging eardrum, recent discharge of pus, and ear pain are the most reliable indicators of AOM.

**Acute Otitis Media with Perforation (AOMwiP):** Discharge of pus through a perforation (hole) in the eardrum within the last 6 weeks. The perforation is usually very small (a pinhole) when the eardrum first ruptures. The perforation can heal and re-perforate after the initial onset of AOMwiP.

**Acute Otitis Media without Perforation (AOMwoP):** The presence of fluid behind the eardrum plus at least one of the following: bulging eardrum, red eardrum, fever, ear pain or irritability. A bulging eardrum and/or ear pain are the most reliable indicators of AOMwoP.

**Adenoidectomy:** A surgical operation to remove the adenoid tissue at the back of the nose (near the tonsils).

**Audiometry (Hearing Assessment):** The testing of a person's ability to hear various acoustic stimuli.

**Chronic Suppurative Otitis Media (CSOM):** Persistent ear discharge through a persistent perforation (hole) in the eardrum. Definition of CSOM varies in the duration of persistent ear discharge (from 2 weeks to 12 weeks). Importantly, the diagnosis of CSOM is only appropriate if the tympanic membrane perforation is seen and if it is large enough to allow the discharge to flow out of the middle ear space.

**Cholesteatoma:** This occurs when the normal lining skin of the eardrum accumulates in the middle ear or other part of the temporal bone. A diagnosis is made by the visualisation of a white mass in the tympanic membrane or middle ear and surgical management is necessary for this condition.

**Conductive Hearing Loss (CHL):** Hearing loss that results from dysfunction of the outer or middle ear that interferes with the efficient transfer of sound to the inner ear. It is characterised by a loss in sound intensity.

**Dry Perforation:** Presence of a perforation (hole) in the eardrum without any signs of discharge or fluid behind the eardrum. Some people also refer to this as inactive CSOM.

**Grommet (tympanostomy tube):** A small tube surgically placed across the eardrum to re-establish ventilation to the middle ear. It is also called a 'ventilation tube', a 'PE tube' (pressure equalisation tube), or a 'tympanostomy tube'.

**Hearing loss:** Any hearing threshold response outside the normal range that is detected by audiometry. It can be at any test frequency in either ear.

**Mastoidectomy:** A surgical operation to remove infected mastoid air cells in the mastoid bone.

**Mastoiditis:** Infection of the mastoid air cells of the mastoid bone (behind the middle ear).

**Meningitis:** A serious, sometimes fatal illness in which a viral or bacterial infection inflames the meninges, causing symptoms such as severe headaches, vomiting, stiff neck, and high fever.

**Myringoplasty:** A surgical operation to repair a damaged eardrum.

**Myringotomy:** A surgical incision in the eardrum to drain fluid.

**Otitis Externa:** Infection of the ear canal associated with pain, swelling and discharge. Other terms have also been used to describe otitis externa (including 'tropical ear' and 'swimmers' ear'). This is not a form of OM.

**Otitis Media (OM):** Refers to all forms of inflammation and infection of the middle ear. Active inflammation or infection is nearly always associated with a middle ear effusion (fluid in the middle ear space).

**Otitis Media with Effusion (OME):** Presence of fluid behind the eardrum without any acute symptoms. Other terms have also been used to describe OME (including 'glue ear', 'serous otitis media' and 'secretory otitis media'). OME may be episodic or persistent. A type B tympanogram or reduced mobility of the eardrum on pneumatic otoscopy are the most reliable indicators of OME.

**Otoscopy:** Looking in the ear with a bright light to identify features associated with outer or middle ear disease. This is sometimes referred to as 'simple otoscopy'.

**Persistent (Chronic) Otitis Media with Effusion:** Presence of fluid in the middle ear for more than 3 months without any symptoms or signs of inflammation.

**Pure-tone Audiometry:** The assessment of hearing sensitivity for pure-tone stimuli in each ear. This is done using headphones (air conduction) or via bone conductors (bone conduction). Testing is possible from around 3 years of age.

**Pneumatic Otoscopy:** The combination of simple otoscopy with the observation of eardrum movement when air is blown into the ear canal. Pneumatic otoscopy is able to determine mobility of the eardrum. Reduced mobility of an intact eardrum is a good indication of the presence of middle ear fluid.

**Recurrent Acute Otitis Media (rAOM):** The occurrence of 3 or more episodes of AOM in a 6 month period, or occurrence of 4 or more episodes in the last 12 months.

