

# Nursing Management of Cholera Patients in Zambia



*Dorothy Chanda*

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Patients in Zambia**

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By  
Dorothy Chanda



**The University of Zambia**

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## FOREWORD

The University of Zambia School of Medicine works in collaboration with the Ministry of Health as the School's main stakeholder. The Ministry of Health labours on the provision of cost-effective quality health care as close as possible to the health care consumers. Hence this teaching book on the Nursing Management of Cholera patients has been written in response to the requirements of Basic Health Care Package. It seeks to build capacity of health care personnel in resuscitating and managing cholera patients in rural communities with inadequate health care personnel.

This book will be used at the different levels of health care provision. It has been written at an opportune time when the MoH, with the collaboration of the co-operating partners, have embarked on responding to the human resource needs of the country by introducing the Direct Entry Nurse Training Programme. Students will find this book very helpful as they will gain experience on resuscitating and managing cholera patients during their internship.

This book will guide all health care professionals on how to equip cholera centres and manage cholera patients during outbreaks. The book also provides the infection prevention component in the nursing management of cholera patients in different hospital units.

It is hoped that the skill acquired from this book will contribute to reducing the morbidity and mortality rates of cholera patients through timely and effective resuscitation.

The Ministry of Health hopes that more health intellectuals and professionals will embark on producing Health Learning Materials of this nature so as to help Zambia realise the Millennium Development Goals.

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## **PREFACE**

This book focuses on resuscitating the cholera patient in order to simplify health care provision in medically-disadvantaged rural health care settings. Its main purpose is knowledge transfer of the modalities of patient resuscitation in clinical practice.

### **Justification of Need**

This book is a landmark text for all nurse-educators who are involved in teaching student nurses in clinical areas. This knowledge-acquisition will help build the confidence of the students in clinical practice and thus raise the quality of health care provision.

The production of this book builds on the other existing pamphlets written on personal hygiene practices and maintenance of environmental sanitation and also describes the handling of cholera patients in various hospital units in order to prevent nosocomial infections.

All health care professionals are required to be very proficient in resuscitating dehydrated patients due to the public's higher expectations as a result of the cost sharing schemes that are now in place. The health care consumer now expects quality care for their money's worth. This book will guide the newly qualified health care practitioner to acquire the knowledge on choosing the right intravenous cannulae to use for resuscitating the dehydrated patient.

### **Target Groups**

The primary target group includes all the experienced health care personnel and clinicians who care for cholera patients in various health centres in the country.

The secondary target group are the nurse preceptors/clinical tutors, nurse-educators, Infection Prevention focal point persons, Infection Prevention liaison personnel who will be doing the knowledge transfer to students both in classrooms and clinical settings.

Basically, the book is on the resuscitation of the dehydrated cholera patient. It has four chapters. Chapter One deals with the origin and magnitude of cholera in Zambia which justifies its documentation to demonstrate the urgency of the target groups meeting the objectives of the book, the micro-organisms which cause cholera, its signs and symptoms and the modes of transmission.

Chapter Two deals with diagnosing cholera using the nursing process. It goes further to develop a Nursing Care Plan for the cholera patient. It lists the medical and nursing care items required in setting up of cholera units in affected areas.

Chapter Three discusses the prophylaxis and treatment of cholera patients and describes the signs and symptoms of cholera and the onset of dehydration and its progression. It also gives a guide to setting up of intravenous infusions in cholera patients as well as the rehydration therapy and subsequent feeding of cholera patients.

Chapter Four describes the policy and guidelines which guide the handling of cholera patients in various hospital units as well as the record keeping during cholera outbreaks.

It is hoped that the publication of this book will contribute to reducing morbidity and mortality rates due to cholera by implementing cholera preparedness modalities by District Health Management Boards long before the onset of the rainy season in Zambia.

**Dorothy Chanda**

**November, 2010**

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Special gratitude to Dr Shula-Malindi Chanda of Choma General Hospital for final editing of this book.

I am most grateful to our sons Mutale, Dr Shula-Malindi, Mboloma, and Mwamba who all continue to be my cheering corner.

To all of you I say 'thank you' from my inner-most heart and may the Almighty God continue to bless all of you.

I acknowledge all the help from my 'daughter' Mrs Majorie M. Mwangu, secretary in the Department of Public Health, School of Medicine for formatting this book.

## DEDICATION

To our first grand daughter, Savannah-Dorothy to whom I say 'we really love you very much indeed.'

To my late parents, Rev F. D. Osigwe and Lucy N. O. Osigwe.

To my loving husband, Prof. M.W. Chanda and children, Mutale, Dr Shula-Malindi, Mboloma and Mwamba.

To National Infection Prevention Working Group (NIPWG), and Safety Occupational Infection Prevention Committee (SOIP) membership who work tirelessly on Infection Prevention issues.

Lastly, but definitely not the least, to all the nurses who work tirelessly during cholera outbreaks.

## LIST OF ABBREVIATIONS

<b>CBoH</b>	-	Central Board of Health
<b>DHMB</b>	-	District Health Management Board
<b>EHT</b>	-	Environmental Health Technician
<b>HIA 1</b>	-	Health Information Aggregation Form 1
<b>HIQ 2</b>	-	Health Information Quality Assurance Form
<b>MoH</b>	-	Ministry of Health
<b>ND forms</b>	-	Notification of Disease Forms
<b>ND 1</b>	-	Notification of Disease Form 1
<b>ND 3</b>	-	Notification of Disease Form 3
<b>NHC</b>	-	Neighbourhood Health Committee
<b>NIPWG</b>	-	National Infection Prevention Working Group
<b>SOIPC</b>	-	Safety Occupational Infection Prevention Committee
<b>WHO</b>	-	World Health Organisation

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# CHAPTER ONE

## NURSING MANAGEMENT OF CHOLERA PATIENTS

### 1.0 Introduction

This chapter illustrates the magnitude of the cholera epidemic in Zambia. It describes the cholera disease, the micro-organism that causes it, the mode of spread, the signs and symptoms and the efforts that the Government of the Republic of Zambia makes towards its prevention and control.

### 1.1 Background Information

Cholera outbreak has always caused a high disease burden anywhere it occurs and Zambia is no exception. Tables 1 and 2 show the high morbidity and mortality rates due to cholera in the country. This documentation hopes to empower the health care personnel on cholera case management, especially, in the absence of a medical doctor in hardest-to-reach rural communities. It is hoped that this book will contribute to continued lowering of cholera morbidity and mortality rates in the future.

**TABLE 1: The Prevalence of the Cholera Epidemic**

<i>Years</i>	<i>Cumulative Admissions</i>	<i>Cumulative Deaths</i>	<i>Under Treatment as Per Indicated Year and Date</i>
1999	7 581	226	139
2006 as on 18/03/06	6 810	201	94
% decrease	10.1%	11.06%	32%

Source: MoH (2009).

There has been a decrease in the number of cumulative admissions, deaths and cases under treatment of 10.1 per cent, 11.06 per cent, and 32 per cent respectively between 1999 and 2006.

**TABLE 2: Zambia - Cholera Case Distribution from 10 September 2008 to 1 April 2009**

Province	District	Death	BIDs	Under Rx	Cum. Cholera	Cum. Discharge Cases (CFR)	Case Fatality Rate	Duration
Northern	Mpulungu	1	5	0	547	546	0.18%	19/10/2008 to 28/11/2008
	Kaputa	0	0	0	20	20	0.00%	06/11/2008 to 27/11/2008
	Mbala	2	0	0	28	26	7.14%	19/10/2008 to 28/11/2008
	Kasama	0	0	0	1	1	0.00%	7/02/2009 to 11/02/2009
Provincial Total		3	5	0	596	593	0.50%	30/09/2008 to 07/12/2008
	Chiengi	1	1	0	195	194	0.51%	10/09 to 03/12/2008 to 17/02 to 22/02/2009
Luapula	Nchelenge	5	0	2	333	326	1.50%	2609 to 21/11/2008 to 23/01 to 20/03/2009
	Samfya	1	0	4	10	5	10.00%	11/03/2009 to 22/03/2009
	Mwense	1	0	0	1	0	100.0%	30/01/2009 to 31/01/2009
		8	1	6	539	525	1.48%	10/09/2008 to 20/03/2009
Provincial Total		52	47	116	4500	433	21.16%	03/10/2008 to 01/04/2009
	Lusaka	0	0	0	12	12	0.00%	18/01/2009 to 20/02/2009
Lusaka	Luangwa	0	1	0	21	2	0.00%	25/01/2009 to 18/03/2009
	Chongwe	0	1	0	200	1	0.00%	10/01/2009 to 30/03/2009
	Kafue	0	1	2				

<b>Provincial Total</b>	52	49	118	4733	4563	1.10%	03/10/2008 to 01/04/2009
Southern							
Siavonga	2	1	0	143	141	1.40%	02/12/2008 to 20/03/2009
Livingstone	2	2	0	24	22	8.33%	06/12/2008 to 03/03/2009
Mazabuka	1	3	2	242	239	0.41%	09/12/2008 to 30/03/2009
Sinazongwe	0	1	1	203	202	0.00%	05/01/2009 to 30/03/2009
Itezihitezhi	0	0	1	1	0	0.00%	16/03/2009 to 20/03/2009
Kalomo	0	0	0	1	1	0.00%	02/02/2009 to 09/02/2009
Choma	0	1	0	23	23	0.00%	25/01/2009 to 25/02/2009
<b>Provincial Total</b>	5	8	4	637	628	0.78%	02/12/2008 to 30/03/2008
Central							
Chibombo	0	0	0	7	7	0.00%	07/01/2009 to 22/02/2009
Kabwe	1	2	5	255	249	0.39%	29/01/2009 to 01/04/2009
Kapiri Mposhi	0	0	0	10	10	0.00%	13/02/2009 to 19/03/2009
Serenje	0	0	0	24	24	0.00%	12/02/2009 to 19/03/2009
Mumbwa	4	1	0	111	107	3.60%	12/12/2008 to 12/03/2009
<b>Provincial Total</b>	5	3	5	407	397	1.23%	12/12/2008 to 01/04/2009
Copperbelt							
Ndola	0	0	0	34	34	0.00%	30/12/2008 16/01 to 03/03/2009
Masaiti	0	0	0	5	5	0.00%	Dates not yet provided
Kitwe	0	0	0	20	20	0.00%	23/01/2009 to 03/03/2009
Luanshya	1	0	0	1	0	100.0%	15/01/2009
<b>Provincial Total</b>	1	0	0	60	59	1.67%	30/12/2008, 16/01 to 03/03/2009
North-Western							
Solwezi	1	2	0	27	26	3.70%	14/12/2008, 16/01 to 09/02/2009
Eastern							
Niyimba	2	1	0	12	10	16.67%	20/01/2009 to 04/02/2009
Petauke	2	0	0	20	10	0.0%	20/02/2009 to 21/02/2009
<b>Provincial Total</b>	4	1	0	14	10	28.57%	20/01/2009 to 21/02/2009
<b>National Totals</b>	79	69	133	7013	6801	1.13%	10/09/2008 to 31/03/2009

The table shows that the country recorded a total of 7 013 cumulative cholera cases from 10 September 2008 to 01 April 2009. The number of deaths stands at 148 (2.1%) with a case fatality rate of 1.13 per cent while 133 patients were still receiving treatment. No updates here recorded from Western Province.

