



ကျန်းမာရေး

# စေတနာတော်

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- **ပြန်လည်ကြောစနစ်**  
Lymphatic System
- **ပြန်လည်ကြော ဆင်ကြီးရောဂါ**  
Lymphatic Filariasis



- **အာဟာရဆိုင်ရာ ပညာရေး**  
Nutrition Education
- **ဆွန့်ပစ်ပစ္စည်းများ ပြုစုမှု**  
Waste Management

# Health Messenger

ISSUE 13  
BURMESE EDITION  
JUNE 2001



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# Editorial

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Dear Readers,

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In this issue, we introduce the anatomy and physiology of the lymphatic system. We also discuss a disorder of the lymph system caused by parasitic worms: the lymphatic filariasis. This disease is still present in Myanmar and Thailand, and cases are reported in the refugee camps. Curative and prophylactic appropriate treatments can reduce the prevalence of microfilaria.

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We have also included topics on postnatal care of the mother after normal delivery, nutrient deficiencies and an example of waste management in Nu Po camp.

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Last but not least, we give you a report on the workshops we conducted in 4 refugee camps along the border. These workshops are intended to bring the magazine closer to you – readers – and to encourage you to become reporters and contributors of news, information or articles we could publish.

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We hope to renew this experience and to meet you again in the near future. Enjoy your reading!

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Best regards.

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Dr. Seerat Nasir  
Editor

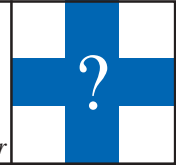
**Health Messenger Magazine Program**  
 117/9 Sukhumvit Soi 4, Soi Samaharn, Klongtoey, Bangkok 10110 Thailand.  
 Tel: 02 656 9370, Tel/Fax: 02 656 8869, E-mail: hmess@loxinfo.co.th

Editor/t, f Dvmt	Dr. Seerat NASIR
Editorial Advisors/t, f Dvmaumifrvd	Dr. Cynthia Maung, Dr. Jerry Vincent, Dr. Jonathan Nield, Dr. Francois Nosten, Dr. Ann Burton, Philip Galvin
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# Lymphatic System

Health Messenger



*The lymphatic system, like the cardiovascular system, moves fluid throughout the body; but there are clear differences between these two systems. The lymphatic system is responsible for maintaining the fluid balance and immunity of the body. In this article we will describe in short the structure of the system and its components.*

The lymphatic system is not a closed, circular system like the cardiovascular system and it does not have a central pump. It is made up of a network of thin-walled vessels that carry a clear fluid called lymph.

(jye&nVilf vifzk) Lymphatic vessels



jye&nVilf vifzk  
Lymph node

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(Fig.2) A lymph node positioned near a blood vessel

## Functions of the lymphatic system

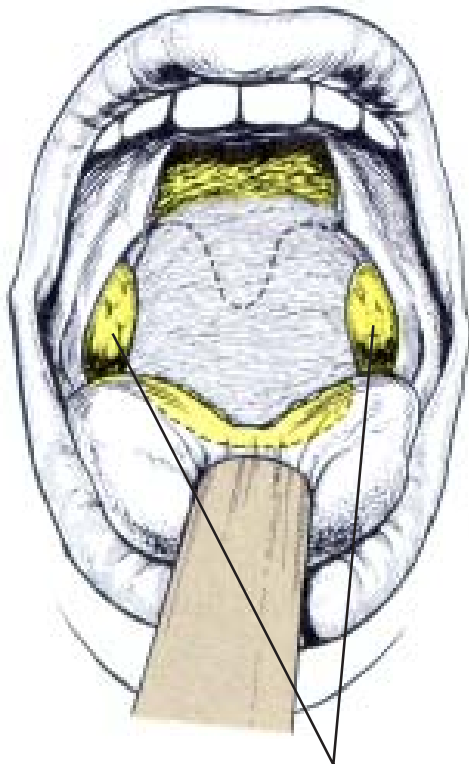
The lymphatic system performs four major functions:

1. It collects excess water and proteins from the interstitial fluids (liquids in the tissue spaces, which provide nourishment) and return them as lymph to the bloodstream.
2. It transports fats from the tissue surrounding the small intestine to the bloodstream.
3. It destroys microorganisms and other foreign substances.
4. It provides long-term protection against microorganisms and other foreign substances.

## Components of the lymphatic system

The lymphatic system begins with very small vessels called *lymphatic capillaries*, which are in direct contact with interstitial fluid and surrounding tissues. The system collects and drains most of the fluid that is

**Lymph:** It is a clear, slightly yellow liquid found in the lymphatic vessels. It is derived from the tissue fluids. The body contains about 1 to 2 liters of lymph. Lymph is similar to blood, but it does not contain red blood cells and most of the proteins found in the blood. The cells of the lymph fluid are *leukocytes*, and they perform the similar protective functions as leukocytes in the blood. The leukocytes include, *monocytes*, *histocytes* and *lymphocytes*.



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Palatine tonsils

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forced out of the bloodstream and accumulates in the spaces between the cells.