**Screening for Hearing Loss:** Any measurement (completed at a single point in time) that aims to identify individuals who could potentially benefit from an intervention for hearing loss. This may include the use of risk factors, symptoms, signs, electro-acoustic tests or behavioural tests for the detection of existing or future hearing loss.

**Screening for Otitis Media:** Any measurement (completed at a single point in time) that aims to identify individuals who could potentially benefit from an intervention for OM. This may include the use of symptoms, signs, laboratory tests, or risk scores for the detection of existing or future middle ear disease.

**Sensorineural Hearing Loss:** Hearing loss that results from dysfunction in the inner ear (especially the cochlea). This is where sound vibrations are converted into neural signals. This type of hearing loss may also occur secondary to dysfunction of any part of the auditory nerve.

**Surveillance for Otitis Media:** The systematic and ongoing collection, analysis and interpretation of measures of middle ear disease and hearing loss in order to identify and correct deviations from normal.

**Telehealth:** Telehealth is the use of telecommunication technologies such as videoconferencing that bridges the distance for consumers and health workers in their access to health services.

**Tympanocentesis:** The insertion of a needle through the tympanic membrane in order to aspirate fluid from the middle ear space.

**Tympanometry:** An electro-acoustic measurement of the stiffness, mass and resistance of the middle ear (more simply described as mobility of the eardrum). This test can be used to describe normal or abnormal middle ear function.

**Tympanoplasty:** A surgical operation to correct damage to the middle ear and restore the integrity of the eardrum and bones of the middle ear.

**Video otoscopy:** Observing the eardrum via a small camera placed in the ear canal. The image is displayed on a screen. Video pneumatic otoscopy (including images of eardrum mobility) is also possible.

## Appendices

### Appendix 1 Ear health education resources

From [EarInfoNet](#)

Title	Date	Author	Type
'The ear video' and workbooks	2002	Child Health Division	Audiovisual
A parent's story [podcast]	2012	Brisbane Indigenous Media Association	Audiovisual
A sticky issue: Otitis Media and Indigenous children [DVD]	2010	Swan, N. Daby, J. Jones, R. McIntosh, D. White, A. Rural Health Education Foundation	Audiovisual
Aboriginal ear health manual	2008	Coates, H. Vijayasekaran, S. Mackendrick, A. Leidwinger, L. et al.	Report
All ears: healthy hearing in Indigenous communities [DVD]	2010	Swan, N. Daby, J. Jones, R. McIntosh, D. White, A. Rural Health Education Foundation	Audiovisual
Antibiotics-puy Dhawu (Antibiotics Story) [DVD is in Yolŋu Matha language with English subtitles]	2009	Dhurrkay, Y. Mitchell, A.	Audiovisual
Australian Hearing: resources	2008	Australian Hearing	Resource package
Care for Kids' Ears kit for early childhood and community groups	2011	Australian Department of Health and Ageing	Resource package
Care for Kids' Ears kit for parents and carers	2011	Australian Department of Health and Ageing	Resource package
Care for Kids' Ears kit for teachers and teachers' aides	2011	Australian Department of Health and Ageing	Resource package
Care for kids' ears: Otitis media resources for health professionals	2011	Australian Department of Health and Ageing	Resource package
Choosing equipment for examining ears and testing hearing	2007	Boswell J	Report
Conductive hearing loss and ear infections	2009	Howard, D.	Booklet
Cooooee! Can ya hear me?	2006	Streetwize Communications	Comic
Craig Brinnin [podcast]	2012	Brisbane Indigenous Media Association	Audiovisual
Deadly ears	2012	National Aboriginal Community Controlled Health Organisation	Comic
Deadly ears [podcast]	2011	Brisbane Indigenous Media Association	Audiovisual
Do you hear what I hear?	2011	Derbarl Yerrigan Health Service	Brochure
Do you hear what I hear? Living and learning with conductive hearing loss/otitis media [resource kit]	2009	Aboriginal Education Directorate	Resource package
DxEAR-SL (Diagnostic Ear	2006	Ploof, D. Kaleida, P.H.	Audiovisual

