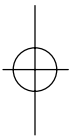
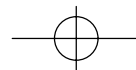


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University of Cape Town, ENT Department
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Disability Action Research Team (Dart)
Deaf Federation of South Africa (Deafsa)
Individual professionals in the health sector of the Republic of South Africa



1. INTRODUCTION

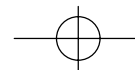
For humans, the primary means of communication is based on sound which also dominates the environment we live in. For most hearing people it is extremely difficult to imagine how life would be if they were not able to hear any sound. Hearing impairment and deafness affect millions of people in the world and our country is no exception.

Hearing problems not only have far-reaching effects on the development of a person's language and communication skills, they also have an impact on social and economic participation with serious implications for the person's quality of life. This may lead to dependence on family members and the State for financial assistance and support.

Early diagnosis and appropriate intervention are therefore of paramount importance not only in the interest of the person's quality of life, but also in terms of the cost of intervention at a late stage and support that would be necessary.

Middle ear problems are most common disorders worldwide and most arise from middle ear infection. While it can occur at any age, it is most common in young children, particularly during the first three years of life. Most middle ear infections resolve rapidly with treatment, but sometimes can go on to cause long-standing middle ear problems that can result in deafness and death. These problems can be either the result of persistent chronic infection or persistent presence of fluid in the middle ear. The morbidity is two fold: persistent/recurrent infection with or without a discharging ear and hearing impairment/deafness caused by interference with the ear's sound-conducting mechanism. Otitis media, if treated correctly at an early stage, is potentially a preventable cause of acquired deafness.

To provide a rational, cost-effective and user-friendly set of



- brain abscess,
- destruction or fixation of the middle ear structures responsible for conduction of sound into the inner ear,
- spread of infection into mastoid and inner ear,
- language developmental delay.

3.1 Target population

3.1.1 Primary target population for prevention

- children 0 - 6 years of age,
- health professionals.

3.1.2 Secondary target population:

- children 7-14 years of age,
- the general public.

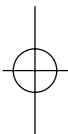
3.2 Service delivery

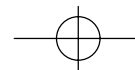
3.3 Service organisations

Department of Health (national office)
 Provincial Departments of Health

District Health System

INSTITUTION	HUMAN RESOURCES	SERVICES TO BE PROVIDED
Primary health care clinic Clinic/mobile clinic	Auxiliary nurses Professional nurses Health educators (if available)	Health promotion. Diagnosis and treatment of c media. Referral services
Community health centres	Professional nurses Doctors Audiologists/speech therapists	Health promotion. Referral centre for all referre from clinics/mobile clinics. If services are available, mc ticated investigations/proced surgical. Professional support to clinic clinics.
District hospital	Professional nurses Doctors Visiting health specialists Laboratory personnel Audiologists/speech therapists School health nurse	Referral services laboratory tions (if needed) e.g. culture sitivity. Audiology (if needed). Outreach specialist services. Professional support to comi health-care centres. Clinical training of staff at cli munity health-care centres a hospitals.





- Non-governmental organisations / Community organisations
- Private practitioners
- Local authorities
- Occupational health services
- Department of Education (national office)
- Provincial Departments of Education, especially primary schools, crèches and pre-schools
- Media structures and other communication structures
- Pharmaceutical industry

3.4 Objectives of this guideline

- Efficient integration of ear health care into comprehensive primary health-care services.
- Efficient integration between levels of ear care-givers.
- Responsive and accessible referral levels.

3.5 Resources

3.5.1 Human

- Trained primary health care - workers.
- Appropriate training and professional education for non-drug and drug management of otitis media.
- School teachers and school health nurses.

3.5.2 Financial

- n Adequate budget for drugs, supplies and equipment.
 - Treatment is free of charge for children under six years of age provided that:
 - Primary level is the level of entry in the referral system, except in cases of emergency.
- n Referral services:
 - User fees are determined by the service provider.

3.5.3 Supplies and equipment

- n Adequate supplies and equipment.

- Health education materials.
- Ensure continuous drug supply.

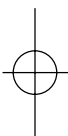
NB: Access to ear health care and necessary supplies needs to be geographically convenient to the patients.

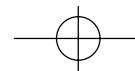
Etiology

- n In newborn infants usually escherichia coli and staphylococcus aureus.
- n Older infants and young children usually *Streptococcus pneumoniae, Haemophilus influenzae,*
catarrhallis or Staphylococcus aureus.
- n The relative frequency of the micro-organisms identified as causing acute otitis media varies according to their prevalence in the community at any given time (Merck Manual 1977)¹.