Despite a 2.9 per cent increase in magnitude in the number of cholera patients admitted during the cholera epidemics of 2005-6 and 2008-9, there was a 12.4 per cent decrease in the number of deaths due to cholera during the cholera epidemic period of 2005 - 6 and 2009.

Table 2 also shows a continued decrease (0.4%) in the cholera deaths during the 2005-6 cholera epidemic period, an average of 2.5 per cent magnitude compared to 2.1 per cent deaths that occurred during the cholera epidemic of 2008-9. This scenario shows that the MoH is doing a commendable job though more needs to be done to continue with the downward trend of cholera mortality, hence the need for this book to be written.

## Objectives

By the end of the chapter, the reader should be able to:

- Acquire knowledge on the background information on cholera, its origin, the magnitude of cholera and the periods when it occurs in Zambia.
- List the sero group and the biotypes of the micro-organism which causes cholera.
- Describe the signs and symptoms of cholera and how it can be spread and the factors that facilitate its spread.
- Describe the mechanisms put in place to control the disease in the country.

### 1.1.1 Origin of Cholera

Cholera was identified in 1905 in the East. The first cholera outbreak occurred in Celebes in 1937. Cholera has spread very widely and has affected about 98 countries since 1961 (WHO, 1991). In the same year (1961) the infection had spread to Indonesia, Philippines, Hong Kong, Malaysia, Burma, Thailand, India and the old Soviet Union. In 1970, it spread to the Middle East, the Mediterranean and Africa. Park (1997) states that the highest mortality and morbidity rates occur in Africa.

### 1.1.2 Cholera on the African soil

It is difficult to prevent cholera entering the country especially between neighboring countries. However, the spread can be controlled within the country by instituting appropriate infection prevention and control measures.

#### Zambia's Health Border Posts

Zambia shares borders with several other African countries as Table 3 illustrates.

**TABLE 3: Zambia International Health Border Posts and Diseases of Public Health Concern**

Province	District	Immigration/Border Post	Disease of Concern
Lusaka	Lusaka	Lusaka International Airport where all travellers from other countries are allowed to enter Zambia	SARS, Ebola Lassa fever
Copperbelt	Mufulira and	Mukambo border post between DRC, Kasumbalesa border town between Chililabombwe and DRC	Ebola, Dysentery
		Sakanya border post between Ndola and DRC	Dysentery Cholera and Ebola
Northern	Nakonde	Tunduma border post between Tanzania and Zambia.	Cholera, Yellow fever
	Mpulungu	Mpulungu Harbour border post between Zambia and Tanzania, Zambia and Rwanda, Zambia and Burundi, Zambia and DRC	Cholera
	Kaputa after Mporokoso	Kaputa border post between Zambia and DRC	Cholera

<b>Luapula</b>	Nchelenge	Nchelenge border post between Zambia and DRC	Cholera, Dysentery
	Chembe	Chembe border post between Zambia and DRC	Cholera and Ebola
<b>Western Province</b>	Kalabo	Kalabo Sikongo border post between Angola and Zambia	Polio
	Sesheke	Katimamulilo border post between Sesheke and Namibia	Polio
<b>Southern Province</b>	Siavonga	Kariba border post between Zambia and Zimbabwe	Schistosomiasis
	Livingstone	Victoria Falls border post between Zambia and Zimbabwe	Cholera, Dysentery
	Kazungula	Kazungula border post between Zambia and Botswana	Cholera and Polio
	Livingstone	Livingstone International Airport border and all countries.	SARS, H5N1, H1N1, Ebola, etc.
<b>North-Western Province</b>	Mwinilunga	Njimbe border post between Mwinilunga in Zambia and Angola	Cholera and Polio
		Chingi border post between Zambia and Angola	Cholera and Polio
	Mwinilunga	Kakoma border post between Zambia and Angola	Polio
	Solwezi	Mushindano border post between Zambia and DRC	Ebola
<b>Eastern Province</b>	Katete	Chanida border post between Zambia and Mozambique	HIV/AIDS
	Chipata	Chipata-Mwami border between Zambia and Malawi	Ebola

A cholera epidemic occurred in Malawi in 1989 and was contained in 1990. Before the Malawi epidemic, there occurred the first outbreak of cholera between 1978 -1979 in Zambia. MoH (1990) stated that the port of entry was the northern Border with Tanzania through Lake Tanganyika into Mbala District in the Northern Province (Appendix 1). Another port of entry was the Shaba Province in the Democratic Republic of Congo. Relatives who attended funerals in that country came back infected with the *Vibrio Cholerae* into Luapula Province, crossing Lake Nweru into Nchelenge District. In the 1980s, cholera had spread along the line of rail to Lusaka.

Lusaka had the first cholera outbreak in 1990. The Lusaka District Health Management Board (LDHMB) treated 553 cholera cases in the various treatment centres. The last major outbreak was in 1991-1992 with a case fatality of 25 per cent. In 1996, although there were more than 1 000 cases of cholera, the fatality rate was reduced to between 1-2 per cent.

It is worthy to note that Zambia was cholera-free for the year of 1997 as there were no cases reported. This may be attributed to the drought situation that Zambia experienced during this period. Table 4 shows that cholera occurs during the rainy season in Zambia.

**TABLE 4: Periods of Occurrence of the Cholera Epidemics between 1990 - 2008**

<i>Period</i>	<i>Year</i>
February - May	1990
December - March	1991
October - May	1992
November - April	1994
October - May	2008

Source: UTH Microbiology Laboratory (2008)

Table 4 shows that all the outbreaks occurred in the periods from October to May.

**TABLE 5: 1999 Confirmed Isolates of the 1999 Cholera Epidemic Outbreak**

<i>Confirmed Isolates</i>	<i>Total number</i>	<i>Percentage (%)</i>
V. Cholera 01 Ogawa	84	74
V. Cholera 01 ogawa +	02	1.7
Salmonella Typhimurium V. Cholera 01 Ogawa +Aeromonas Hydrophilia	01	0.8
Aeromonas Hydrophilia	03	2.7

Source: UTH Laboratory (1999)

The outbreaks are predominantly *Vibrio Cholerae* Ogawa serotype 01.

In 1998, Mpulungu, Mbala and Kasama in the Northern Province of Zambia, reported the first cholera cases. The disease quickly spread along the line of rail with Ndola in the Copperbelt Province of Zambia reporting its first case on 6 January 1998. The disease originated from the mother's shelter at a children's hospital. By the 10 January 1998, cholera had spread to Lusaka with the index case coming from Ndola. By mid-January 1998, of the same year, the cholera epidemic had spread to many parts of the country, affecting almost all the provinces apart from Western and North-Western provinces. It is possible that Western Province, apart from Kaoma, was free of cholera because of quick filtration of rain water into the sandy soils in that part of the country. The North-Western Province was spared from cholera epidemic possibly due to minimal movements of people from the cholera infected areas to the North-Western Province. By July 1999, the cumulative cases were 11 290 with a case fatality of 2.83 per cent.

## 1.2 What is Cholera?

Cholera is a highly infectious, acute diarrhoeal disease with sudden onset. It causes profuse rice-water diarrhoea and vomiting which leads to rapid dehydration.



### **What Micro-organism causes Cholera?**

Cholera is caused by the *Vibrio cholerae* micro-organism (World Health Forum, 1991). It is a gram negative bacilli which is shaped like a 'comma.' It is seen to move very fast under the microscope.

There are about sixty sero-groups of *Vibrio cholerae*. The organism that causes cholera is called *Vibrio Cholerae 0, group 1* or *Vibrio cholerae 01 sero group*.

### **01 Sero Group**

The 01 sero group can further be divided into two biotypes. These are called the classical biotype and the El Tor biotype. Each of these two groups can be divided further into three serotypes namely:

- The Ogawa
- The Inaba
- Hikojima

Both Ogawa and Inaba exist in Zambia.

The Ogawa serotype of the El Tor biotype is the type which causes cholera in Zambia. The El Tor group is more resistant than the classical *Vibrio cholerae*. It can live in shallow well water for about three weeks. It can also survive on raw vegetables for about seven days. It can also stay alive in milk and milk products for about one month while it can live in moist soil for some days. The *Vibrio cholerae* germs are not heat stable. They are killed at 56 °C within 30 minutes. However, the germs can live for up to six weeks or longer in disinfectants.

### **1.2.1 How is Cholera spread?**

Cholera spreads either directly or indirectly.

#### **1.2.1.1 Direct spread of Cholera**

Cholera can be spread from an infected person who is a carrier or from someone who is recovering from the disease. Anecdotal reports exist of mortuary workers or relatives that contracted the disease while attending to the dead body of their relative who died from cholera.

### ***A Case History***

*Nosocomial spread of cholera can occur when caretakers eat from the same plates as it happens in hospitals. Carriers of the cholera germs, who do not wash their hands properly after using the toilet and before eating together from same plates at funeral gatherings with their friends and relatives, can also spread the germs to them innocently.*

*There was an outbreak of cholera among mothers who were looking after their children in the paediatric wing of a large hospital in Zambia. These mothers became friends and started eating 'nshima and relish' from the same plates. Soon cholera broke out among these mothers at the mothers' shelter. The Infection Prevention Nurse, investigating this outbreak confirmed this outbreak as being a classical example of a hospital acquired infection. This scenario was used to conduct targeted health education on the prevention of cholera not only among these mothers but also during funeral gatherings.*

#### **1.2.1.2 Indirect spread of Cholera**

Indirect spread of Cholera can occur through the faecal-oral route which occurs when people drink infected water or eat infected food items. In infants, bottle-feeding could be a significant risk factor. Washing fruits in contaminated water is another source of infection.

### ***A Case History***

*The floors of Cholera Centres are disinfected with disinfectants. Some health care workers react to the smell of some of these disinfectants. Sneezing occurs and the covering of the mouth with the hands during sneezing often leads to accidental ingestion of the *Vibrio cholerae* hence causing a hospital acquired infection among carers.*

### **Uncontrolled Settlements**

Uncontrolled settlements are a health hazard because of poor environmental sanitation with haphazard refuse disposal in the absence of dust

bins, irregular refuse collection by the City Council due to lack of equipment and inadequate maintenance of the refuse-disposal vehicle. Cholera occurs in uncontrolled settlements due to improper citing of pit-latrines and the use of unprotected wells. Sometimes, pit-latrines are built on higher ground than the wells. This facilitates drainage of infected faecal matter into the unprotected wells. Porous soil encourages the seepage of faecal matter into the wells. In compounds with uncontrolled water sources, shallow wells are used for domestic needs. These compounds are bound to experience cholera outbreaks such as those which occurred in George, Chawama, Kanyama, Matero, Mandevu, Chipata and Garden compounds in Lusaka, Zambia (MoH, 1999).

Chanda (2004), states that some houses do not have toilet facilities, forcing the inhabitants to improvise with 'Shake Shake, Inzovu, Timwengi, Chat and Nkwazi locally-brewed used beer containers. These are thrown haphazardly in the community. Flies sit on them and transfer the faeces onto exposed food items thus causing diarrhoeal diseases, cholera inclusive. This mode of spreading germs is depicted by the five 'Fs' which stand for 'fingers, flies, food, faeces and formites.'