The small lymphatic capillaries unite to form larger lymphatic vessels called *lymphatics*, which pass through specialized structures called *lymph nodes*. These larger vessels again forms two main drainage ducts that return the excess fluid to the bloodstream through some specific veins.

In addition to the lymphatic capillaries, lymphatics, and lymph nodes, the lymphatic system consists of lymphoid organs: *the spleen* and *thymus glands*. The three pairs of *tonsils* are actually lymphatic tissues of the throat region. Finally, aggregated lymph nodules, which are scattered throughout the small intestine, help initiate the secretion of antibodies.

**Lymphocytes:** There are two basic types of lymphocytes, **B cells** and **T cells** (also called **B lymphocytes** and **T lymphocytes**). These lymphocytes are important for the immune system of the body. The B cells produce specific antibodies and the T cells attack specific foreign cells. The lymphocytes are the back-bone of the immune system, and are the basis of the immune response.

**Lymph nodes:** These are small (1 to 25 mm in length) bean-shaped masses of tissue scattered along the lymphatic vessels. The nodes are found in the largest concentrations at the neck, axilla (underarm), thorax (chest region), abdomen, and groin. Lesser numbers are found behind the elbow and knee. Most lymph passes through at least one lymph node on its way back to the bloodstream.

Lymph nodes filter out harmful microorganisms and other foreign substances from the lymph. Lymph nodes also start specific defenses of the immune response.

**Tonsils:** Tonsils are unusually large groups

of lymph nodules located under the mucous lining of the oral cavity and the nasopharynx (back of the throat) (Fig. 3). They form a protective ring of lymphatic tissue around the openings between the nasal and oral cavities and the pharynx and provide protection against bacteria and other potentially harmful materials in the nose and mouth. In adults the tonsils decrease in size and eventually may disappear.

There are three groups of tonsils: *the palatine*, *the pharyngeal* and *the lingual*. The **palatine tonsils** usually are referred to as “the tonsils”, and they are relatively large, oval lymphoid masses on each side of the posterior opening of the oral cavity. The **pharyngeal tonsil** is the collection of a closely associated cluster of lymph nodes near the internal opening of the nasal cavity (pharynx). An enlarged pharyngeal tonsil is called the **adenoids**, and it can interfere with normal breathing. The **lingual tonsils** are on the posterior margin (base) of the tongue. **Spleen:** The spleen is the largest lymphatic organ in the body. It is about the

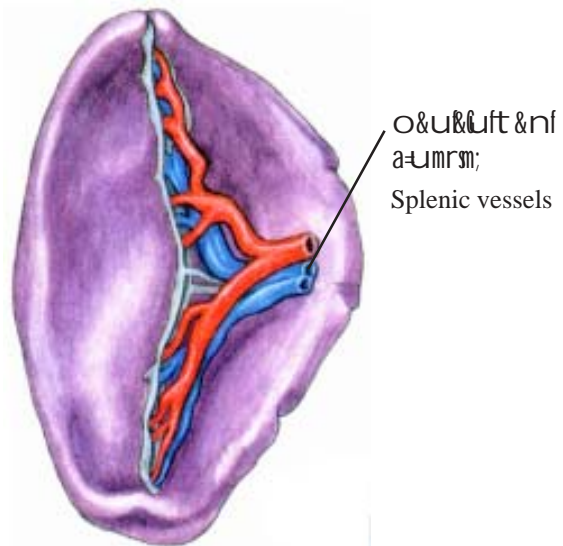


Fig. 4 (4) Splenic vessels (Fig.4) Spleen







size and shape of a clenched fist, measuring about 12 cm in length, and is purplish in colour (Fig. 4). It is located on the extreme left superior, posterior corner of the abdominal cavity, just below the diaphragm. It rests on portions of the stomach, left kidney, and large intestine.

The spleen filters the blood and produces phagocytic lymphocytes and monocytes, destroys old red blood cells, and acts as a blood reservoir. The spleen does not receive lymphatics and lymph, so it cannot be considered a filter as a lymph node. Efferent lymphatics, which leave the spleen, contribute lymphocytes, monocytes, and macrophages to the lymph.