General symptoms of otitis media

- n Earache is the major symptom (acute otitis media), otherwise discomfort of the ear is experienced.
 - The affected ear may have otorrhoea.
 - Headache.
 - Other symptoms of coryza (head cold).
 - Children may have:
 - Irritability and difficulty in sleeping.
 - Pulling of the ear.
 - Runny nose, sore throat.
 - Fever and even febrile convulsions.
 - Diarrhoea and vomiting.





Otitis media is often caused by bacteria – resulting in fever, acutely painful ear, bulging red eardrum and ill-looking patient with/without a discharge from the ear.

High prevalence of otitis media has been attributed to overcrowding, inadequate housing, poor hygiene, not breast-feeding, poor nutrition, and high rates of naso-pharyngeal colonisation with potentially pathogenic bacteria. Poverty is a major risk factor. In general, bottle-feeding of babies while lying down and poor socio-economic conditions are predisposing factors.

Management of otitis media

If referral is deemed necessary, it should be generally understood that it is made to the next level of ear health care within the health system.

Prevention of otitis media

In preventing most childhood diseases, immunisation is the starting point. Children should be immunised at least in accordance with the requirements of the Expanded Programme of Immunisation (EPI).

Health education messages in relation to personal hygiene should target the known risk factors, some of which have been listed above. This should also include discouragement of negative practices such as assaulting others on the ears, especially children.

4.1 Acute otitis media

If effectively treated early, this will prevent the development of chronic otitis media.

The appearance of the eardrum is the main diagnostic feature:

at the beginning of the infection:

- the whole eardrum becomes pink and loses the light reflex,
- then red, particularly around the handle of the malleus,
- the eardrum bulges, losing all the landmarks of a normal eardrum,
- very painful ear.

at an advanced stage:

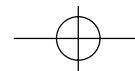
- hearing impairment is the major symptom
- the pain subsides,
- feeling of fullness in the ear is experienced,
- flow of exudate is experienced in middle ear with certain head movements,
- the eardrum then ruptures, leaving a perforation with a discharge.

These are sure features of acute otitis media.

4.1.2 Diagnostic procedure of acute otitis media

- n On history taking determine if the patient has:
 - pain in the ears,
 - itchy ears,
 - an experience of fullness and flow of fluid in the ears,
 - pus discharge and duration,
 - frequent tonsillitis,
 - snores at night.
- n Examine patient's general condition:
 - temperature,
 - pulse rate,
 - palpate lymph nodes in the neck (if enlarged or painful, this would indicate a possible complication),





- signs of a cold/nasal infection.
- n Examine the ears:
- inspect the pinna and peri auricular area for boils or other sores,
 - use an otoscope to inspect the external auditory canal and eardrum,
 - the whole eardrum may be pink and without the light reflex,
 - the eardrum may be red (vascular) particularly around the handle of the malleus,
 - the eardrum may be bulging and without all the landmarks of a normal eardrum such as the long process of the malleus, light reflex and the grey-like colour of the eardrum.

Check mastoid area for pain or swelling to exclude mastoiditis.

4.1.3 Referral

- n All patients with:
- inflammatory swelling and tenderness over the mastoid area,
 - neck stiffness, vomiting or who have had a change in their level of consciousness or are drowsy,
 - loss of balance (they may have vertigo),
 - a facial nerve paralysis (facial palsy),
 - a long-standing hearing loss (both conductive and sensorineural),
 - persisting/worsening signs of acute otitis media after 2 days following initiating treatment.

4.1.4 Management of acute otitis media

- n Give antibiotic (**and stress compliance**) with a specific emphasis that the patient must finish the medi-

- n *Amoxycillin 3 times a day orally for 5 days:*
- *Babies (<10kg) up to 6 months of age:* suspension 62.5mg.
 - *Infants (10-20kg) 6 months to 3 years of age:* suspension 125mg.
 - *Children (>20kg) over 3 years of age:* suspension 250mg.
 - *Adolescents and adults:* tablets 250-500mg.

- n *Penicillin-allergic children:*
Trimethoprim/sulphamethoxazole suspension (40mg/200mg)/5ml 2 times a day for 5 days.
Babies 2-5 months: 2,5ml (suspension).
Infants and children 6 months up to 5 years of age: 5ml.
Children 5 to 12 years of age: 10ml or 1 tablet.