### **High Poverty Levels Lead to Poor Health Habits**

High poverty levels may lead to scavenging in refuse heaps especially by the mentally-unstable people. Also some people opt to wash their dishes in stagnant pools of water despite the rehabilitation and provision of safe tap-water. These people cite their inability to pay for the piped water supply. High poverty levels also lead to vandalism of these pipes. During the cholera epidemic, these challenges have to be overcome by the government's political will.

### 1.2.2 Pathophysiology of *Vibrio cholerae*

When a human being is infected with the *Vibrio cholerae*, the micro-organisms multiply in the lumen of the small intestine and produce entero-toxins which cause the profuse diarrhoea through its effect on the adenylate cyclase-cyclic Amp system of the mucosal cells (Park, 1997). The resulting watery diarrhoea causes an electrolyte imbalance if not corrected. Laboratory tests on cholera patients may show to have either low levels of potassium (hypokalaemia) or normal potassium levels. Potassium levels are normally 3.5-5.0 mmol/l. Mild hypokalaemia >2,5mmol/L but less than 3.5 mmol/L usually produces no symptoms. Severe hypokalaemia <2,5mmol/L produces dangerous symptoms. Hypokalaemia (Low potassium) can result in muscle cramps, muscle weakness, and severe cardiac arrhythmias and tetany. Therefore, Ringers Lactate must be used during the rehydration phase as opposed to normal saline. The composition of Ringers Lactate makes it ideal to correct electrolyte abnormalities resulting from dehydration.

Human beings have been documented as the only carriers of the *Vibrio cholerae*. The carriers make an important reservoir of the infection. In carrier state, the *Vibrio cholerae* is almost non-virulent. The carriers excrete very little of the cholera germs during non-epidemic periods. During epidemics, this non-virulent *Vibrio cholerae* converts to virulent type, hence the carrier becomes a source of the cholera germs. The infectivity occurs when an infected person excretes up to 10 to the power of 9. Infection only occurs when the infected person accidentally ingests this dose of organism per ml or exceeds the dose that is infective for the individual. A case of cholera remains infectious for a period of 4-7 days.

### 1.2.3 Epidemiology of Cholera

Cholera affects all age groups and both sexes. In 1992, Lusaka recorded the highest infected age group between 20-29 years followed by those up to 40 years of age. This may be due to the activities that these age groups are involved in. High morbidity rates also occur in children between the ages of 5 to 9 years as they are incapable of observing and practising personal hygiene measures in areas of poor environmental sanitation.

### 1.3 Signs and Symptoms of Cholera

These could be high temperature, passage of watery rice-stool and sudden vomiting.

- **Temperature**

Adults may not have high temperature while children, generally have temperature with cholera.

- **Watery rice-stool diarrhoea**

The patient passes a lot of painless watery diarrhoea. The stool does not smell. It presents as a whitish watery fluid. Sometimes, it has flecks of mucus in it. It is described as 'rice-water stool.'

- **Onset of sudden vomiting**

The patient develops vomiting suddenly which leads to dehydration, weakness, shock and collapse of the patient. Cholera needs national strategies for its prevention.

### 1.4 National Strategies for the Prevention and Control of Cholera

#### 1.4.1 Political will during Cholera Epidemics Disaster Management Unit of the Office of the Vice- President and the Ministry of Local Government and Housing

The government has set up the Ministry of Health (MoH), the Disaster Management and Mitigation Unit of the Office of the Vice-President and the Ministry of Local Government and Housing and other related ministries work together to prevent and control any emerging disasters and epidemics in the country.

They are also responsible for natural disasters like floods that displace people from their homes as well as diseases which reach epidemic proportions like cholera. The MoH demonstrates the positive political will of the government in controlling the cholera epidemic by formulating the health policies. The Directorate of Monitoring and Evaluation develops and implements an effective Health Management Information and Surveillance system at the various levels of the health care delivery system. During the cholera epidemics, each District Health Management Board is required to constitute an Epidemic Preparedness Committee.

#### **1.4.4 A Technical Committee**

The MoH also forms a Technical Committee which consists of a critical mass of experts from various health-related disciplines. This committee holds meetings with the Epidemic Preparedness Committee. The resolutions from these committees provide a platform for sharing and developing strategies of finding permanent ways of preventing and controlling the cholera epidemic. The Technical Committee develops and/or revises the existing case management protocols, control and preventive measures. The committee also mobilises both human and material resources at the national level.

A National Epidemic Preparedness Committee has now been formed from resolutions made at these meetings.

#### **1.4.5 National Cholera Task Force**

The MoH forms the Task Force which consists of an intersectoral, multidisciplinary committee. This high level committee is at policy and implementation level and the MoH chairs the meetings. Every year, the government shows its political will through its financial support. This committee provides the much-needed leadership, mobilises resources and ensures transparency in its handling of the epidemic.

#### **1.4.6 Cholera Command Posts**

The cholera command posts are established in strategic areas in Lusaka. The posts provide technical guidance at the national level. They serve as nerve centres for providing data and coordinating cholera logistics including case management and control strategies.

#### **1.4.7 Social and Resource Mobilisation**

It is very essential to mobilise resources and health personnel like medical doctors, clinical officers, environmental health technicians, pharmacists and nurses to man the cholera centres. Students are not left out as they all get mobilised to help out at the cholera centres.

Cholera kits are distributed to all districts. These kits help the districts to take immediate action in the preventive measures while waiting for further resources. The co-operating partners and NGOs also contribute in resource mobilisation in form of financial, time, material and personnel contributions.

The Neighbourhood Health Committee (NHC) in each compound should count the number of households in their compounds to facilitate targeted preventive measures. Any Non-governmental Organisation can donate gumboots for the field workers. The Environmental Health Technicians (EHT) are required to sample the sources of drinking water supply. The City Council can donate soap for hand washing, the Society for Family Health can donate some chlorine for the health care providers to conduct targeted health education and hand and vegetable washing demonstrations for each household.

#### 1.4.8 Summary of the Chapter

You now have an overview of the cholera epidemic and how it is handled in Zambia. Its magnitude has been illustrated. You have also learnt about the different groups of *Vibrio cholerae* in Zambia.

The chapter also discussed the signs, symptoms, mode of how it is spread and the reasons why this epidemic occurs in Zambia. It also has shown detailed mechanisms that the country puts in place to control cholera.

#### 1.4.9 An Exercise for Critical Thinking

A volunteer arrives in Lusaka during a cholera outbreak to study the epidemiology of the outbreak. You are assigned to brief him/her on the outbreak.

- (a) Discuss the history, the causes, signs and symptoms of cholera epidemic in Zambia with her/him.
- (b) Discuss the mechanisms that the country adopts to control cholera outbreaks.

## CHAPTER TWO

### DIAGNOSING CHOLERA

#### 2.0 Introduction

Chapter one discussed the handling of the cholera epidemic in Zambia, the causative organism and the serotype which causes the disease, its signs, symptoms and how it can be spread.

Chapter 2 discusses its clinical features, how it can be diagnosed in health care settings and the community in the absence of laboratory facilities. It emphasises on the procedure of taking, storing and transporting the rectal swabs to health care institutions with laboratories.

Previous prophylactic and curative treatments are outlined for both paediatric and adult patients. It also describes the nursing process and its application to the nursing management of a cholera patient. It further explains how an experienced nurse can tell when a patient progresses from no dehydration to severe dehydration and shock. The chapter emphasises the rehydration regime using the appropriate intravenous cannulae. It gives the health care provider/nurse a list of the requirements needed to set up a cholera unit.

#### 2.1 Objectives of the Chapter

At the end of the chapter the reader is expected to:

- Identify the clinical features of cholera.
- Use the nursing process in the nursing care of the cholera patient.
- Set up a cholera unit during an epidemic.

#### 2.2 The Clinical Features of Cholera (refer to the signs and symptoms of cholera)

The clinical presentation of cholera depends on the degree of dehydration suffered as a result of diarrhoea and vomiting. Handa (2011) describes the stages in a clinical case of cholera. These are the stages of no dehydration, some dehydration, severe dehydration, shock and stage of recovery.

##### (i) No dehydration

This stage starts rather abruptly with profuse, painless watery diarrhoea followed by vomiting. The patient may pass many stools in a day. The patient suffers excessive thirst.



Potentially the patient could lose less than 5 per cent of the body weight through diarrhoea and vomiting. The patient may progress to experiencing some dehydration.

**(ii) Some Dehydration**

During this stage of dehydration, the patient may lose 5-8 per cent of his/her body weight through diarrhoea and vomiting evidenced by dry mucus membranes. Clinically, the patient will have postural hypotension, tachycardia, weakness and fatigue. This stage may lead to severe dehydration if the patient is not attended to medically.

**(iii) Severe Dehydration**

This stage is due to severe loss of body fluids and electrolytes from diarrhoea and vomiting. Clinically the patient will have rapid feeble pulse, sunken eyes, hollow cheeks, sub-normal temperature and loss of skin turgor (elasticity). The urine output may decrease and may ultimately stop. This occurs when a patient loses more than 10 per cent of his/her body weight. With adequate fluid management the patient may recover.

**(iv) Shock**

This stage has all the signs of severe dehydration along with absent pulses, The patient may go into a state of hypovolaemic shock with low blood pressure, and anuria (no urine output).

**(iv) Stage of Recovery**

Adequate and timely fluid management leads to the recovery of blood pressure, temperature and urine output. This is shown by the blood pressure which begins to rise, the temperature returns to normal and the urine secretion becomes re-established. Severe cases only occurs in 5-10 per cent of the cases.

## **2.3 Clinical Diagnosis of Cholera using the Nursing Process**

### **2.3.1 Origin of the Nursing Process**

Florence Nightingale, the first nurse theorist, actually applied the nursing process during her work in the Crimea as she cared for the wounded soldiers in their deplorable environment.

Wilkinson (2007) noted that Hall (1955) was the first nurse to describe nursing as a 'process'. She noted that Johnson (1959) Orlando (1961) and Wiedenbach (1963) were among the first people to use the term 'nursing process'. One of the nursing theorists called Ida Jean Orlando developed the formal nursing process in 1950. In 1973, the American Nurses, Association developed standards for evaluating the quality of care that nurses render to patients. The publication of the America Nurses Association (ANA) standards encouraged the majority of the states in America to revise their Nurse Practice Acts to include 'assessments, diagnosis, planning, implementation and evaluation as legitimate features of the nursing role' (Wilkinson, 2007).

In rural settings where there is no doctor, it is imperative that the health care provider should carry out a quick assessment in order to diagnose the patient clinically. Health care professionals cannot render appropriate nursing care to the cholera patient without first carrying out a quick but thorough assessment on the patient.

### **2.3.2 Definition of the Nursing Process**

The Nursing Process is a systematic, problem-solving approach used to identify, prevent, and treat actual or potential health problems, to identify patients' strengths and to promote wellness. It provides the framework in which nurses use their knowledge and skills to express human caring (Wilkinson, 2007).

It involves assessment of a patient, planning, implementation, and evaluation. The nursing process will help the nurse to identify and document the clinical features in the cholera patient.

### 2.3.2.1 Nursing Assessment

During the nursing assessment, the health care provider collects data deliberately and systematically (Potter and Perry, 2006). Data is collected in order to ascertain the present and past health status of the patient. It also helps the health care provider to determine the coping ability of the cholera patient.