Title	Date	Author	Type
Assessment Resource-Self Learning) & DxEAR-SA Diagnostic Ear Assessment Resource			
Ear and hearing care	2007	Northern Territory Government	Flipchart
Ear education is key [ABC radio broadcast Mornings with Ann Jones]	2012	Jones, A. Snowdon, W.	Audiovisual
Ear examination	2006	Menzies School of Health Research	Stickers
Ear examination and treatment	2006	Menzies School of Health Research	Leaflet
Ear health program	2009	Sunrise Health Service	Brochure
Ear health protocol	2011	Kimberley Aboriginal Medical Services Council	Brochure
Exposure to excessive noise posters	2011	Howard, D.	Poster
Good health starts with clean hands: boy washing hands	2010	SA Health	Poster
Good health starts with clean hands: healthy lifestyle	2010	SA Health	Poster
Happy little ears	2011	Aboriginal Health Team	Resource package
Have you heard? Helping Aboriginal and Torres Strait Islander peoples to hear better	2008	Australian Hearing	Factsheet
Hear this: supporting Aboriginal learners and employees who have hearing loss	2011	Howard, D. Human Services Training and Advisory Council	Electronic source
Hearing in the classroom	2008	Australian Hearing	Factsheet
Hearing is everyone's business: If you can't hear you can't learn	2010	Azithromycin for Asymptomatic Acute Otitis Media (AAAOM team)	Poster
Hearing loss among Indigenous inmates in the NT	2011	Howard, D. VanDerPoll, T.	Poster
Hearing loss as you age: hearing loss is common	2008	Australian Hearing	Factsheet
Hearing loss prevention [podcast]	2012	Brisbane Indigenous Media Association	Audiovisual
How is otitis media treated? [podcast]	2012	Brisbane Indigenous Media Association	Audiovisual
Hygiene for kids [podcast]	2012	Brisbane Indigenous Media Association	Audiovisual
Indigenous health snapshot	2012	Australian Institute of Health and Welfare	Factsheet
Jabby and Friends [DVD]	2006	Batty, D. Knox, G.	Audiovisual
KAMSC ear health promotion resources	2012	Kimberley Aboriginal Medical Services Council	Resource package
Kids ears are important!	2007	Menzies School of Health Research	Poster
My trip to hospital	2011	Deadly Ears program	Resource package
No germs on me	2008	Northern Territory Department of Health and Families	Poster



Title	Date	Author	Type
Nutrition [podcast]	2012	Brisbane Indigenous Media Association	Audiovisual
Occupational therapist [podcast]	2012	Brisbane Indigenous Media Association	Audiovisual
Otitis media	2009	Dharah Gibinj Aboriginal Health Service Aboriginal Corporation	Brochure
Otitis media and conductive hearing loss	2008	Phoenix Consulting	Poster
Otitis media and hearing loss [podcast]	2012	Brisbane Indigenous Media Association	Audiovisual
Otitis media animation 2 [online video]	2012	Ngaanyatjarra Media	Audiovisual
Otitis media prevention [podcast]	2012	Brisbane Indigenous Media Association	Audiovisual
Otitis media: don't get tackled, get checked [online video]	2012	Ngaanyatjarra Media	Audiovisual
Pneumococcus and otitis media	2006	Menzies School of Health Research	Poster
Sarah and Charlie [podcast]	2012	Brisbane Indigenous Media Association	Audiovisual
Signs of otitis media [podcast]	2012	Brisbane Indigenous Media Association	Audiovisual
Soundfield Amplification for the classroom	2008	Australian Hearing	Factsheet
Speaking from experience	2012	RealTime Health	Audiovisual
Step by step handwashing	2010	Kimberley Aboriginal Medical Services Council	Poster
Strong kids, no smoke story	2011	Howard, D.	Poster
The breath, blow, cough, wash and chew resources	2008	Fatnowna, S.	Resource package
The conductive hearing loss story	2008	Phoenix Consulting	Audiovisual
The ear troubles kit	2003	Phoenix Consulting	Resource package
The Snot Song Education Resource	2007	Education Consultancy	Resource package
Transmission of otitis media	2006	Menzies School of Health Research	Poster
What is otitis media?	2010	Australian Hearing	Factsheet
What is otitis media? [podcast]	2012	Brisbane Indigenous Media Association	Audiovisual
Young children and otitis media [podcast]	2012	Brisbane Indigenous Media Association	Audiovisual
Your ears get a cold too [podcast]	2012	Brisbane Indigenous Media Association	Audiovisual