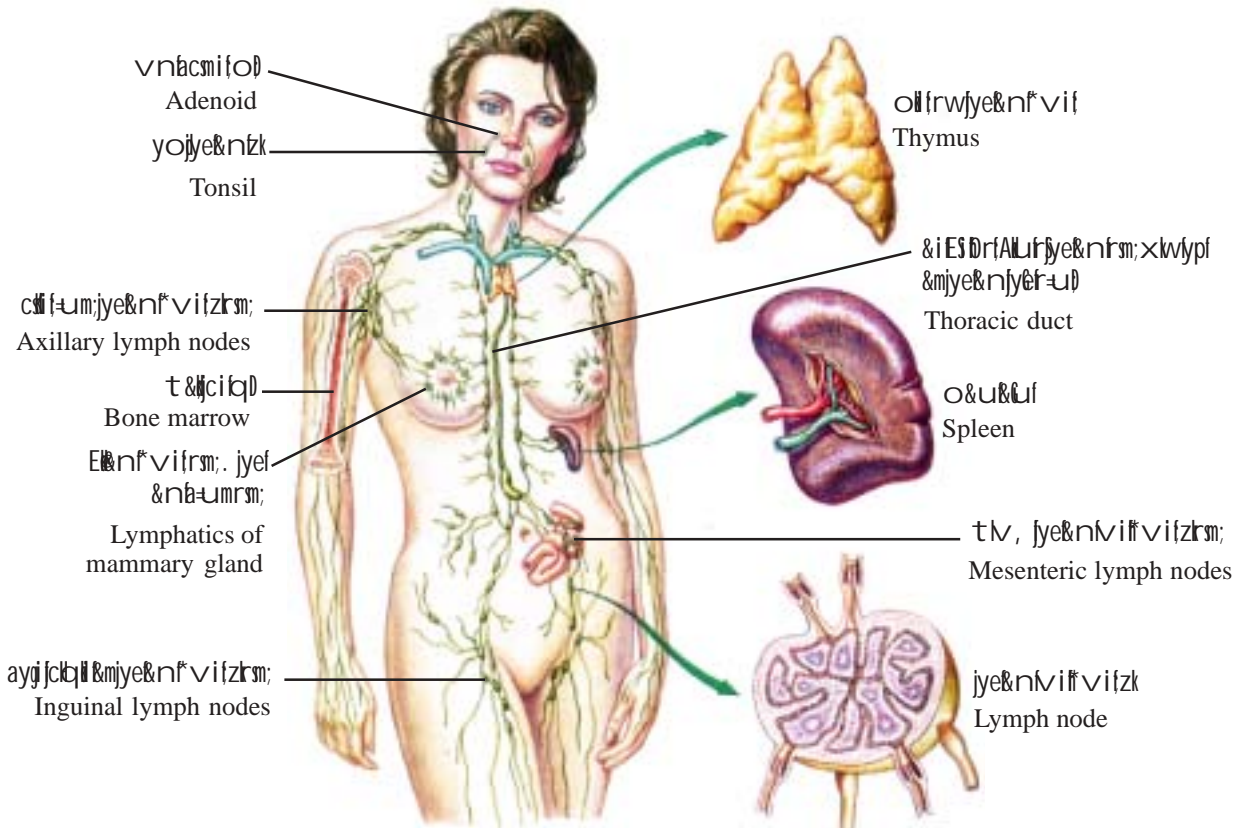
**Thymus:** The thymus is a ductless, pinkish-gray mass of lymphoid tissue located in the thorax. It has two portions or lobes joined by connective tissue and surrounded

by a capsule of connective tissue. It is roughly triangular in shape. It overlies the heart and major blood vessels (Fig.5).

The function of the thymus is to produce lymphocytes, which then move to other lymphatic tissues where they can respond to foreign substances.

The foetal thymus gland produces lymphocytes and assists in the formation of antibodies in other parts of the foetus. The thymus gland is relatively large at birth, forms antibodies in the newborn, and plays a major role in the early development of the body's immune system. It increases in size from birth to puberty, and it is most active in childhood and early adolescence. It produces a hormone called *thymosin*. The thymus gland shrinks progressively during adulthood and change to fatty and connective tissue in old age.

Figure 6 (Lymphatic system)





<b>Structure</b>	<b>Major functions</b>
Lymphatic capillaries	Collect excess interstitial fluid from tissues.
Lymphatics (collecting vessels)	Carry lymph from lymphatic capillaries to veins in neck.
Lymph nodes	Situated along collecting lymphatic vessels; filter foreign material from lymph.
Axillary nodes	Drain arms, most of chest wall, breasts, upper abdominal wall.
Supratrochlear nodes	Drain hands, forearms.
Cervical nodes	Drain scalp, face, nasal cavity, lower abdominal wall.
Intestinal nodes	Drain abdominal viscera (organs).
Inguinal nodes	Drain legs, external genitalia, lower abdominal wall.
Iliac nodes	Drain pelvic viscera.
Lumbar nodes	Drain pelvic viscera.
Tonsils	Destroy foreign substances at upper entrances of respiratory and digestive systems.
Spleen	Filters foreign substances from blood, produces phagocytic lymphocytes, stores red blood cells, releases blood in case of extreme blood loss.
Thymus	Forms antibodies in newborn; involved in initial development of immune system; produces a hormone called thymosin.

## Glossary

<b>Interstitial:</b>	Space between the tissues.
<b>Phagocytes:</b>	Any cell capable of ingesting particulate matter, like microorganisms or cell fragments.
<b>Phagocytosis:</b>	The process by which phagocytes engulf particulate matters. This is a process used by the immune system to destroy invasion of foreign matter or microorganism.
<b>Viscera:</b>	Any large internal organ in the body cavities.