During the nursing assessment, the nurse collects data from the patient herself/himself as a primary source if the patient is able to provide this data or from the secondary source of data who may include the significant others, health professionals or from the medical records. This is followed by the nurse analysing the data in order to come up with a nursing diagnosis and also develop a nursing care plan for the cholera patient.

The nursing assessment helps the health care provider to create a data base which contains the findings on the patient's health problems and needs. The nurse should also collect information on the patient's previous encounter with health institutions, his/her health-seeking behaviour and personal hygiene practices which could have exposed him/her to acquiring cholera.

All information collected must be relevant to the disease of cholera (Potter and Perry, 2006). During data collection, the health care provider is expected to apply the principles of critical thinking which is 'the active, organised cognitive process used to critically examine one's thinking' (Potter and Perry, 2006). Critical thinking helps the nurse to make cogent and relevant decisions regarding the cholera patient's health care needs and the presenting condition.

While collecting the data, the nurse synthesises her knowledge gained from physiological, biomedical, environmental health sciences,

biological and social sciences in order to arrive at a correct clinical diagnosis.

During nursing assessment, the health care provider should develop a good interpersonal relationship with the patient and the significant others. She/he is expected to exhibit good attitudes and understanding of the patient's social status.

The findings from the nursing assessment forms the basis of arriving at provisional diagnosis. It precedes the scientific diagnosis. The nursing assessment consists of two components which are the history taking which forms the subjective data while the physical examination forms the objective data.

#### **2.3.2.2 Data Collection:** (*This includes the following*);

##### *(i) History taking*

- Find out the onset and the duration of the diarrhoea, the colour and consistency of the stool, vomiting, presence of fever (in children), muscle cramps etc.
- History of contact with anyone suffering from cholera, Patient's ability to maintain activities of daily living.

##### *(ii) Physical Examination*

The role of the physical examination is to direct the health care provider to identify the patient's actual or potential health problems and thus arrive at a nursing diagnosis. This should include, most importantly, observing the colour of the stool which should be rice-water.

The nursing diagnosis will help the nurse to initiate the rehydration of the patient. The physical examination is usually done systematically from head to toe in order to arrive at the level of dehydration in the cholera patient.

*(ii) Dehydration in the Cholera Patient*

The health care provider/nurse must be quick to detect the signs of dehydration in the cholera patient because dehydration kills cholera patients very quickly and because of the speed with which dehydration occurs in these patients, it is important for the health care provider to check carefully for the following signs and symptoms:

- Sunken eyes, dry mouth.
- Level of dehydration e.g, skin turgor.
- Muscle cramps in the arms and legs.
- Thirst which drives the patient to ask for a drink of water.
- The patient looks tired, anxious and very sick.
- Elevated temperature (in children, 38- 40° C).

The above signs and symptoms are danger signs which indicate that the patient is going into severe dehydration. The health care provider is required to act very quickly to rehydrate the patient.

**The Severely Dehydrated Cholera Patient**

The patient looks very weak, dehydrated and may go into a state of shock.

**The General Signs of shock in a Severely Dehydrated Patient are the following:**

- The eyes and cheeks sink in.
- The skin becomes cold, clammy, inelastic and pale, absent or very feeble pulse and hypotension.
- The patient loses her/his voice.
- The patient becomes anxious and restless but the patient remains conscious.

**2.3.2.3 Nursing Diagnosis**

Monahan *et al* (2007)., states that the nursing diagnosis forms the second component of the

nursing process. It forms the nurse's independent practice compared to dependent practice which is driven by the medical doctors. During the nursing diagnosis, the nurse is expected to identify the actual and potential health problems of the client. It involves analysing the data collected from the nursing assessment in order to come up with the nursing diagnosis. In relation to the cholera patient, the doctor may diagnose the medical condition of cholera while the nurse may come up with the nursing diagnosis that the patient is at risk of developing fluid volume deficit. This shows that the medical diagnosis focuses on the condition while nursing diagnosis focuses on the problems the patient experiences due to the medical condition. Therefore, the nursing diagnosis provides the basis for choosing the type of nursing interventions to be carried out on the patient.

Immediately the patient arrives at the treatment centre, the health care provider/nurse should carry out a quick physical assessment on the patient in order to identify the actual and potential health problems and thus arrive at a nursing diagnosis based on the observations made during the nursing assessment.

An actual nursing diagnosis should have three components i.e., the problem, the cause and the evidence. For example, fluid volume deficit related to passage of loose watery stools in the cholera patient is evidenced by the loss of skin turgor. A potential nursing diagnosis should have two components i.e., the potential problem and cause. e.g., risk for fluid volume deficit related to the passage of loose watery stool. In relation to the cholera disease, the patient usually arrives critically ill. So the nurse now needs to develop a nursing care plan.

#### **2.3.2.4 Developing a Nursing Care Plan and Setting Goals**

The nurse needs to develop the plan of care as well as set the goals or objectives which are the expected outcome that the nurse hopes to achieve based on her nursing care plan. The plan of action will outline the strategies which will state the present condition of the cholera patient, the expected outcome and the nursing interventions to be used to achieve this expected outcome in the patient. The nurse needs to identify the danger signs, and prioritise them in order to intervene to save the life of the cholera patient. If the patient is able to talk, the nurse should involve the patient while setting the goals to be achieved. The goals to be arrived at should be classified into long and short term goals. In relation to the nursing care management of the cholera patient, the short term goals should be attained within the shortest possible time in order to save the life of this patient. Using Dorothy Orem's model of care, the nurse should involve the significant others in order to achieve the long term goals. This nursing care plan has five columns which consists of the columns for the problem(s) identified, nursing diagnosis, planning and goal setting/objectives, implementation/intervention and the evaluation.

#### **2.3.2.5 Nursing Interventions in Relation to the Cholera Patient**

Potter and Perry (2006) define nurse-initiated interventions as the independent response of the nurse to the client's health care needs and nursing diagnosis. A nurse is able to act within his/her own scope of practice to intervene on a client's behalf.

In relation to the nursing management of cholera patients, the author defines nursing intervention as 'any treatment and application of nursing procedures that a nurse performs on the

cholera patient using his/her clinical judgment, critical thinking knowledge and previous experience on other cholera patients that results in the expected patient's outcome.' Nursing interventions describe the methods by which the set goals will be achieved like taking the rectal swab for culture and sensitivity in the laboratory to confirm the diagnosis of cholera. In relation to the cholera patient, these nursing interventions involve carrying out the specific, individualised nursing interventions to save the life of the patient. There are three areas to monitor during the nursing intervention. These are the vital signs:

#### *The Pulse Rate*

The first vital sign to monitor is the pulse rate. The radial pulse becomes weak and feeble. The pulse rate acts as a guide during the rehydration therapy. When the pulse rate is greater than 80 beats/minute, this alerts the health care provider that the patient may go into shock. The risk starts especially when the pulse rate is greater than 100 beats/minute.

The rising pulse rate is a compensatory mechanism that the body uses to improve the blood circulation to the vital organs of the body.

#### *The Blood Pressure*

This is the second vital sign to monitor. The health care provider should know that the pulse rate increases before the blood pressure falls. When the blood pressure falls it indicates that the patient's circulatory system has lost a lot of fluid. The patient may go into a state of shock and the temperature falls below normal.

#### *The Urine Output*

This is the third vital sign to monitor. The urine output decreases and anuria may develop. If anuria persists, the patient may die from renal failure. If this severe dehydration is allowed to



continue, the diarrhoea and vomiting may decrease. This usually heralds the onset of circulatory failure that may result in death. The signs of shock alert the nurse to set up an intravenous infusion on the patient in order to rehydrate the patient.

It is worthy to mention that the nurse should continue to evaluate the effectiveness of all the nursing interventions. As the condition of the patient improves, the nurse may assist in feeding the patient until the patient gathers enough strength and will power to do so according to Dorothy Orem's model of care. The nurse should also be competent in putting up the intravenous infusion to rehydrate the patient as well as inserting the urinary drainage catheter and monitoring the urinary output. As the patient recovers there will be the need to educate the relatives regarding personal hygiene practices and maintenance of proper environmental sanitation.

### **2.3.2.6 Evaluation**

Potter and Perry (2006) state that evaluation forms 'the final step of the nursing process'. They state that evaluation is crucial to determine whether, after application of the nursing process, the client's condition improves. The nurse applies all that is known about a client and the client's condition as well as experience with previous clients, to evaluate whether nursing care was effective and so determine if expected outcomes are met'. Evaluation determines the extent to which the chosen interventions have been successful in alleviating the patient's problems. Evaluation is a continuous process so finally the health care provider evaluates the condition of the patient.

During the evaluation, the nurse goes back to the assessment and compares it with the set goals to see if they have been achieved. The evaluation will show how the cholera patient has responded to the nursing interventions. It also provides the evidence and the accountability for the nursing care interventions.

During evaluation, the nurse should note whether sufficient assessment data has been obtained to formulate the nursing diagnosis, in turn nursing diagnoses should be evaluated for accuracy and expected outcome. The nursing diagnoses should also be evaluated to see whether they are realistic and achievable. Evaluation helps to determine whether the plan should be maintained, modified, totally revised or discontinued in light of the patient's health status.

**TABLE 6: Nursing Care Plan of a Cholera Patient**

<i>Nursing problem(s) identified</i>	<i>Nursing diagnosis</i>	<i>Goal/objectives</i>	<i>Nursing Interventions</i>	<i>Evaluation</i>
Dehydration	Dehydration due to diarrhoea and vomiting evidenced by sunken eyes, loss of skin turgor, dry mucous membranes, listlessness and weakness.	To rehydrate the patient within the next five hours.	<ul style="list-style-type: none"> <li>- Intravenous Therapy fluid management and monitoring,</li> <li>- Assess the fluid and electrolyte status during each shift. The patient is at risk of Hypovolaemic shock and may lose about 5- 8 litres of fluid through diarrhoea and vomiting.</li> <li>- Maintain strict and accurate in-take and output chart during each shift. Base fluid replacement on the amount of fluid losses.</li> <li>-Assess skin turgor and the status of the mucus membranes of the mouth during each shift.</li> </ul>	Patient is rehydrated evidenced by the patient producing normal stools and experiencing no vomiting, regularised pulse rate, blood pressure and increased urinary output.

			<ul style="list-style-type: none"> <li>- Maintain the IV fluids at the prescribed rate and flow in order to prevent fluid losses, dehydration and the onset of hypovolaemic shock.</li> <li>- Feel the patient's pulse rate before starting the intravenous infusion. If more than 80/ minute, allow the first litre of the infusion to run within 15 - 20 minutes. Allow the second litre to run within the next 30 minutes.</li> <li>- Run two litres of the Ringer's lactate. simultaneously in severely shocked patients.</li> <li>-Monitor the vital signs half-hourly.</li> <li>- Evaluate the colour of stool and its composition</li> <li>-Administer prescribed antibiotics (Ciprobid 1 tablet, twice daily).</li> <li>-Alternate Ringer's lactate with dextrose/Darrow's at 70 mls/kg body weight for the next five hours.</li> <li>-Put 5% Dextrose or 0.9% normal saline for maintenance dose or to keep the vein open.</li> </ul>	
Muscle cramps	Muscle cramps due to electrolyte imbalance evidenced by generalised acute pains related to loss of potassium and sodium from vomiting.	To relieve pain within 5 hours of intervention	<ul style="list-style-type: none"> <li>-Monitor for hypokalaemia (loss of potassium). Continue infusion with Ringer's Lactate</li> <li>- Monitor temperature, pulse and respiration 4 hourly.</li> <li>-Assist patient in performing activities of daily living such as bathing, oral hygiene, and grooming.</li> </ul>	Muscle cramps relieved within 5 hours of nursing interventions.