## Appendix 2 Ear screening programs in Western Australia

Screening service	Delivered by	Target population/s	Screening undertaken
Child and Adolescent Community Health (CACH) and WA Country Health Services (WACHS) birth to School Entry Universal Contact Schedule - Statewide	Nurses Aboriginal Health Workers (AHWs)	All children aged 0-4 years	Assessment of milestone achievement including language. Discussion with parent/carer to identify any concerns about hearing. Otoscopy, audiometry and tympanometry may be performed if there is concern about ear disease and if the practitioner is confident of skills in these areas. Hearing check, otoscopy and audiometry at school entry
Enhanced Aboriginal Child Health (EACH) schedule funded from the Closing the Gap program by CACH and WA Country Health Services WACHS - statewide	Nurses AHWs	Families who are identified through the universal schedule as having higher needs	Assessment of milestone achievement including language. Discussion with parent/carer to identify any concerns about hearing. Otoscopy, audiometry and tympanometry may be performed if there is concern about ear disease and if the practitioner is confident of skills in these areas. Age appropriate ear health screening is offered at every contact visit.
Child Health Checks undertaken by Aboriginal Community Controlled Health Organisations (ACCHOs) – in communities with an Aboriginal Medical Service (AMS)	GPs Nurses AHWs	All Aboriginal children at 2 monthly intervals until 12 months of age and then at 2 and 2.5 years	Assessment of milestone achievement including language. Discussion with parent/carer to identify any concerns about hearing. Otoscopy and tympanometry may be performed if there is concern about ear disease
Telethon Ear Bus - metropolitan area, south-west region and the Pilbara.	GPs Audiologists Earbus screeners Aboriginal Liaison Officers Nurses ENT specialists	School children (by invitation of principals after promotion of service).	Otoscopy Tympanometry Audiometry Review by ENT specialist
Children's Equity Remote Ear Disease Program	GPs Audiologists ENT specialists	Children in remote Aboriginal communities	
Derbarl Yerrigan Aboriginal Health Service-specific metropolitan and rural schools	Nurses AHWs	School children (by invitation of principals after promotion of service).	Otoscopy Tympanometry Audiometry

## Appendix 3 Practical treatment plans for otitis media

From the [Recommendations for Clinical Care Guidelines for the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations](#) (DOHA 2011)

Diagnosis	Management
<p><b>1. Aerated Middle Ear (Normal)</b></p>	<p><b>1. Family Education:</b> Discuss the normal language development milestones and the importance of going to the health centre if their child develops ear discharge.</p>
<p><b>2. Episodic OME</b> Fluid in middle ear without symptoms.</p>	<p><b>1. Family Education:</b> Advise the family about the likely hearing loss (usually around 25dB) and the need to re-examine the child in 3 months time (see chronic OME below). Discuss the normal language development milestones and the importance of going to the health centre if their child develops ear discharge.</p>
<p><b>3. Persistent OME</b> Fluid in the middle ear without any symptoms for greater than 3 months.</p>	<p><b>1. Family Education:</b> Advise the family about the likely hearing loss (usually around 25dB) and the need to organise a hearing test if chronic ear disease affects both ears. Treatment will be determined by the level of hearing loss in the better hearing ear. Discuss the normal language development milestones and the importance of going to the health centre if their child develops ear discharge.</p> <p><b>2. Medical:</b> Review every 3 months. Recommend referral for grommet surgery if OME persists for &gt;3months and hearing loss &gt;35dB, or if severe retraction of the eardrum is present (i.e. retraction pocket or atelectasis).</p> <p><b>3. Audiological:</b> Monitor for delay in language development. If hearing loss is 20-35dB, the child will benefit from classroom sound-field amplification and enhanced communication strategies (e.g. get close, speak clearly, check understanding etc). If hearing loss &gt;35dB, also refer for hearing aids.</p>
<p><b>4. AOMwOP (Acute Otitis Media)</b> Bulging of the eardrum or ear pain plus fluid in the middle ear.</p>	<p><b>1. Family Education:</b> Emphasise the need for adherence to antibiotics to prevent CSOM. Advise the family about the likely hearing loss (usually around 25dB). Discuss the normal language development milestones and the importance of going to the health centre if their child develops ear discharge.</p> <p><b>2. Medical:</b> Recommend at least 7 days amoxicillin (50mg/kg/day). Review at 4-7 days. If bulging persists, continue for further 7 days (90mg/kg/day). [If AOM associated with diarrhoea or pneumonia can use daily IM procaine penicillin 50mg/kg/day until clinically improved, then complete course with amoxicillin. If AOM associated with trachoma, can use single dose of 30mg/kg azithromycin. It should be noted that azithromycin is not currently licensed for use in children less than six months of age].</p>
<p><b>5. AOMwiP</b> Discharge through a</p>	<p><b>1. Family Education:</b> Emphasise the need to take medications as prescribed to prevent CSOM. Advise the family about the likely hearing loss (usually around 35dB). Discuss</p>