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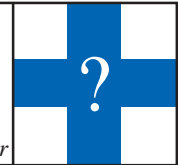
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# Lymphatic Filariasis

Health Messenger



*Filariasis is a disease of the tropical countries. It is caused by round, thread-like parasitic worms. The most common infection is with a parasite that lives in the lymph system. It is called lymphatic filariasis. This article will provide some basic information about the cause, transmission and treatment of the disease.*

## What causes lymphatic filariasis?

Filariasis is caused by three types of parasitic worms: *Wuchereria bancrofti*, *Brugia malayi*, and *Brugia timori*.

## Where is lymphatic filariasis found?

Lymphatic filariasis is a disease of the tropics. At least 120 million people in 73 countries worldwide are estimated to be infected with filariasis parasites. *Wuchereria bancrofti*, the most common filariasis parasite, affects about 100 million people in Africa, India, South East Asia, the Pacific islands, South America, and the Caribbean. The *Brugia malayi* and *Brugia timori* parasites affect about 12 million in Southeast Asia. Lymphatic filariasis in Myanmar and Thailand is usually due to *Wuchereria bancrofti*; some cases of *Brugia malayi* may be found.

## How is lymphatic filariasis spread?

A healthy person is infected with filariasis from an infected person by mosquito bites. Adult worms are found in lymph vessels and nodes in an infected person, where they can live for 10 years or more. The female worms release large numbers of very small worm larvae (microfilariae),



(Fig. 8) Distribution of filariasis shown in red

which circulate in an infected person's bloodstream. When a mosquito bites an infected person, it can ingest the microfilariae. These grow inside the mosquito and later can spread to other people via mosquito bites.

After a bite, the larvae pass through the skin, travel to the lymph vessels, and develop into adult worms, which live for many years. Then the cycle begins again.

## Who is at risk of lymphatic filariasis?

Those most at risk are people who live in or stay for a long time in tropical areas where the disease is common. Short-term tourists rarely get filariasis. Getting an infection with symptoms usually requires several mosquito bites over a long period of time.

## Signs and symptoms

Lymphatic filariasis may not cause any symptom in majority of the cases. Most of



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(Fig. 9) Chyluria

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the signs and symptoms of filariasis are consequences of adult worms living in the lymph vessels. Some patients may develop lymphatic dysfunction, which is the result of tissue damage caused by the worms blocking the normal flow of lymph inside the lymph vessels. Symptoms can appear 5-18 months after a mosquito bite.

The symptoms may be found in 3 stages: **Asymptomatic stage:** microfilariae are found in blood, but not associated with clinical signs. Some individuals remain asymptomatic for years, while others progress more rapidly to the acute and chronic stages.

**Acute stage:** attacks of fever associated with lymphadenitis and lymphangitis (inguinal, axillary) and orchitis/epididymitis occur. Often an attack is precipitated by hard physical work. It lasts for several days and subsides after bed-rest.

**Chronic stage:** occurs after 15 years only in a small proportion of infected persons (immigrants from non-endemic areas tend to develop elephantiasis more often and sooner). The most common symptoms are:

hydrocele and elephantiasis of scrotum, leg, arm, vulva and breast, chyluria. Microfilariae are usually absent.

### Diagnosis

Filariasis is diagnosed by blood test.

### Treatment

Treatment consists of:

- 1) medicine to kill circulating larvae and adult worms.

WHO recommends mass treatment campaigns (except children <2, pregnant women and disabled persons):

- Diethylcarbamazine (DEC) 6mg/kg single dose biannually;
- DEC + Albendazol 400mg, not for children <2 years) annually.

This is also applicable for the refugees in the camps including new arrivals.



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(Fig. 10) Elephantiasis of the leg



yW(11) a0\$apht dwcqihjcaxmub&m\*g  
(Fig. 11) Elephantiasis of the scrotum



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- j c i p o n h t i f q u r s m ; r E p b o u a o m p y a & ( a q ; & n ) u l l t o m ; a y ; w f i j z e f x m ; y g a & m \* g o , f a q m i x m ; a o m o w l D g j c i i ) u l l E s h e i f a & ; v p l v a o ; v y & B ; r o n f y g w D e f u s i f t a e t x m ; E s h u s e f m a & ; y n m a y ; e l l c j c i f w l a y ; Y t a j c y K l y a q m i e l l o n ?

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**Tropical pulmonary eosinophilia:** it is a condition arising from filarial infection. It presents features like symptoms of asthma associated with high eosinophil count in blood (>3000). The onset is with cough, weakness, dyspnoea on exertion and asthma, especially at night. It is often associated with fever and splenomegaly. But microfilariae are never found in blood.

**Elephantiasis:** presents a horrifying image of the chronically ill patient. The feet, legs and testicles are massively swollen. This can lead to severe disfigurement, and often normal walking is no longer possible leading to long-term disability. The filaria germ destroys the lymph tracts and as a result the lymph can no longer flow out and becomes congested in the affected parts of the body.

- 2) skin care with soap and water to prevent secondary infections.
- 3) elevation, exercises, and, in some cases, pressure bandages to reduce swelling.

### Complications of lymphatic filariasis

Lymphatic filariasis is rarely fatal, but it can cause recurring infections, fevers, severe inflammation of the lymph system, and a lung condition called Tropical Pulmonary Eosinophilia (TPE). In about 5% of infected persons, a condition called Elephantiasis occurs.

