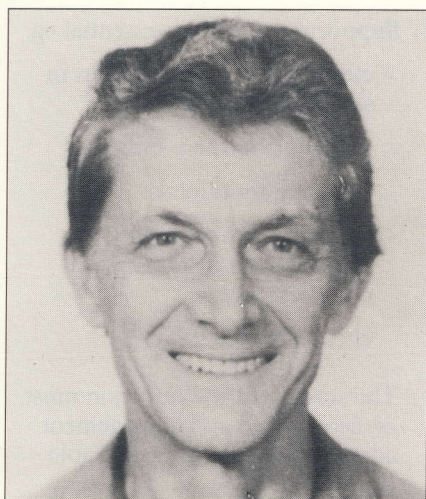


## Respiratory Infection in Childhood

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### Curriculum vitae

After obtaining the MBChB degree at the University of Cape Town, Professor Loening worked in several mission hospitals in the Transkei and Zululand. After spending time at King Edward VIII Hospital as Medical Officer and paediatrician he entered private practice as a paediatrician. Walter later returned to the University of Natal with the main aim of promoting health and preventing disease among children in the community. At the beginning of 1984 he was appointed the first incumbent of the Chair of Maternal and Child Health at the University of Natal. He has been active in research into a range of child health issues, including acute respiratory infection. He is a founder member of the Southern African Society for Prevention of Child Abuse and Neglect.

### Summary

*The prevalence of ARI is similar in all population groups, but the morbidity and mortality is much higher in disadvantaged groups. GPs should empower parents to manage their children by giving them the knowledge of the features and natural course of ARI, and alert them to notice any deviation from this.*

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### KEYWORDS:

Respiratory Tract Infections;  
Child; Physicians, family;  
Parents.

Although the main focus of this paper is on acute respiratory infection (ARI) an approach to the child with a chronic cough will be discussed.

ARI has been called an "international tragedy of almost unprecedented magnitude."<sup>1</sup> The reasons for this strong language are the lack of recognition of the magnitude of the problem and insufficient funding for research and for preventive programmes. It has been calculated that, on a global scale, one third of 15 million childhood deaths are due to pneumonia.<sup>2</sup> In developed countries such as the UK, ARI accounts for 10% of the under 5's mortality. In developing countries (eg Papua New Guinea) the case fatality varies from 25%, where no health care was available, to 1,9% where primary health care was provided.<sup>2</sup>

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It is not only the high mortality which is a cause of concern but also the long term morbidity, which appears to have escaped our notice until recently.

### Epidemiology

It must be strongly emphasized that the incidence of ARI does not vary from one community to another, but the morbidity does. Determinants of severe disease have been established to some extent in that infants under a year, and particularly the pre-term baby are the most vulnerable. Further details can be found in Table I.

### Pathology

The vast majority of upper ARIs are viral in nature resulting in a mucosal inflammatory response. A varying degree of viraemia will give rise to systemic symptoms and signs. A non-specific superimposed bacterial infection is common, mild and self-limiting. The natural course of the acute phase of the illness is 5-7 days.

Viral invasion of the lower airways, particularly of the bronchioles, will cause predominantly expiratory obstruction and distal accumulation of secretions. Damage to the deeper structures of the smaller bronchi may be more than transient with subsequent bronchiectasis. Primary viral or secondary bacterial pneumonia may accompany viral infection of the airways. The pathology of these is well described in standard textbooks.

### Clinical Features

The features of an upper ARI are too well known to be enumerated here. It is pertinent, however, to highlight those signs which suggest lower

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Table I. Epidemiological Factors Determining Severity of ARI

Host	Agent	Environment
Infant	Strep pneumoniae	Crowding
Preterm	H influenzae	Poor health care facilities
Unvaccinated	Mycoplasma	Poor maternal education
Not breastfed	Resp syncytial virus	Smoke
Congenital anomaly	Adenovirus	Cold weather
Malnourished	Para-influenza virus	

respiratory infection - eg pneumonia and bronchiolitis. The most important sign - and regrettably the most neglected - is tachypnoea. Respiratory rate > 50/min in infants and young children and > 60/min in the newborn is strongly suggestive of lower ARI. An axillary temperature  $\geq 38,5^{\circ}\text{C}$  in conjunction with tachypnoea is further confirmatory evidence. Inter- and subcostal as well as supra clavicular and suprasternal recession are similarly indicative of lung pathology but are less easily detected, particularly in the obese infant. Refusal of feeds suggest more serious disease whereas restlessness or drowsiness are features of respiratory failure.