Imbalanced nutrition	Imbalanced nutrition due to omission of meals evidenced by the smell of acetone in the breath.	To commence patient on normal feeding in-order to prevent acidosis within 3 days of admission.	-Commence feeding the patient with normal diet when the vomiting stops. -Advise mothers to continue breast feeding infants and young children.	Acidosis corrected as patient stopped vomiting and is able to drink oral fluids and tolerated normal foods and became alert.
Lack of will power and energy to carry out activities of living	Lack of will power and energy to carry out activities of daily living evidenced by listlessness and weakness.	To enable patient gain will power loss of energy and independence in performing activities of daily living within 4 days as an in-patient.	-Administer 20 mls of 50% Dextrose intravenously through the cannula. -Continue to assist patient in performing activities of daily living such as bathing, oral hygiene, and grooming. -Counsel the patient on regaining will power. -Offer small frequent feedings as the patient can tolerate.	Patient regained will power evidenced by request to drink and feed self. Patient is able to perform activities of daily living such as bathing, maintaining oral hygiene and grooming self within 4 days of hospitalisation.
Fear of death	Fear of death related to the disease process evidenced by patient asking about his chances of survival.	To allay patient's fear of death within 24 hours of admission.	-Allay patient's fear of death from cholera. - Explain the role of the rehydration therapy to save lives to the patient within the treatment centre and to the family waiting outside the treatment centre.	Patient's fear of death allayed evidenced by patient remaining calm cool and collected and asking less questions.
Risk of loss of skin integrity	Loss of skin integrity due to patient developing pressure sores on the buttocks.	To prevent the patient from developing pressure sores on the buttocks within 3 days of admission.	-Promote blood circulation by massaging the skin on the buttocks 4 hourly. - Change the patient's position 2 hourly to relieve pressure on the patient's buttocks.	Patient's skin integrity maintained while on admission.

Potential to develop pulmonary embolism	Potential for pulmonary embolism related to the detachment of a thrombus, dehydration while the patient was immobile in the cholera bed.	To prevent the occurrence of pulmonary embolism while the patient is admitted in the hospital.	-Carry out passive exercise regime on the patient when immobile. Rehydrate patient parenterally and orally as soon as vomiting stops.	Passive exercises carried out. Patient's physical mobility regained evidenced by patient being mobile during convalescence period.
Potential of becoming a carrier of the <i>Vibrio cholerae</i> micro-organism	Potential to be a source of spread of the micro-organism after discharge from the hospital and for future cholera outbreaks	To prevent patient from becoming a carrier of the <i>Vibrio cholerae</i> micro-organism	-Advise patient to adhere to antibiotic regimen and finish prescribed antibiotic medication. -Advise patient to attend the clinic nearest his/her home for review and final discharge -Advise patient to insist for repeat collection of stool specimen for culture. - Health-educate client, family and the community on the importance of maintaining good personal hygiene practices and proper environmental sanitation for the prevention of future outbreaks.	Patient is in perfect good health evidenced by non-detection of the <i>Vibrio-cholerae</i> micro-organisms in his stool specimen.

### 2.3.3 Confirmatory Diagnosis

The confirmatory diagnosis requires the examination of the stool specimen in the laboratory. The stool specimen is obtained by taking a rectal swab. This is usually done by the nurse. Usually, at the beginning of any cholera epidemic, it is common practice for the District Health

Management Board to identify the causative micro-organism and establish the antibiotic sensitivity pattern. The stool specimen is taken before starting the antibiotic therapy.

### 2.3.3.1 Procedure for taking the Rectal Swab

- The nurse washes her hands and puts on his/her personal protective equipment.
- Explain what you are going to do to the patient
- Lie the patient on the side.
- Make the patient comfortable.
- With gloved hands, part the buttocks between the thumb and the first finger.
- Dip the sterile mounted swab in peptone water.
- Insert the sterile mounted swab into the rectum.
- Gently rotate it and withdraw.
- Put the swab in the transport media and close tightly.
- Send as quickly as possible to the laboratory within two hours in areas where there are laboratory facilities.
- The rectal swabs/stool specimen can be preserved in Cary-Blair transport media if the swabs cannot be worked on within two hours.
- In the absence of the transport media, the stool specimen/rectal swabs can be kept in a refrigerator at 4 °C. Transfer to the laboratory as soon as possible.

The result from the laboratory is a very essential guide for the confirmation of the epidemic and the treatment of the cholera patients as the Microbiology Laboratory identifies the causative micro-organism. Usually, the nurse is now required to mobilise resources for an effective management of the cholera patients when this diagnosis is made. Once an epidemic has been confirmed, not all patients need laboratory confirmation.

## **2.4 Requirements for an Effective Management of Cholera Patients in the Treatment or Transit Centres**

The treatment centres should be equipped with essential nursing and medical care items before effecting appropriate treatment.

### **2.4.1 Protective Clothing for Nursing Care of the Patients**

#### *Protective Clothing*

- Cotton aprons to be worn over the uniform dress
- Over-gowns
- Plastic aprons
- Face masks
- Boots
- Latex gloves
- Heavy duty elbow-length gloves

### **2.4.2 Medical and Nursing Care Items for the Patients**

- Cholera cots
- Wide basins to be put under the cholera cots
- Plastic sheets for the cholera cots
- Old clean linen

### **2.4.3 Items Required for Cleaning the Floors**

- Mops
- Teepol
- Bucket for the mops

### **2.4.4 Items required for Infection Prevention at the Cholera Centres**

- Disinfectants containing chlorine
- Disinfectants containing phenol like pyenol
- Pyenol has three active ingredients namely phenol, 4 chloro-2- phenylmethyl and potassium salt
- Antiseptic solutions like savlon which contains cetrimide
- Sprayers
- Hand washing soap
- Liquid detergents like teepol

### **2.4.5 Oral Therapy**

- Oral rehydration solution packets

- Antibiotics of choice
- Analgesics
- Antipyretics

#### **2.4.6 Items required for Intravenous Infusions**

- Intravenous giving sets
- 14 G 22 G intravenous cannulae
- Elastoplasts

#### **2.4.7 Intravenous Infusions**

- Ringer's lactate/Hartman's solution
- 50% dextrose for intravenous injection
- 5% dextrose
- 0.9% Normal saline
- 2.5% dextrose (150 mls)
- Dextrose /Darrow's

#### **2.4.8 Items required for Intramuscular Injections**

- 21 G needles
- 23 G needles
- 20 ml syringes
- 10 ml syringes
- 5 ml syringes
- 2 ml syringes
- Sterile water
- Spirit
- Cotton wool swabs
- Antibiotics of choice for the current epidemic

#### **2.4.9 Items required for the Last Offices**

- Shrouds
- Cadaver bags
- Cotton wool
- Bandages
- Sinus forceps

### **2.5 Summary of the Chapter**

This chapter has discussed how to diagnose the cholera patient clinically in areas where a laboratory does not exist as well as scientifically where a laboratory exists. It has also discussed how



to use the nursing process in the care of the cholera patient. The chapter has, also, listed the medical and nursing care items required for setting up of a cholera center which are used for the care of the cholera patients

## **2.6 An Exercise for Critical Thinking**

You are a community health nurse in George Compound where an outbreak of cholera has been reported. Patients have been brought into the make-shift cholera centre.

- (a) Describe the nursing assessment of a cholera patient.
- (b) Create a nursing care plan that would direct your nursing interventions.
- (c) Discuss how you would set up the unit using the available resources.
- (d) What would you do to ensure that a cholera epidemic really exists at George compound.

## CHAPTER THREE

### CASE MANAGEMENT OF CHOLERA PATIENTS

#### 3.0 Introduction

In the last chapter, the reader learnt how to set up a cholera unit and clinically diagnose a cholera patient. In this chapter, the reader is expected to be knowledgeable in managing the cholera patient. The reader is guided on how to identify the state of the veins and the use of the appropriate intravenous cannula for setting up an intravenous infusion in order to rehydrate the dehydrated patient.

#### 3.1 Objectives

By the end of the chapter, the reader is expected to:

- Acquire knowledge on the nursing management and treatment of patients suffering from cholera.
- Control the spread of cholera in communities effectively
- Recognise when a dehydrated patient progresses into shock.
- Be competent on how to rehydrate a severely dehydrated patient.

#### 3.2 Curative and Prophylactic Treatment of Cholera Patients

The laboratory analysis determines which appropriate antibiotic therapy to use during the current epidemic. The medical doctor or the clinical officer puts the cholera patients on the antibiotic that is sensitive to the *Vibrio-cholerae*. The nurse gives the prescribed antibiotics intramuscularly when there is vomiting. When vomiting stops within 3-4 hours after hydration, the antibiotics of choice is given orally (WHO, 1992).

During the cholera outbreaks the medical personnel should control and restrict the use of antibiotics to the patient with some dehydration and the severely dehydrated patients because the *Vibrio-cholerae* germs may become very easily resistant to the antibiotics if misused.

### 3.3 TABLE 7: Adult dose of Doxycycline, Ciprofloxacin and Mebendazole

Therapeutic	Prophylaxis
Doxycycline 200mgs start, 100mgs twice a day for 5 days For persistent diarrhoea, Ciprofloxacin 500mgs twice a day may be given 5-7 days. Mebendazole 3 tablets start may be given to patients vomiting worms or 100 mgs twice/day for 3 days. Furazolidine 100 mgs 4 times per day for 5 days.	300mgs stat only

Source: UTH Microbiology Report, 1999

- During the cholera epidemic in 1999, Doxycycline was the drug of choice. Doxycycline is a long-acting variety of tetracycline.
- Erythromycin or chloramphenicol may be used when the *Vibrio-cholerae* 01 is resistant to the above antibiotics
- Doxycycline is the antibiotic of choice for adults (except pregnant women).

#### 3.3.1 Advantages of Doxycycline over Tetracycline

Doxycycline remains the drug of choice in the treatment of cholera because it is given twice a day and it has a longer  $\frac{1}{2}$  life than tetracycline. Downie *et al.* (1995), describe the rate at which drugs are eliminated from the plasma as the drugs' half life ( $t\frac{1}{2}$ ). This is the time required for the concentration of the drug in the plasma to decrease to one-half of its initial value. This means that, at least, 50 per cent of the Doxycycline still remains available and active in the body 24 hours after it has been biodegraded in the liver.

Another advantage is that it is given orally and thus avoids all the dangers associated with giving an injection, for example, pain on being injected, abscess formation, nerve injury etc. Unfortunately, there is no updated sensitivity pattern for both Doxycycline and Tetracycline due to lack of resources in the Microbiology Laboratory.

### 3.4 Treatment of Cholera in Paediatrics

Ciprobid or ciprofloxacin 30ml per kg body weight per day divided 12 hourly for 3 days (this treatment should not exceed 2 gms/day. Note that Tetracycline and doxycycline may cause teeth discoloration in young children, so use ciprobid instead of doxycycline and tetracycline. Norfloxacin is contra indicated in children less than 18 years old. (www.medscape.com) accessed 19/06/2011.