### Prevention of lymphatic filariasis

Lymphatic filariasis is among the world's leading causes of permanent and long-term disability. The number of infected persons is increasing worldwide, mostly due to the increased urbanization in many areas where the parasite is common. There is no vaccine for filariasis.

Prevention focuses on mass treatment with anti-filariasis drugs to prevent ingestion of larvae by mosquitoes, public health action to control mosquitoes, and individual action to avoid mosquito bites. To avoid being bitten by mosquitoes:

- If possible, stay inside between dusk and

dark. This is when mosquitoes are most active in their search for food.

- When outside, wear long pants and long-sleeved shirts.
- Spray exposed skin with insect repellent.

A vector control campaign based on environmental measures and health education can be conducted.



*Parasitic larvae that block lymphatic drainage produce tissue oedema, resulting in elephantiasis*



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(Fig. 13) Elephantiasis of the breast



yW(15) a j c a x m u E s h o s a p h t w l f q i h j c a x m u h & m \* g  
(Fig. 15) Elephantiasis of the leg and scrotum



yW(14) q i h j c a x m u h & m \* g j z p b o f t a p m y w l f  
b, l o u h j c a x m u j y e & n h = u m y w l v c h & m i & r f e m  
(Fig. 14) Lymphoedema left leg early in the  
course of condition



yW(16) a j c a x m u E p z u p v h y e & n h = u m y w l v c h & m i & r f e m  
j z p j c i f b, l o u h j c a x m u q i h j c a x m u h & m \* g j z p j c i f ?  
(Fig. 16) Lymphoedema both legs,  
Elephantiasis left leg

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t p m a j c v l y i e f v l y h a e p o f t l t w l f & d t p m r s v i j y e & n h = u m r s m; (v u i w l p f  
a c: t q h x h y e & n b, h a q m i h o m t w l f t a j c c b n h y e & n f r f a = u m i f) r s  
p l w f, h o m e l h & m i & d t & n f q l i f w l v i j y e & n h s h t q d t p u i u a v; r s m; y d i o n?

### Glossary:

**Asymptomatic:**

No symptoms present.

**Lymphangitis:**

Inflammation (infection) of the lymph vessels.

**Chyluria:**

Presence of chyle in the urine.

**Chyle:**

The milky fluid taken up by small lymph vessels (lacteals) from the food in the intestine during digestion. It consists of lymph and fat droplets.







## Situation on the Thai-Myanmar border

### Refugee camps

**1996:** In Maela camp (MSF), 1% of the population was randomly screened (273 patients), prevalence = 0.

**1998:** In Mae Sariang area (MHD), prevalence = 5%.

**August to November 1999:** In Ban Don Yang (ARC), screened 89% of population, microfilariae present in blood = 0,95% (17 cases, 2 symptomatic).

### Literature and Press

**1995:** Department of Community and Social Medicine of Mae Sot, on 8 377 Myanmar migrants, prevalence = 2.5% (5 symptomatic), ranging from 5% for those who stayed <1 year, to 1.3% after 5 years.

**1996 CDC Annual report:** Tak, Mae Hong Son and Kanchanaburi provinces, rate = 1%.

**March to May 1998:** 225 people from endemic villages of Maechan sub-district, Tak province, test rates varied among various methods (from 5.3 -5.8% to 20%).

**July 1999:** Study in Mae Sot district, 654 Myanmar migrants workers, microfilaria prevalence rate = 4.4%.

Thailand has tried to eradicate lymphatic filariasis by mass campaigns, in the past with great reduction of endemicity. Filariasis transmission in urban areas of Thailand had never been reported before 1994. In Myanmar, *W. bancrofti* microfilaria rate is above 4% (WHO, 1992). *Aedes* and *Culex* mosquitoes are abundant in western Thailand. Thai Health Authorities consider that the re-emergence of the disease is due to the arrival of refugees and illegal migrants from Myanmar.

All NGOs received a letter from Ministry Of Interior (MOI) on March 24, 2000 requesting “a solution to filariasis current problem including setting up a special program in every displaced camp”.

According to Dr Suvannadabba, regarding Filariasis Control, the actual Thai policy is to start mass treatment if microfilariae rate is >0.6%. DEC will be used (and supplied by MOH). Every refugee as well as all new arrivals (except children <2, pregnant women and disable persons) should receive biannually DEC single dose or annually a regimen of DEC + Albendazol.