- n *Penicillin-allergic adolescents and adults:*
Trimethoprim/sulphamethoxazole tablets 80mg/400mg.
2 tablets twice a day for 5 days.

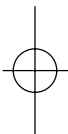
- n *Analgesic:*
Babies 3 months-1 year: paracetamol 2,5ml syrup (120mg/5ml) dose 4-6 hourly.
Children 1-5 years: paracetamol 5-10ml.
Children 5-12 years: paracetamol 0,5-1 tablet (500mg tablet).
n Children > 12 years and adults 1-2 tablets.

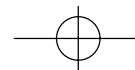
The ear may be discharging pus - treat as chronic otitis media if duration is longer than 2 weeks.

4.1.5 Follow-up

- n First follow-up 2 days after starting treatment

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- n Second follow-up 2 weeks after starting treatment:
 - Check if repeat prescription is necessary.
 - Do a hearing test, appendix A.
- n *Examine the ears:*
 - If the eardrum is normal and the hearing is normal, emphasise that the patient should finish the medicines and discharge him/her.
 - If the eardrum looks abnormal or dull and pink with a moderate hearing loss - treat as otitis media with effusion (section 4.2.).
 - If the eardrum looks normal and there is deafness - refer for a formal hearing test and to see an ENT specialist.
 - The ear may be discharging pus - treat as chronic otitis media with non-drug treatment therapy (section 4.3.).

4.2 Otitis media with effusion

4.2.1 Clinical features of otitis media with effusion

The abnormal functioning of the eustachian tube, cleft palate and unresolved acute otitis media are the major contributory factors to otitis media with effusion. n Moderate hearing impairment is the major symptom, usually bilateral.

- n The ear can be uncomfortable, or even painful at times.
- n Ringing in the ears (tinnitus) and occasional vertigo.
- n The eardrum is intact with increased vascularity:
 - it may be retracted or bulging depending on the middle ear pressure.
 - its light reflex disappears and looks dull.

For chronic otitis media with effusion:

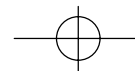
- n Snoring at night during sleep as a result of enlarged

- n Continuous runny nose with sneezing.
- n Children may have delayed language development.
- n Infants may stop babbling at 6-10 months of ages.
- n Children may not be pronouncing their words clearly, they may not even say the words but just the intonation.
- n There may be frequent tonsillitis resulting in obstruction of the eustachian tube from opening.

4.2.2 Diagnostic procedure of otitis media with effusion

- n On history taking determine if there are any of the following:
 - recent acute otitis media,
 - ear uncomfortably painful (can be at times),
 - snoring at night during sleep (usually as a result of enlarged adenoids),
 - fluctuating hearing loss and attention levels,
 - continuous runny nose with sneezing,
 - delayed language development,
 - not pronouncing their words clearly, they may not even say the words, but just the intonation (common in young children),
 - frequent tonsillitis.
- n Examine the ear to see if the eardrum is:
 - intact and abnormal in colour (pinkish or yellowish),
 - retracted or bulging depending on the middle ear pressure,
 - dull with an increase in visibility of blood vessels, especially around the handle of the malleus (vascular),
 - without the light reflex.
- n Unless very experienced in otoscopy, changes that occur on an eardrum with this condition will probably not be recognised:





- impairment such as:
 - pus discharge from the ear canal (caused by otitis external) or
 - foreign body lodged in the ear canal.

- n *Test the hearing with a voice test, appendix A:*
 Note that if the child cannot hear your conversational voice and in the absence of any obvious pathology, something else may be causing deafness; these patients should be referred immediately for an audio-logical assessment.
 - patients with a middle ear effusion will not be able to hear your whispered voice clearly (unless the condition is unilateral), but should be able to hear your conversational voice.

4.2.3 Referral

Most of these effusions settle by themselves, but if the effusion persists for more than a month after appropriate treatment then immediate referral is necessary especially if it precedes acute otitis media.

4.2.4 Management of otitis media with effusion

- n The first step is to see whether the effusion will clear by itself within two weeks.
- n A repeat prescription may be necessary if it follows acute otitis media.
- n Arrange to see the patient weekly after starting treatment.
 - Repeat the hearing test (appendix A) and examine the ears again on each visit.

If the hearing test is normal and the eardrums look normal then discharge the patient, but emphasise that he/she must return for a review if they think that the hearing has deteriorated again.

If there is still a hearing impairment then refer the patient for a formal hearing test and to see either a doctor or ENT specialist.