Diagnosis	Management
perforation.	<p>the normal language development milestones and the importance of going to the health centre if the ear discharge does not improve.</p> <p><b>2. Medical:</b> Recommend 14 days amoxicillin (50-90mg/kg/day). Review at 4-7 days, and again at 10-14 days. Continue antibiotics until discharge and eardrum bulging has resolved. [If AOM with perforation associated with diarrhoea or pneumonia can use daily IM procaine penicillin as above.]</p> <p>Persistent perforation despite amoxicillin 90mg/kg/day: change to amoxicillin-clavulanate (90mg/kg/day) for further 14-28 days and introduce cleaning of discharge followed by ciprofloxacin ear drops (2-5 drops 2-4 times a day). Continue to review weekly. [If child develops diarrhoea or pneumonia can use daily IM procaine penicillin 100mg/kg/day until clinically improved, then complete course with oral antibiotics.]</p>
<p><b>7. CSOM</b> Persistent discharge with an easily visible TM perforation.</p>	<p><b>1. Family Education:</b> Emphasise the need to take medications as prescribed and that treatment may need to continue for a long time. Explain that only profuse discharge will be visible outside of the ear canal. Discuss the normal language development milestones and the importance of going to the health centre if the ear discharge gets worse.</p> <p><b>2. Medical:</b> Clean the ear canal with dry mopping, syringing or suction. Dry and add ciprofloxacin eardrops (2-5 drops 2-4 times a day). Continue until ear has been dry &gt;3 days. Review 1-2 times weekly. Prolonged periods of the treatment may be necessary. Treatment is successful in up to 50% of children in some remote settings. If no improvement despite good compliance, consider admission to hospital for IV antibiotic treatment.</p> <p><b>3. Audiological:</b> Hearing loss usually around 35dB. Monitor for delay in language development. If hearing loss is 20-35dB the child will benefit from classroom sound-field amplification and enhanced communication strategies. If hearing loss &gt;35dB, also refer for hearing aids.</p>
<p><b>8. Dry Perforation</b> Perforation without any discharge for less than 3 months.</p>	<p><b>1. Family Education:</b> Advise the family about the likely hearing loss (varies from normal if perforation small to &gt;40dB if very large) and the need to re-examine the child in 3 months time (see chronic dry perforation below). Discuss the normal language development milestones and the importance of presenting early to the health centre if their child develops ear discharge.</p>
<p><b>9. Chronic Dry Perforation</b> Perforation without any signs of discharge for greater than 3 months</p>	<p><b>1. Family Education:</b> Advise the family about the likely hearing loss (varies from normal if perforation small to &gt;40dB if very large) and the need to organise a hearing test. Treatment will be influenced by the level of hearing loss in the</p>

Diagnosis	Management
	<p>better hearing ear. Discuss the normal language development milestones and the importance of going to the health centre if the child develops ear discharge.</p> <p><b>2. Medical:</b> If hearing loss &gt;35dB or having frequent infections with discharge, refer to ENT surgeon for consideration of eardrum repair.</p> <p><b>3. Audiological:</b> Monitor for delay in language development. If hearing loss is 20-35dB, the child will benefit from classroom sound-field amplification and enhanced communication strategies. If hearing loss &gt;35dB, refer for hearing aids.</p>

## Appendix 4 Operational Directive 0412/12



Government of **Western Australia**  
Department of **Health**

### OPERATIONAL DIRECTIVE

<b>Enquiries to:</b> Dr Gary Geelhoed	<b>OD number:</b> OD 0412/12
<b>Phone number:</b> 9222 2072	<b>Date:</b> 14 December 2012
<b>Supersedes:</b>	<b>File No:</b> F-AA-15201

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**Subject:** Clinical Management of Otitis Media

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The purpose of this Operational Directive is to provide consistent guidelines for the clinical management of otitis media.