*Courtesy Dr. Elise Klement, MSF*



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t ð f y i f r ð z ñ; u o n l t r ð o r ð r m; o n l a q; & ð v f  
r ð z ñ; & e f t w l u f q ð j z w c s e f y i f o w l e o n l  
r ð z ñ; y ð o n e s h j z p e l l v # f j z p e l l c s i f a q; & ð f q i f & e f  
p d w f t m; x u b e f u o n l o m r m e f t m; j z i h  
u a v; a r g z ñ; y ð p t r ð o r ð t m; e p f r ð t u j z w f  
p p a q; e l l o n l y x r t m; j z i h t c s i f x l v y p y ð o n e s h  
c s u j c i f t u j z w p p a q; j c i f / ' h v d t m; j z i h  
a r g z ñ; y ð c s e f s 24 e m & ð t w l f t u j z w p p a q; j c i f  
j z p o n l T t a j c c p r f p p c s u r s m; t a w m f r s m; r s m; u l l  
t ð f y i f a q m i & u b l l o n l



**aumi f p ð r s v l o m; y g ? ? c l i f c s u r & ð**  
j u l w i f u m u g j c i f r s m; ( v u f r s m; a q; & e f /  
v u f t y p y & e f c e f o w p l e s h r s u b h z k o w & e ) t m;  
t j r w r f j y k v l y u s i l o l o i o n l t x l o j z i h  
o m; z ñ; y n m w l f a o g e s h c e m u l l f r s t j c m;  
t & n r s m; o n l t v e x a w & e a v & ð o m a u m i h  
u s i l o l o i o n l t m; v l a o m & ð m v u b n f e s h  
o m; z ñ; q & m r o i f w e f t p ð t p o f t m; v l l w l f  
u l; p u & e f t E l l m, f & ð o m t c l h t v r f r s m;  
( v e m e s h v u b n i t w l u ) u l k n b l f x m; o i h  
o n l

uav; rðzñ; yð c s e f y x r p p a q; j c i f ( r ð z ñ; y ð y x r  
w p e m & ð t w l f )

**a o g, h j i f c i f ? ?** r t \* f r s t v e f t u l l a o g, h j i f  
j c i f r s m; u l l p p a q; j c i f e s h o r f a l l u a t m u f y l l f w l f  
o m; t f r m; y l l j y e l u s t o f r; a u m i f & ð & v u j z i h p r f  
o w p p a q; t w n j y l & r n l a o f c e e f u p r f o y l y ð  
t m; e n f a o m a o f c e e f e s h j r e b o m a o f c e e f & ð g u  
t a p m i l t m; v e m a o g, h j i f r & ð u m i f / r t \* f r s a o g  
r j r i f a w & y g u t w l f y a o g, h j i f r j z p e l l a u m i f  
o w j y k e l l u m; x m; o i o n l

**a&m\* g l D i j c i f ? ?** r ð z ñ; r t m; v l l w l f u s e f r m o e f s f  
a& ; u l h o c m p ð o w j y k o i o n l o m; t ð f w l f t  
a j r s a m i & r f e m. a & s o ð v u l o m r s m; r ñ t z s m; e n f  
e n f j z p o n l ( r ð z ñ; y ð t r ð o r ð r m; t m; v l l u l l f  
t y c s e f r e f e f p p a q; a y; o i o n l ) ? o m; t ð f e m j c i f  
w j z n i j z n f w l v m j c i f e s h t e k q l l a o m r e f r t \* f r s  
t j z l q i f j c i f w l z p o n l a & r ñ & n l, h j i f j c i f. & s r f  
v m; a o m ( a r g z ñ; y l c s e f s e p l q, h v; e m & ð u f y l a o m )  
& m z o i & j c i f / o l l [ k w l c u t a o m o l l [ k w l r o e f s f  
a o m r ð z ñ; j c i f p o n h & m z o i f r s m; & ð g u x l a & m \* g t w l f  
o l b, w l y ñ; o i o n l

**a o g z d t m; j r i h v u f c i f ( a o g w l j c i f ) ? ?**  
u l l D e a q m i p o f y l l f a o g z d t m; & ð l v # a w m i f r s  
a o g w l j c i f r ñ j z p l y ñ; e l l o n l ( r ð z ñ; y ð a e m u l l f  
t r ð o r ð t m; v l l a o g z d t m; ( a o g a y i f c s e f )  
r e f e c e l o i o n l ) o a e a o g w u f c i f j z p l y ñ; r r s m; .  
e p l q, h i g & m c l l e e f r ñ r ð z ñ; y ð a e m u l j z p l y ñ; j c i f  
( t j r w r f v l l a v; q, ð p e m & ð t w l f ) j z p o n l

uav; rðzñ; yð c s e f l w d p p a q; j c i f

rdift t f o l l j y e f ð u a v; r ð z ñ; y ð c s e f ' l w d p p f  
a q; j c i f u l l j y k v l y o i o n l y x r p p a q; r u l l  
j y k v l y c h o m o m; z ñ; q & m r o l l [ k w l v u l o n f r s  
u a v; r ð z ñ; y ð c s e f ' l w d p p a q; j c i f u l l j y k v l y g u  
y l l a u m i f o n l

# Care of the Mother after Delivery: Normal Postnatal Care

Dr. Rose Mc Gready, SMRU



*This article will focus on how to take care of a mother after normal delivery, whether at home or in the hospital*

Traditionally in Asia many women deliver at home. When women decide to deliver in a hospital they are normally keen to be discharged as soon as possible after the delivery process. Normally there should be two assessments of the post-partum woman: *the first* immediately after the expulsion of the placenta and *the second* assessment within 24 hours after birth. Most of these basic checks can also be performed at home.