**TABLE 8: Sensitivity Pattern of *Vibrio Cholerae* (01) inaba isolates from the 2009/2010 Cholera Epidemic**

AntiMicrobial agent	Susceptible %	Intermediate %	Resistant %
Ciprofloxacin	100 (51/51)	0 (0/51)	0 (0/51)
Cefotaxime	100 (51/51)	0 (0/51)	0 (0/51)
Ampicillin	100 (51/51)	0 (0/51)	0 (0/51)
Nalidixic acid	0 (0/42)	-	100 (42/42)
Chloramphenicol	0 (0/42)	73.8 (31/42)	45.2 (19/42)
Trimethoprim/ sulfamethoxazole	0 (0/42)	0 (0/42)	100 (42/42)
Furazolidine	0 (0/42)	-	100 (42/42)

Source: UTH Microbiology Report, (March 2010)

Enclosed in parenthesis, the numerator is the number of isolates sensitive or intermediate resistant or resistant respectively and the denominator is the total number of isolates tested at the University Teaching Hospital Microbiology Laboratory, Zambia.

### 3.5 Cholera Control Measures

Mwansa *et al.* (2006), note that 'the emergence of antibiotic resistance may significantly influence strategies for controlling cholera, continuous monitoring of epidemic strains is crucial.' Based on the above, it is mandatory that all health care providers take stool specimens early during any cholera outbreak and send them for laboratory analysis because 'effective cholera management depends on an updated culture and sensitivity results from the laboratory. These results help the laboratory scientists to decide on the antibiotic of choice to be used during any cholera epidemic as the antimicrobial sensitivity pattern may vary from region to region. Rafi *et al.* (2004), conclude that 'antimicrobial sensitivity varies from region to region and also

changes with time within the same region'. The scientists noted, in Rawalpindi which is the study location, that *Vibrio cholerae* 01 'El Tor' is predominant in Pakistan. They observed that the classical variety surfaced in 1999 and replaced the 'EL TOR' by 2001 when it re-emerged. They observed that the existing strains have become sensitive to Ampicillin and Tetracycline but have become completely resistant to Nalidixic acid while Erythromycin, Ofloxacin and Ciprofloxacin remain very effective in the treatment of the existing strain in Rawalpindi. In Zambia, during the current cholera epidemic of 2008-9, the antibiotic of choice is Erythromycin.

When ampicillin has to be used the dosage is 500mgs intravenously 4 times a day (qid). The dose for Tetracycline is 250-500 mgs orally 4 times a day (qid) for 5-7 days. The dose for Erythromycin is 500 mgs twice a day for 5 days and the dose for Nalidixic acid is 500 ml (qid) for 5-7 days

### **3.5.1 Prophylaxis Treatment in areas where Cholera is Endemic**

Mwansa (2009), in his lectures, states that the 'treatment of an entire community with antibiotics, referred to as mass chemoprophylaxis, has never succeeded in limiting the spread of cholera.' He further explained that there are a number of reasons for not recommending mass chemoprophylaxis during outbreaks of cholera. Some of the reasons are that the modalities involved in the distribution of the drugs to the entire community, are very cumbersome. It usually takes longer to organise distribution of the drug than for the infection to spread. Re-infection with the *Vibrio cholerae* micro-organisms may occur a day or two after the effect of the drug wears off. An entire population needs simultaneous treatment with the prophylaxis followed by isolation from the surrounding communities for the prophylactic treatment to take effect. Some people, in the community, who feel well and do not see themselves as being susceptible to cholera may refuse the prophylactic treatment as they continue to carry out healthy life styles according to their belief. He continues to state that the use of chemoprophylaxis may encourage people to ignore observing basic personal hygiene practices

and maintaining proper environmental sanitation. This non-chalant attitude may lead to the emergence of antibiotic resistance to the *Vibrio cholerae* depriving severely ill patients of valuable treatment. The health care providers should conduct health education messages targeting patients, visitors and the community through the mass and print media. The focus of the message should be that vaccination is not really necessary to protect oneself from acquiring cholera.

### 3.5.2 Quarantine/Travel and Trade Restrictions

'Quarantine' (40-day detention) is the term used to protect against the transportation of diseases like cholera. It originated in Europe during the 14th century. Travellers used to be detained for a forty-day period at health posts. It became obvious that these detentions at international airports and travel restrictions needed the identification of clinics where travellers could be detained and observed for onset of signs of the disease as well as the setting up of check-up posts within the countries to monitor, restrict and cordon off the movement of people.

It was hoped that the incubating diseases would surface during this period of detention. Despite all these efforts, the authorities noted that it was impossible to detect and quarantine all infected travellers especially the 'carriers' of the *Vibrio cholerae* germs who did not show any signs of illness. The travel and trade restrictions require that substantial human, financial and time resources be expended in order to ensure an effective cholera control measure. It was observed that different countries adopted different methods of quarantine internationally. This led to the failure of the quarantine procedures because there was no uniformity and order in its procedures between countries. It also failed because it inconvenienced trade and travel and thus affected the economies of countries. It was also noted that travel and trade restrictions between countries or different areas within a country did not prevent the spread of cholera as people always found clandestine routes for their travels and trades. Hence targeted health education messages to communities

remain key strategy in the control of cholera. There has to be a way to allow people who must travel to countries where cholera is endemic to continue to do so. This method was through vaccination of travellers.

### 3.5.3 Vaccination

The vaccine used to protect travellers from contracting cholera is a dead bacterial vaccine which is preserved with phenol. It includes the different strains of the the *Vibrio cholerae*.

#### Storage

It should be stored between 2°C - 6°C when it will remain potent for 18 -24 months. Once an ampoule has been opened, it should be used within one hour. The opened ampoules, which are kept outside the refridgerator will remain potent for 6-8 hours only and must be discarded after that time. Health care providers must not freeze the ampoule at any time.

#### Administration and Dosage

The primary vaccination course consists of two injections which should be given 1-2 weeks apart.

#### Adult Dose

The first dose for adults should be 0.5cc. stat, the second dose should be 1 cc. to be given 1.2 weeks after the first injection.

#### Children's Dose

The children should be given half the amount of the adult dose.

#### Children's First Dose

The first child's dose should be 0.25ml while the second dose should be 0.5ml.

Only one primary dose is necessary every six months to maintain adequate immunity and a valid certificate.

## Oral Cholera Immunisation

Health care professionals can administer cholera vaccine orally according to the latest medical technology. This includes the use of vial vaccine plus sachet effervescent granules. This vaccine also confers protection against enterotoxigenic *E. coli*.

### Adult dose (for one dose)

*Primary immunisation:* Two doses of the preparation to be given orally.

*Booster dose:* One dose to be given orally after two years.

### *Mode of preparation*

- Mix one packet of the effervescent granules with 150 ml water.
- Add one vaccine vial and mix thoroughly well.
- Administer doses at intervals of 1 - 6 weeks.
- Avoid food 1 hour before and after administration.

### Paediatric Dose

Do not administer to children under two years.

Primary immunisation for children 2 - 6 years old:

- Give 3 doses orally.
- Give one dose orally after 6 months.
- Administer doses at intervals of 1 - 6 weeks.

More than six years old:

- Same as adult dose.

[www.medscape.com](http://www.medscape.com) (accessed 24/06/2011)

### Indications

Health educationists have observed that vaccination gives a false sense of protection to people who have been vaccinated. They tend to ignore the maintenance of personal hygiene practices. It has been increasingly recognised that cholera vaccine is ineffective in the control during an outbreak or even in adequately protecting those people who have been vaccinated. Vaccination campaigns also divert resources and manpower from more useful control activities like mass targeted health education messages.



Because of the limitations of cholera vaccination, the 26<sup>th</sup> World Health Assembly (1973) abolished the requirement in the International Health Regulations for a certificate of vaccination against cholera. Some African countries like Tanzania, still require that people who travel to Tanzania get vaccinated against cholera. Local areas where there is an outbreak also do require the vaccination.

### **Duration of Immunity**

A cholera vaccination becomes internationally valid six days after the first dose or immediately after a booster dose is given before the end of the valid period. It remains valid for six months only

### **Contraindications**

Health care providers should not vaccinate people who are acutely ill or those who suffer from chronic heart, liver and kidney diseases.

### **Complications**

The reactions expected are local inflammation and some redness at the injection site and a slight fever for 24 hours. Give aspirin tablets to adults and paracetamol syrup to children with these complications.

## **3.6 A Guide to Setting up of Intravenous Infusion in Cholera Patients**

Due to the emergency state of the cholera patient, nurses need to acquire proficiency in setting up of intravenous infusions in cholera patients. The student needs to be able to identify the state of the veins i.e., be able to identify visible, partially visible or collapsed veins and the intravenous cannula to be inserted into the veins for rehydration purposes.

*It is worthy for the nurse to note that the smaller the number of the cannula, the larger its bore hole.*

### **3.6.1 Visible Veins**

This means that the vein is not collapsed and can be easily accessed. The best intravenous cannulae to use on visible veins are the 14 G. This cannula has a large lumen.

### **3.6.2 Partially Visible Veins**

When the veins are partially visible, the best cannula to use is the 16 G intravenous cannula.

### **3.6.3 Collapsed Veins**

Collapsed veins occur in adult cholera patients. These veins are difficult to access when putting up an intravenous drip. The best intravenous cannula to use for collapsed veins is the 18 G 20 G intravenous cannula.

The 22 G intravenous cannula can be used in bigger children or in accessing very collapsed veins in adults. As rehydration takes place, the cannula may be changed to a more appropriate one. The nurse is required to stay by the patient's bedside observing that the drip does not run through. The nurse is also required to observe the state of the veins as the patient rehydrates and change the intravenous cannula accordingly.

## **3.7 Rehydration Therapy in Cholera Patients**

### **3.7.1 Ringer's Lactate (Hartman's Solution)**

This is the intravenous solution most commonly used in rehydrating cholera patients. This intravenous infusion replaces the electrolytes that are lost in diarrhoea and vomiting. The nurse should feel the patient's pulse rate before starting the intravenous infusion. If the pulse rate is more than 80/minute, then the nurse should allow the first litre of the infusion to run within 15 - 20 minutes. The second litre of the infusion can run within the next 30 minutes. In severely shocked patients, two litres of the Ringer's lactate may need to run simultaneously. In addition, 20 mls of 50 per cent Dextrose is given intravenously through the cannula. This is usually given when there is acidosis.

Acidosis may present when the patient has not eaten for a long time. When a patient has acidosis, the breath may smell of acetone. Children may develop fast breathing. By the time the second litre of the Ringer's Lactate runs through, the patient comes round, the eyes become more alert and the patient may ask for food to eat or a drink of water. When the radial pulse is of good volume, the urine output increases and the vomiting ceases.

Oral rehydration solution (ORS) can be given orally now a little at a time. At this time, alternate Ringer's lactate with dextrose/Darrow's at 70 mls/kg body weight for the next five hours. five per cent Dextrose or 0.9 per cent normal saline can be put up for maintenance dose or to keep the vein open. As the patient is rehydrated, the frequency of diarrhoea and vomiting gradually decreases and eventually stops. The blood pressure returns to normal. The pulse rate regularises and the urinary output also returns to normal. The patient may now ask for food to eat, much to the joy of the medical team.