4.3 Chronic otitis media

4.3.1 Clinical features of chronic otitis media

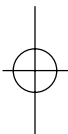
When there has been pus discharge from the middle ear for more than two weeks, the condition is usually referred to as chronic otitis media. This condition can come about as a result of poorly treated acute otitis media, cholesteatoma or tuberculosis of the middle ear.

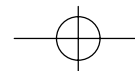
- n Many of the patients come from poor socio-economic situations.
- n Pus discharging ear for more than two weeks.
- n Hearing impairment.
- n Some patients may have a chronic nasal infection.
- n The ears are usually not painful. If they are painful then this indicates a possible complication developing and such patients must be referred immediately.
- n Some patients may have been getting recurrent tonsillitis in which the infection has spread into the middle ear.
- n Some patients may have a background of chronic infections such as in tuberculosis or acquired immunodeficiency syndrome (HIV/AIDS).

4.3.2 Diagnostic procedure of chronic otitis media

On history taking determine if:

- n the pus discharge follows a trauma or acute otitis media,
- n pus discharge from the ear has been going on for more than two weeks,





- * n ears are painful (ears are usually not painful), if so
- * then this indicates a possible complication developing
- * and such patients must be referred immediately,
- * n there has been recurrent tonsillitis (in which the infec-
- * tion spreads into the middle ear),
- * n the patient has any background of chronic infections
- * (sometimes he/she may have tuberculosis or
- * HIV/AIDS).

* Check patient's general condition:

- * n temperature,
- * n pulse rate,
- * n palpate lymph nodes in the neck (if enlarged or
- * painful, this would indicate a possible complication).

* Examine the ear:

- * n inspect the pinna, the opening to the ear channel and
- * area around ear for boils or other sores.

* Check mastoid area for oedema and tenderness.

* Use an otoscope to inspect external auditory canal and eardrum. If necessary, first dry-mop the auditory canal.

* A combination of pus discharge and a perforation of the ear drum is the main diagnostic feature. In addition to this, a foul smell can be experienced if the condition is due to a cholesteatoma.

* NB: **Not all otorrhoea is due to otitis media, if there is no perforation it may be due to infection in the ear canal (otitis externa).**

* 4.3.3 Management of chronic otitis media

* 4.3.3.1 Non-drug treatment:

* **Dry mopping** is of paramount importance (if the ear is discharging pus) in the management of chronic otitis media. It is also essential to keep the ear dry once the infection has resolved.

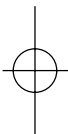
- * – The technique for dry mopping must be demonstrated to the patient or to the escort.
- * – Ear-drops of acetic acid 1% in sodium chloride 0.9% or vinegar diluted 1 part vinegar to 10 parts boiled water, should be instilled each time after the ear canal has been dry mopped.
- * – The technique of instilling the ear-drops into the ear canal, allowing it to run down to the eardrum and then 'pumping' the tragus cartilage must be taught to the patient (or the escort in the case of children).

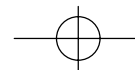
* First explain to the mother/escort that:

- * – pus in the ear canal must be removed to make it relatively dry,
- * – although mopping takes a long time, not doing it could cause the child to go deaf,
- * – repeated antibiotics and injections alone do not help.

* As you mop the patient's ear, tell the mother/escort to:

- * – wash her hands before undertaking the mopping exercise,
- * – roll a clean, soft, absorbent cotton cloth or soft, strong tissue paper (e.g. toilet paper) into a wick (never use a cotton-tipped applicator or flimsy paper that will fall apart in the ear; do not use a stick of any kind),
- * – place the wick in the child's ear and gradually advance it into the ear canal while twisting it in one





- replace the wick with a clean one,
- repeat these steps until the wick no longer gets wet.

Ephasise the following information to the patient/escort:

- wash hands before undertaking mopping exercise,
- mop the ear at least three times a day at home,
- use this treatment for as many days as it takes until the wick no longer gets wet when put in the ear canal and no pus drains from the ear (usually 1 - 2 weeks),
- the ear canal must not be blocked with anything between treatments.

Make sure the patient/escort understands that he/she must not:

- leave anything in the ear canal, such as cotton wool,
- put oil or any other fluid into the ear canal,
- swim or get water in the ear canal at all costs.

Ask the mother/escort checking questions such as:

- What materials will you use to make the wick at home?
- How many times each day will you dry the ear with a wick?
- What else will you put in your child's ear canal?

4.3.3.2 Antibiotic treatment

Take a pus swab if possible for culture and sensitivity to get an indication of what drug to use.