NB: Universal precautions [wash hands, wear gloves, gown and mask] should always be practiced especially in obstetrics where contact with blood and other body fluids is so common. The risks of infection (for patient and birth attendant) should be included in all TBA and midwife training programs.

## The 1<sup>st</sup> post-partum check (during the 1<sup>st</sup> hour after delivery)

**Bleeding:** check for excessive vaginal bleeding and confirm by palpation that the uterus is hard and contracted in the lower abdomen. Check the pulse - a weak and rapid pulse should alert the attendant to bleeding, possibly internal bleeding if there is no blood visible at the vagina.

**Infection:** careful hygiene must be observed in all deliveries. Early signs of endometritis include moderate fever (routinely check the temperature of all women after delivery), slightly increased uterine pain and foul-smell-

ing vaginal discharge. Suspicion should be increased if there has been a long history (>24 hours from the time of birth) of amniotic fluid leakage or a difficult or unclean delivery.

**High blood pressure:** high blood pressure can occur even after there has been normal blood pressure recorded during pregnancy (routinely check the blood pressure of all women after delivery). About 25% of eclampsia occurs after delivery (almost always within 48 hours).

## The 2<sup>nd</sup> post-partum check

Before the mother leaves for home a 2<sup>nd</sup> post-partum check should be carried out. It is better if the same midwife or birth attendant who did the first check performs the 2<sup>nd</sup> post-partum check.

**Vaginal bleeding:** check if vaginal bleeding is normal or excessive. Also feel if the uterus is contracted or soft.

**Temperature:** any post-partum fever should be completely investigated. If untreated it





**re/r t \*l r Saobqifjicif** ?? omrme f o l r [ kvf  
 v e l u a o m r e / r t \* l r S a o b q i f j i c i f & t & l p p a q ; y g  
 o m ; t r l u l j c i f o l r [ kvf a y s m a j y m i f j i c i f j z p a e a u m i f  
 & t & l u l v n f r p r o y l y g

**u l f t y c e f** ? u a v ; r d z h ; y d c e f r n b n h t z s m ;  
 u l r q l y l j y n p b n p p r t p p a q ; o i f o n ? r u k o y g u  
 a o f r e f w u f j i f ( a o f x l b u l v l e d , m ; y l o i f c i f ) e s h  
 t o u q l e l j i f j z p e l l o n ? u a v ; r d z h ; y d c e f t z s m ;  
 j z p y f n ; & a o m o m r m e f t a u m i f t c u s r s m ; r b i o m ; t f  
 w l f a j r S a m i & r f j i c i f / i l u z s m ; a & m \* g & i f a c g i f y l l f w l f  
 a & m \* g y l o i f c i f / q d v r f a u m i f w l f a & m \* g y l o i f c i f  
 ( , l w d t l l a & m \* g ) e s h e l t l l a m i & r f e m ( e l e m u s i f j i c i f )  
 w l z p o n ?

**a o f z t m j r i l v u l j i f ( a o b w l j i f )** ?? a q ; & l r s q i f  
 c i f o w l j i f o l r [ kvf a c g i f u l l j c i f e s h y g v o u l l

j y \ e m w p p l v p & m & y g u a o f z d t m ; ( a o f a y g i c e f )  
 w l l f w m p p a q ; j c i f j y k v l y o i b o n ?

**a o f t m e n f a & m \* g** ? r s u l q u a j r S a z s m a w m j c i f e s h  
 w p l e s ; r s m ; t a & m i f a z s m a w m j c i f ( t o m ; t a &  
 j z l a z s m a z s m j z p j c i f ) o n l a o f t m ; e n f ; a & m \* g .  
 v u e % m r s m ; j z p o n ? x l u b l a o m t r l o r d r s m ; o n f  
 q l e l o n ; a o m a o f t w l u l p p a q ; o i l y l o i l a w m l a o m  
 u b r j y k v l y o i b o n ?

**y x r o d q l h o b ; a o m q d** ? r d i u l l t & n f s m ; r s m ; a o m u f  
 & e f w l u l w e f y l o r y l e f t w l l q d o n ; e l l a u m i f e s h  
 q d y w j c i f r & a u m i f a o c s m a t m i f y k v l y g

**r d i e l v l u j c i f** ?? z e l q e l l i l r s m ; w l f u a v ; t o u f  
 & S & y l v n & e f a t m i r i p b n r d i e l v l u l a u l ; a & ; o n f  
 t " l u t c s u j z p o n ? r d i r s m ; o n f o l r w l e  
 u a v ; r s m ; a r e z h ; v m c e f r s l r d i e l v l u l a u l ; & e f  
 t m ; w u b a & m j z p o i b o n ?