### **3.7.2 Feeding the Patient**

- Resume feeding the patient with normal diet when the vomiting stops.
- Continue breast feeding infants and young children.

### **3.8 Summary of the Chapter**

This chapter has dealt with how the health care provider can identify the state of the veins, the use of the appropriate intravenous cannula and the intravenous infusion for rehydrating the dehydrated cholera patient.

### **3.9 Exercise for Critical Thinking**

Discuss the treatment modalities of a cholera patient in a cholera unit that you are in charge of.

## CHAPTER FOUR

### POLICIES AND GUIDELINES FOR MANAGING THE CHOLERA PATIENT IN VARIOUS HOSPITAL UNITS

#### 4.0 Introduction

This chapter defines a cholera outbreak as an epidemic when there is an occurrence of even one confirmed case of a patient diagnosed with cholera disease/infection in the community or health institution.

The last chapter dealt with the management and resuscitation of the dehydrated patient in- order to save life. This chapter augments the last chapter by stating the national policy and guidelines which guide the practice and management of cholera patients. The maintenance of basic hygiene practices in the various hospital units is also illustrated. It also deals with record keeping and carrying out the last offices in the event of the demise of the cholera patient.

#### 4.1 Objective of the Chapter

By the end of the chapter, the reader should be able to:

- Prevent the transmission of the cholera disease/infection from the infected patients to staff and vice-versa as well as to the community members.
- Conduct surveillance during the cholera outbreak.
- Acquire knowledge of the policy guidelines in nursing cholera patients.
- Manage, prevent and control the spread of cholera in the different hospital units.
- Acquire knowledge on the processes of burying the dead cholera patient safely without further spread of the disease by observing infection prevention practices during the burial of the dead cholera patient.

##### 4.1.1 Activities/Measures

- The Infection Prevention and Control Committee of the health institution should ensure that the infection prevention guidelines are pasted on the notice boards for consultation by the health care practitioners.
- The Committee should ensure that all health care providers wear appropriate protective clothing to

protect them from acquiring cholera whilst carrying out their duties.

- Ensure the availability of a trained Surveillance Team to conduct household and health facility surveillance during the disease outbreak in the community.
- Ensure the availability of trained Infection Prevention and Control liaison personnel to conduct monitoring activities during the cholera outbreak in the health facility.
- The District Health Management Team is required to identify and designate Health Centres to be used as cholera treatment centres.
- The Health Facility In-Charge should keep a record of any nosocomial infections among health care providers supported by laboratory results and medical record review.
- Ensure the availability of notices which restrict visitors to the cholera centre.
- Ensure the availability of reports on patients admitted and discharged with confirmed cholera disease by reviewing their medical records.
- Ensure the availability of microscopy, culture and sensitivity stool results from the Microbiology Laboratory.
- Ensure the availability of health care personnel to nurse and treat the infected patients and their contacts in the community.
- Ensure the availability of the drug of choice for the treatment of both children and adults suffering from cholera for the current year.
- Ensure the availability of nursing and medical care items required for the nursing management of the cholera patients.

#### **4.2 National Policy during Cholera Epidemic**

The Infection Prevention Committee (IPC) in the health facility is required to declare that the cholera outbreak exists with just one occurrence of a confirmed cholera disease/infection in an in-patient or in the community.

The Ministry of Health is required to declare that a cholera outbreak exists by confirmed diagnosis, through the results of the microscopy, culture and sensitivity patterns, of the first stool specimen sent to the laboratory at the beginning of each cholera epidemic.

- Each Health Centre In-Charge should report the admission of even one single patient suspected or suffering from cholera to the District Health Management Team within twenty-four hours of admission of such a patient in a health facility.
- A trained surveillance team is to conduct surveillance regarding the disease /infection outbreak.  
Provide all medical and nursing care items required for the care and treatment of cholera patients.
- The Ministry of Health is to educate the public on health through the print and electronic media, on how to prevent cholera by observing simple personal hygiene practices and maintaining proper environmental sanitation.
- The Ministry of Health should enforce the use of the 'Anti-microbial Policy' by clinicians. Efforts shall be made to avoid the use of antibiotics for prophylaxis during cholera epidemic by all health personnel attending to the cholera patients. This is to avoid the emergence of drug resistance to the antibiotic of choice during the epidemic.
- The National Microbiology Laboratory at the University Teaching Hospital should identify the drug of choice to be used in the treatment of cholera at the beginning of a cholera epidemic each year. The antibiotic of choice shall be used for the treatment of patients suffering from cholera in order to shorten the duration of illness, reduce the bacillary load and prevent the spread of the disease.
- There shall be records of all patients admitted in all the cholera treatment centres in relation to descriptive epidemiology of person, place and time.
- The cholera centre supervisor shall write a report consisting of a tentative hypothesis which shall stipulate the best assumptions regarding the source and route of the cholera outbreak.

### 4.3 Hospital Policy

The policy of most health institutions stipulates that all cholera patients shall be nursed and treated in identified cholera centers set up by the District Health Management Boards.

#### 4.4 Guidelines at Health Care Institutions

The following are guidelines for the actions to be taken if a cholera patient arrives at the Filter Clinic of any hospital:

- Nurse the patient in the cholera centre observing transmission-based precautions as the patient arrives with diarrhoea and vomiting.
- Note the onset of the cholera infection, incubation period and its signs and symptoms.
- Note the susceptibility of the contact persons and the other population at risk of acquiring the cholera infection.
- The nurse should observe the stool and make a clinical diagnosis.
- Avoid the admission room or where there are a lot of patients.
- Transfer patient to the isolation unit for resuscitation.
- Take a rectal swab and send to the laboratory.
- Refer patient to see the doctor for prescription of the antibiotic of choice.
- Commence patient on the treatment.
- Observe the vital signs  $\frac{1}{4}$  hourly depending on the condition of the patient.
- Make patient comfortable.
- Phone for the ambulance to transfer patient to the treatment centre in their geolocation.
- Take patient's data for contact tracing
- Take patient's history and fill in the relevant forms for analysis.

##### 4.4.1 Care of the Patient at the Cholera Centre

The nurse is required to wear protective clothing all the time while nursing the patients. The carer should admit the patient in the usual manner and make her/him comfortable by covering the patient with blankets. Nurse the patient on cholera cots lined with plastic cover in order to preserve the cot for further use. The nurse should place wide basins with disinfectants under the cots. These basins receive the bowel motions. Immediately after use, pour the contents down a functioning toilet and flush. Wash and disinfect the basins before re-use. If in rural areas, pour contents down the pit latrine.

#### 4.4.2 Basic Hygiene Practices

The health care provider is to observe basic hygiene practices.

- Personal hygiene practices simply means maintaining personal cleanliness by washing hands after using the toilet. Washing any fruits before eating them. Covering left-over foods from flies and heating any left-over food before eating them. Insisting on buying hot food items from cooking places. Wash and dry hands properly before and after eating any food item.
- Wash hands with soap under running water in between patient care.

#### 4.4.3 Care of Dust Bins

Dispose of all paper and incontinent sheets in dust bins. Incinerate or burn contents when full and at the end of every shift.

#### 4.4.4 Care of Spillages

*In health institutions the health care providers have to deal with spillages of patients excretions, the more so while nursing the cholera patients due to the nature of the disease.*

These excretions may be bowel motions or vomitus and when this happens, the nurse should flood them with diluted kynol solution for  $\frac{1}{2}$  an hour. In rural areas, cover with ash or sand where kynol is unavailable. This prevents flies getting on them and later spreading the disease by alighting on food items. After  $\frac{1}{2}$  an hour, the health care provider collects the disinfected excretion and pours them down sewer drain if in health institutions or down a pit latrine in rural settings. Mop dry.



#### **4.4.5 Care of Floors**

The nurses are required to disinfect floors with diluted kynol hourly and mop dry. They should soak floor mats or condemned linen in diluted kynol. Place these soaked mats at the entrance to the cholera units. All health workers should step over these mats in order to clean the soles of their shoes before entering the unit.

#### **4.4.6 Care of Walls**

When necessary, disinfect the walls with diluted hypochlorite solution.

#### **4.4.7 Care of Bedstead and Furniture**

Clean and disinfect with hypochlorite solution

#### **4.4.8 Care of Linen**

Use condemned linen to be burnt later, thus cutting down on laundering infected linen.

#### **4.4.9 Care of Crockery**

Wash all used cups, plates spoons and forks in hot soapy water, rinse and dry on appropriate technology dish racks.

### **4.5 Use of Demographic Characteristics in Contact-Tracing**

Get the patient's data regarding the following: name known by in the community or neighbourhood, age, sex, address, recent visitors to the house since taken ill and where the visitor is coming from. The health care worker should note if the visitor is coming from a cholera-infected area. This information should be passed onto the Environmental Health Technician (EHT) for contact racing and targeted health education.

### **4.6 Visitors**

The nurses should not allow any visitors into the cholera unit. The visitors can watch their loved ones from windows identified for that purpose. The nurse should inform the patients of any of their visitors and pass on loving messages from them. This is very important in order to maintain the social support systems.

#### 4.7 Handling of Dead Bodies during the Cholera Epidemic

The health care providers should know that the body remains infective even after death until it is disinfected. When the patient dies, the Sister-in-Charge should inform the relatives. During cholera epidemics, it is the duty of the Environmental Health Officer to disinfect the body after certification. The nurse is required to carry out the last offices by doing the following:

- Plug all the orifices with cotton wool soaked in disinfectants.
- Soak the shroud in the disinfectant and wrap the body with it.
- Put the body in cadaver bags and tie securely.
- Take the body to a make-shift mortuary.
- The Environmental Health Officer supervises the burial.
- Give the attending relatives, who should not exceed five in number, four capsules of Tetracycline each start.
- The attending relatives are instructed to disinfect their clothing after the burial. The clothing should be boiled after the burial. The relatives are instructed to bath thoroughly with soap and water after the burial

#### 4.8 Cholera Patients in various Hospital Units

##### 4.8.1 The Theatres

###### *Guidelines for Handling Cholera Patients in the Theatres*

- If a cholera patient requires surgery, prepare the patient adequately for surgery in the usual way.
- Take extra precautions by padding the patient's buttocks with layers of cotton wool. Protect the operating table with draw mackintosh and incontinent sheets.
- At the end of the operation, disinfect the theatre table and floors and mop dry with diluted kynol solution.
- Leave for 30 minutes wash with available detergent solution. Clean the theatre walls with hypochlorite solution.
- Take swab from the operating theatre table for laboratory analysis to ensure there is no growth of *Vibrio cholerae* germs.
- Air the theatre for the rest of the day before the next case.

#### 4.8.2 The Obstetric Units

##### *Guidelines*

- Refer all suspected cholera pregnant women to their local clinics for thorough examination.
- If in normal labour, deliver them at their local clinics.
- Refer them to the nearest next level of health care facility with maternity unit if there is any obstetric complication, where the complication is dealt with and the patient is referred to the nearest cholera centre for treatment.
- Do not admit the patient into the admission room in the delivery suite.
- Admit the patient straight into the Isolation side room for barrier nursing; this prevents the spread of cholera to other women in the admission room.
- Allocate a midwife to attend to the patient until the patient goes to theatre if the patient needs a Caesarean section.
- Equip the Isolation room with equipment already mentioned.