Same as for acute otitis media:

The most recommended approach to the management is to institute broad spectrum antibiotic therapy.

- *Babies (<10kg) up to 6 months of age:* suspension 62.5mg.
- *Infants (10-20kg) 6 months to 3 years of age:* suspension 125mg.
- *Children (>20kg) over 3 years of age:* suspension 250mg.
- *Adolescents and adults:* tablets 250-500mg.

n *Penicillin-allergic children:*
Trimethoprim/sulphamethoxazole suspension (40mg/200mg)/5ml 2 times a day for 5 days.
Babies 2-5 months of age: 2,5ml (suspension).
Infants and children 6 months up to 5 years of age: 5ml.

Children 5 to 12 years of age: 10ml or 1 tablet.

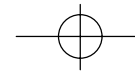
n *Penicillin-allergic adolescents and adults:*
Trimethoprim/sulphamethoxazole tablets 80mg/400mg.
2 tablets twice a day for 5 days.

n *Analgesic:*
Babies 3 months-1 year of age: paracetamol 2.5ml syrup (120mg/5ml) dose 4-6 hourly.
Children 1-5 years of age: paracetamol 5-10ml.
Children 5-12 years of age: paracetamol 0.5-1 tablet (500mg tablet).
Children > 12 years of age = adults 1-2 tablets.

4.3.4 Referral

- All patients who have pain associated with an ear that has been discharging for more than two weeks.
- All patients with inflammatory swelling and tenderness over the mastoid area.
- All patients with neck stiffness, vomiting or who have had a change in their level of consciousness or who





- All patients with a facial nerve paralysis.
- Large central perforation with significant hearing loss.
- Dry perforations resulting from any conditions.
- All perforations due to trauma with an advice that they should not introduce anything in the ear canal.
- All patients with pus discharge suspected to be the result of a cholesteatoma.
- All patients with speech, language and/or auditory perceptual problems.
- All patients not responding to treatment.

4.3.5 Follow-up

- Reassess two weeks after starting treatment to see whether the ear is getting dry.
- If it is not, continue with dry mopping and ear drops for another two weeks. If it is not improving, refer to doctor or ENT specialist.
- If the ear is dry, conduct a hearing test (Appendix A).
- Refer all patients with moderate to profound hearing loss.
- Refer all patients who still have a perforation if they have had more than one or two episodes of pus discharge from the ear.

Implementation of guidelines will be monitored and evaluated qualitatively and quantitatively to determine:

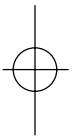
- n impact,
- n cost-effectiveness,
- n user-friendliness,
- n timely and correct treatment of otitis media.

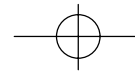
The voice test is not applicable to children younger than 12 months old, in which case the Swart Questionnaire can be used.

With normal hearing one should be able to understand what is being said in a whispered voice from 1 metre in a quiet room. If there were moderate hearing impairment then the speaker would have to speak in a normal voice. If there were severe to profound hearing impairment, the speaker would have to shout and the patient will still not be able to hear what is being said. These three volumes are the basis of the voice test.

To do the voice test, tell your patient to repeat after you what you are going to say to him/her (or in the case of smaller children, ask them to do something like 'Touch your nose', etc.).

Stand behind them at arm's length and say something in a soft whisper. If they accurately repeat what you have said they have normal hearing in at least one ear. If they cannot understand what you have said, say something else in a normal conversational voice. If they cannot hear your whis-





APPENDIX A not hear, say something else in a loud voice. If they cannot hear your conversational voice, but can hear your loud voice, then they have severe hearing impairment.

SWART QUESTIONNAIRE FOR USE IN ASSESSING HEARING IN BABIES

Baby only a few weeks old:

Does your baby appear to be listening to you when you talk or sing?
 Does your baby open its eyes or blink when there is a noise?

Baby about six months old:

Does your baby enjoy you talking or playing word games with you?
 Does your baby try to see where a noise is coming from by turning its eyes or head towards the noise?

Baby about nine months old:

Does your baby appear to enjoy babbling and making other noises?
 Does your baby appear to respond to very soft sounds?

Baby about a year old:

Is your baby starting to say baby words?
 Does your baby respond when you call its name and names

Baby about one and a half years old:

Is your baby starting to use simple words?
 Does your baby pick up or point to things around the house when you ask?

Babies of two years or older:

Is your baby putting words together and try to talk to you?
 Do you think your baby can hear normally even if you speak with a very soft voice?

If the answer is **no** to any of the above questions, the child should be referred for an audiological evaluation.