Case Management

A few imperatives may be indicated at this point:

- (1) Antimicrobial drugs *do not* prevent secondary bacterial infection of a viral ARI.
- (2) Cough mixtures rarely have more than a placebo effect and may be harmful. In the short term there is no effective expectorant. Most cough mixtures contain antihistamines which dry

secretions, making expectoration more difficult, and cause drowsiness.

The *incidence* of ARI does not vary from one community to the other, but the *morbidity* does

- (3) Supportive therapy is essential eg
  - cleaning the nasal passages in small infants
  - antipyretics where indicated
  - adequate fluid intake
  - small frequent feeds, particularly also during convalescence
  - chest physiotherapy.
- (4) The severity of the infection must be determined and management adjusted accordingly. See Table II.

From the above it will be clear that the great majority of infants with ARI will do better without any medication. Should you fear that the parents will be dissatisfied with that management, the following suggestions may be helpful:

- Enquire as to the reason for the consultation. Underlying fears may be expressed which can be followed with appropriate enlightenment.

Table II. Management of the Child with ARI

Clinical Features	Recommended therapy
Cough and Coryza Temp < 38,5°C	Paracetamol for $\pm 2$ days Suppress cough if dry and painful
Cough & Tachypnoea $\pm$ Temp $\geq 38,5^{\circ}\text{C}$	Above Rx plus simple antimicrobial, eg cotrimoxazole
Cough & Tachypnoea $\pm$ Temp $\geq 38,5^{\circ}\text{C}$ + Recession + Refusal of feeds	Admission to hospital Sol penicillin 6 hrly iv or im or amoxicillin po or chloramphenicol po
Cough & Tachypnoea Refusal of feeds Drowsiness $\pm$ Cyanosis	Above therapy and high or intensive care.

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- Involve the parents in the management as far as possible by explaining the features of lower ARI. Furthermore parents must be aware of the natural history of ARI and of the need for a return visit should there be any deviation from this course.

### Notable Exceptions/Pitfalls

- (1) *Epiglottitis* - This affects children rather than infants and presents with rapidly progressive features of upper airway infection and

Globally:  $\frac{1}{3}$  of 15 million childhood deaths are due to pneumonia

obstruction. The child prefers to sit with the mouth open and not to swallow.

This is an emergency requiring tracheostomy and systemic chloramphenicol. Intensive care is essential.

- (2) *Croup* - (Laryngo-tracheo-bronchitis) presents with stridor - initially inspiratory - hoarseness and varying degrees of respiratory distress. It occurs in infants and young children and is due to a viral infection. The management is largely supportive but hospitalization is required for young infants and when there is respiratory distress.
- (3) *Foreign Body* - This diagnosis is regrettably missed not infrequently. The presenting features may suggest ARI but there is usually a history of

choking at the onset of the disease. Localized reduced air entry and/or localized wheezing should alert one to the problem.

- (4) *Bronchiolitis* - A common viral lower respiratory infection which presents in infancy and early childhood with cough, fever and wheezing. In the assessment, the features outlined in Table II apply. Symptomatic relief can be obtained by giving ipratropin bromide (Atrovent®) by aerosol with a spacer.

### The approach to the child with a chronic cough

(Chronic = > 3 weeks)

The following points in the history are helpful:

- Predominantly nocturnal and following exertion - suggests respiratory allergy - asthma.
- Progressively worse and paroxysmal in nature - suggests pertussis.
- Onset in early infancy with acute exacerbations - underlying lung pathology.

### The most important but most neglected sign is tachypnoea

The child with respiratory allergy/asthma often is physically well but has allergic rhinitis ("sinusitis"). Examination may reveal wheezing particularly following exertion. Response to  $\beta_2$  adrenergic drug (eg salbutamol) is almost diagnostic. Thorough evaluation and careful follow-up are essential.

Pertussis is often missed because of the atypical presentation - *ie* the absence of the whoop and relatively short cough paroxysm. Careful examination may reveal small sub-conjunctival haemorrhages or blood-streaked sputum. The full blood

Parents should understand the natural history of ARI, and be aware of any deviation from this course

count may show an absolute lymphocytosis. Whereas the majority of patients are diagnosed at a stage when antibiotics are of no value, it is important to ensure that all young infant contacts are given erythromycin prophylactically.

### Conclusion

The prevalence of ARI is similar in all population groups but the morbidity and mortality is high in disadvantaged communities and in young infants. The management of children with upper ARI should be in the hands of the parents as we, the medical practitioners, probably do more harm than good. The parents must be empowered to make the correct decisions with the knowledge of the features of lower ARI and of the natural history of ARI.

### References

1. Chretien J, et al. Acute Respiratory Infection in Childhood. *N Engl J Med* 1984; 310: 982-4.
2. Editorial. *Lancet* 1985 Sept 28; 699-701.