#### INTRODUCTION

Otitis media (OM) is a common childhood illness, from which most children will recover quickly with appropriate treatment. Some population groups, however, have much higher rates of OM and also have unacceptably high rates of chronic suppurative OM (CSOM) with associated impact on hearing, language development and learning ability. Australian Aboriginal children have the highest rate (up to 70% in remote communities) of CSOM in the world.

#### BACKGROUND

In response to this health issue, a number of Government and non-government agencies are implementing specific health programs. WA Health has recognised that coordination of health care across the age and intervention spectrums is essential if OM prevalence and impact are to be reduced. It has commissioned the development of a Model of Care (MoC) for Otitis Media and work on this has commenced.

The Australian Government Department of Health and Ageing has published [Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations](#) which are being widely promoted within the primary health care sector across Australia. These guidelines have been developed using National Health and Medical Research standards of clinical evidence.

Although these guidelines refer specifically to Aboriginal and Torres Strait Islander populations, the clinical evidence for medical management of otitis media is applicable to all populations.

#### CLINICAL MANAGEMENT OF OTITIS MEDIA

All health practitioners employed in WA Health should be able to access the **Recommendations for Clinical Care Guidelines on the Management of Otitis Media in Aboriginal and Torres Strait Islander Populations** and follow the recommendations in the relevant sections:

- Section A: Prevention of Otitis Media and Hearing Loss
- Section B: Diagnosis of Otitis Media
- Section C: Prognosis
- Section D: Medical Management of Otitis Media
- Section E: Audiological Assessment and Management

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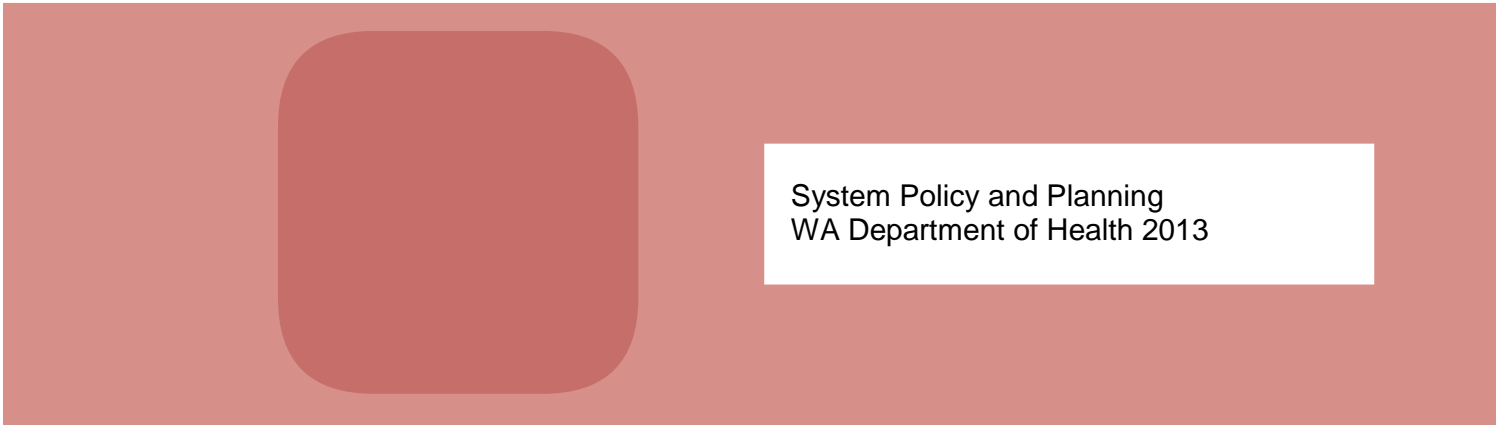
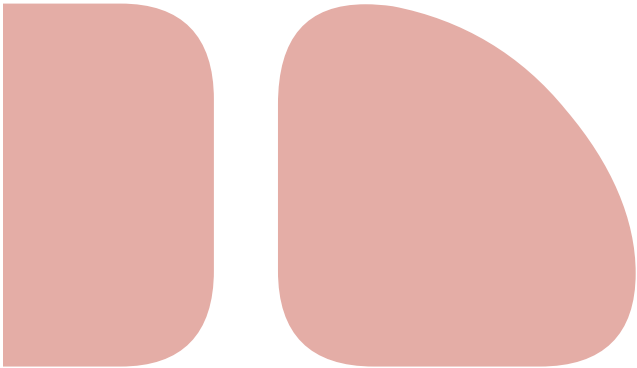
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