#### 4.8.3 Premature Baby's Unit

##### *Guidelines in the Premature Baby's Unit*

- Premature babies, with immature immune system born to mothers suffering from cholera are at risk of developing cholera.
- After delivery, transfer baby to the isolation ward in the Paediatric Unit where the baby is barrier-nursed.
- Treat the premature baby as per unit guidelines for handling premature babies observing the standard precautions.
- Observe for any bowel motion.
- Take rectal swab or stool specimen for laboratory investigations.
- Communicate the result of the stool specimen to the doctor.
- If positive for *Vibrio cholerae*, the doctor starts the baby on cholera treatment.
- On discharge, disinfect the room as per guidelines for the wards.

#### 4.9 Record Keeping during Cholera Epidemic

The health personnel are required to keep the records of all the patients admitted in the cholera unit. The records help to see the trend of the epidemic as well as monitoring the control of the epidemic in each catchment area.

##### *ND 1 Form*

The Health Centre in-Charge uses the disease notification form called ND 1 to notify the individual cholera patient within 24 hours to the DHMT.

##### *Line list Form*

This has replaced the ND 2 Form. The Line-list form gives a list of patients seen suffering from various diseases (cholera inclusive). It includes their demographic characteristics, date of onset of the disease (in this case Cholera), its signs and symptoms and the outcome of the disease. The line-list form demonstrates the burden of the diseases seen at the health centre during the period of reporting. It is sent on a weekly basis to the DHMB and from them to the Provincial Health Office and then to the MoH.

##### *ND 3 Form*

The ND 3 is an aggregate of the ND 1 and the Line-list Form. It is sent to the DHMT on a monthly basis. It also includes zero reporting in cases when there are no cases occurring. It shows that the disease is being controlled.

##### *HIA 1 Form*

This is the Health Information Aggregation Form 1. The Health centre In-Charge fills this form quarterly and sends it to the DHMT office. The information that goes on this Form is derived from the Tally sheets and the Inpatient (HIR 2) and Out-patient Registers (HIR 1). The diseases are coded like malaria, tuberculosis, diarrhoeas which include cholera.

### *HIA 2 Form*

The In-Charge uses the above form to report on the service provision on monthly/quarterly/basis. During the cholera epidemic, the Clinic In-Charge also reports on the services provided during the cholera epidemic.

### *HIQ2 Form*

This is the Health Information Quality Assurance Form. This form is not sent to another facility but is kept at the reporting facility. Ordinarily, the In-Charge works out the percentages of the diseases seen in comparison with past morbidity rates in order to identify the trend of each disease. This information is later transferred to HIQ1. During cholera epidemics, the Clinic In-Charge works out the percentages of the cholera patients seen in comparison with the total patients seen at the health facility in order to ascertain the magnitude of the epidemic.

### *HIQ1 Form*

This is a problem-solving tool. It is a self-assessment tool and discusses how to maintain quality health care provision at the health facility. It notes the achievements, failures, weaknesses, constraints and the solutions. It also includes the recommendations to avoid future occurrences. The supervisors fill in this form and send it to the DHMT on monthly/quarterly basis. The DHMT responds to this form by providing the necessary logistics to prevent future outbreaks.

## **4.10 Guidelines at the District Level**

### **4.10.1 Contact Tracing**

The Environmental Health Technician (EHT) has to conduct contact tracing, give prophylactic treatments, inspect food premises and water sources, bury shallow wells and educate the communities on the importance of the maintenance of adequate environmental sanitation, good personal hygiene and good health practices. This can be done by mobilising communities

through the Neighbourhood Health Committees and working together with all the community-based agents in all the geolocations.

#### **4.10.2 Provision of Safe Water**

The provision of safe water is key to the prevention of cholera and other water-borne diseases. The EHT and the experts from the Water and Sewerage Company should analyse the bacterial levels in the water supply. Based on the results, the team should carry out health education on home chlorination, boiling of drinking water and the use of narrow-necked containers for safe storage of water. Communal taps should be installed while vandalised ones should be rehabilitated and new bore holes for water should be sunk where appropriate.

#### **4.10.3 Promotion of Food Safety**

The EHTs should carry out legal inspection of food premises invoking the relevant Public Health laws.

#### **4.10.4 Sewerage Disposal Systems**

The pit latrines in the compounds should be treated with Pitkings enzymatic preparations. The same enzymatic preparations can be used to treat septic tanks in most of the houses in the Site and Service areas.

#### **4.10.5 Restrictions of Public Gatherings**

The Public Health Act (295) section 30 can be exercised in order to prevent the gathering of more than five persons who are not blood relatives from gathering for purposes of social meetings. Under the same Act, markets can be closed for reconstruction and cleaning purposes.

#### **4.10.6 Community Health Education Messages**

The Neighbourhood Health Committees (NHC) should be mobilised together with the health centre staff, print media and electronic media staff to mount targeted health education messages to conscientise communities

on the importance of adopting preventive measures such as boiling or chlorinating all drinking water, storage of drinking water in narrow containers, good personal hygiene practices like washing hands and fruits before eating, washing vegetables before cooking, washing hands after using the toilet, avoiding over-crowding and movements to and from cholera affected areas. Influential national leaders, popular comedians should be used to create awareness in communities and in languages they are comfortable with during discussions on the radio and television.

Conclusively it can be said that all the above constitute the main stay of prevention and control of cholera outbreaks.

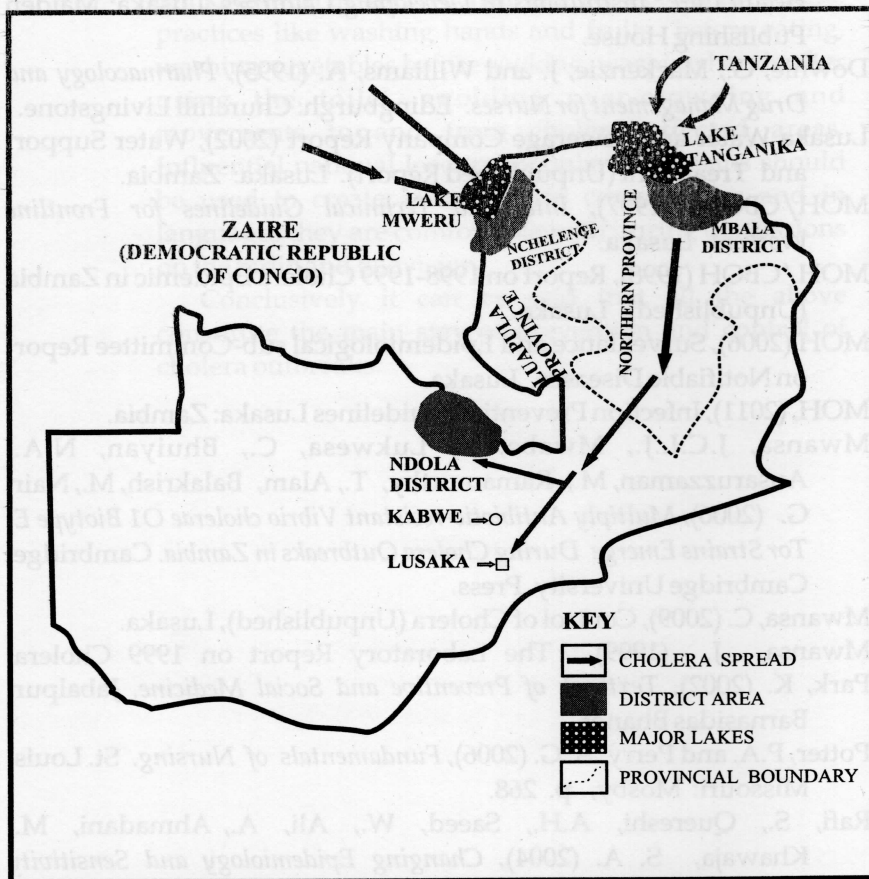
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## APPENDIX 1

## ORIGIN AND COUNTRY SPREAD OF CHOLERA



## APPENDIX 2

## Lusaka Urban District Council

## Daily Clinic's Recording of Cholera Patients

Name of the clinic-----

Catchment Area-----

Officer in Charge-----

PERIOD : 07.00 hrs -----/----- Till 07.00 hrs AM ---/---

## 1. Epidemiological Details

**A. Caseload details**Cases on treatment since yesterday and reported as new on  
previous day-----

New case added during the day-----

Total active cases added during the day-----

**B. Cases Discharged/Cured**-----**Cases Died**

In the clinic-----

At home-----

Total number of deaths-----

Total removed during the day-----

**C. Total number of active cases on treatment**

At the end of the day at 07.00 hrs -----

## APPENDIX 3

**LUSAKA URBAN DISTRICT COUNCIL**  
**PUBLIC HEALTH SERVICES DEPARTMENT**  
**VISITORS SURVEILLANCE FORM**

1. Name of the visitors/Returning Resident .....
2. Age ..... 3. Sex ..... 4. Town coming from/Visited .....
5. Residential Address .....
6. (a) Name of the person being visited .....
- (b) Residential Address .....
7. (a) Details of the people accompanying the visitor/Returning Resident.

Name	Sex	Age
.....	.....	.....

- (b) Details of the people found in the households in Lusaka being visited

Name	Sex	Age
.....	.....	.....
.....	.....	.....
.....	.....	.....

8. Length of stay in town visited .....
9. Length of stay in Lusaka .....
10. Any plans of visiting another Town in next 7 days .....  
YES/NO.
11. If yes, which Town .....
- Home Address .....

12. Any complaints of Diarrhoea or vomiting among any of visitor  
YES/NO
13. If yes, who and state date of onset and character of the diarrhoea  
andvomiting .....  
.....  
.....
14. Did any one at the home the visitor came from die of acute  
diarrhoea and vomiting? YES/NO
15. Were there any cases of suspected cholera within the area where  
you came from? YES/NO
16. If yes, did you personally get in contact with any case of cholera  
..... YES/NO
17. What type of toilet were you using where you came from?
  - (a) Pit latrine
  - (b) Water borne
  - (c) None
18. What is the source of water supply at the area you are staying in  
Lusaka.
  - (a) Borehole
  - (b) Shallow well
  - (c) River/Dam
  - (d) Pipe borne water
  - (e) Others (specify) .....

**APPENDIX 4****LUSAKA URBAN DISTRICT COUNCIL  
CHOLERA SURVEILLANCE  
CHOLERA INFECTED AREAS****(a) NEIGHBOURING COUNTRIES**

Zaire,\* Tanzania\*, Mozambique, Malawi, Zimbabwe, Angola and South Africa.

**(b) WITHIN ZAMBIA**

Northern Province\*, Luapula Province\*, Copperbelt Province\*  
Please report to the Medical Officer of Health if the answer is yes to No 12, 13, 14, 15 and also where the answers are 18( c) and 19 (a), (b), (c) and (e)

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*'Nursing Management of Cholera Patients in Zambia'* basically, is a book on the resuscitation of the dehydrated cholera patients. It has four chapters. Chapter One deals with the origin and magnitude of cholera in Zambia which justifies its documentation to demonstrate the urgency of the target groups meeting the objectives of the book, the micro-organisms which cause cholera, its signs and symptoms and the modes of transmission. The book underscores the importance of transferring clinical experience to health care professionals who man rural health centers in the absence of Medical Doctors due to the critical shortage of staff as well as to the higher and tertiary institutions of learning for the benefit of clinical preceptors and their students both at the pre-and post service areas.