## r d i e l v l u j c i f

u e f r m a o m u a v ; i , l v p d o n f e l l e f t c l i t v r i & l v s f a r e z h ; y d c e f s w p l q , l i g r e p f s r e p f  
 o l q , f t w l r d i e l v l u j o i b o n ? u a v ; o n f r d i e l v l u j o i b o n ? u a v ; o n f r d i e l v l u j o i b o n ? u a v ; o n f r d i e l v l u j o i b o n ?  
 y l u l u i w i f a c : a [ m r l e f e s h o m ; t r l u l u l a p a o m a t m u p l v p i f a c : a [ m r l e f u l x l a p & e f v l a q m e l q a y ; o n ?  
 T o l y i f y k v l y a o m v n f e l a u m i f p n x l u a p & e f e p & u i r s o l k u u m w w o n ? r d i o n f a r e u i f p u a v ;  
 e l e s i v m y g u e l l r n b n h t c e l r q l a y ; p l a r n ? e l y l o n f t a ; ) u l o n ? v u b n i o l r [ k w i o e m j y l o n f  
 r d i o p t m ; u a v ; t m ; r n l u b e l v l u r n l u l y o o i o n ?

r d i e l [ k w a o m t p m ; t p m r s m ; ( o u m ; / a & / j y m ; & n ) w l e n f a r e u i f p u a v ; u l l o r f a v s n a p j c i f e s h  
 t o u q l e l j i f r s m ; j z p a p e l l o n ? e l d & n f ( y x r - e l a n ) w l y g i f a o m y & l v i f " g v l o u m ; e s h y q l y p h f  
 r s m ; u l l y p l v j y k v l y e l l a o m y l o e n t j i z i v l y x m ; o n h e l a n f & l y g u a v ; p w i e l e l v s i f u a v ; . a w m i f  
 q l e s u i t & e l a y ; p l a r n ? t p o f t j r l v l r d i e s l u a v ; o n f & u i t c l a v m o n e s f o i l a v s m a o m y l e f t p o t p o f  
 r s m ; j y k v l y m e l l o n ? u a v ; o n f t j r w r i v l l t p m p m ; y d e s e m & d s o l e m & d t w l f t p m t d f w l f  
 t p m r & a w m l o l i l v l r n ? q l i f t c e l o n f e l l t w l f e l y e j z n l e f v l l t y a o m t c e l j z p o n ? u a v ; t o u f  
 a v ; v r s a j c m u l v w l l a t m i f r d i e l v l u l a u l j c i f a c s m a r e & y g u t j c m ; j z n l v i f a y ; & e f t p m r v l l t y l o l  
 r d i e l v l u l a u s j i f u l u a v ; t o u f e p e p f t x d q u v u l u l a u l ; o i b o n ?

e , p y r s t r l o r d t a w m r s m ; r s m ; o n f o l w l e r d i e r s m ; e s h t r l o r d a q e l r s m ; x l s r d i e l v l u l a u s r  
 t a u m i f t u l l m % & & u o n ? o l m w l T o n l u l v u b n b n f t m ; x m ; & e r o i l a y ? a r e z h ; y d r d i f t m ;  
 a p m i a & n u j c i f r y d q l c i f r d i e l v l u l a u l j c i f r e f s u e l e l w l v l u s v y a q m i & e l v l u m i f t w n j y l o i b o n ?  
 y x r q l u a v ; a r e z h ; a o m r d i o n f t j c m ; t r l o r d r s m ; x u i y l l t u l t n l v l l t y o n ? a r s n i v i x m ; a o m  
 t c e l r w l l r w l f a r e z h ; a o m o l r [ kvf u l l f t a v ; c e l r j y n a r e z h ; j c i f ( j u d x h ; r a e s n i a e s ) a r e u i f p u a v ; u l l  
 y l l \* & p l u r \_ v l l t y o n ?

r s v e s u l ? ? b , & b , & a & m \* g ( x l e m p l u l l a z m e m ) o n f e l v l u l u a v ; r s m ; w l f o m r m e f t m ; j z i l j z p l v w l y l  
 a o a p e l l o n ? t r e f t m j z i l p c e f r s m ; t w l f e s h e , p y & d t j c m ; a e & m r s m ; w l f t p m ; t p m r s m ; o n f q i l w l u o n f  
 ( q e e s l i g u l l a & m a e l l i p m ; - u o n ) ? x l e u m i h o l l r i f ( b d v m r i l b d 1 ) j z n p l u r r n e l v l u r d i e r s m ; .  
 p m ; a e - u t p m . t p l v l t y l l f t j z i l j z p o i b o n ?



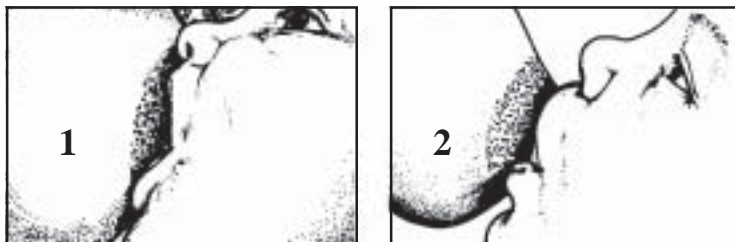


can lead to septicaemia (bacteria in the blood) and death. Common causes of post-partum fever include endometritis, malaria, chest infection, urinary tract infection (UTI) and mastitis (breast tenderness).

**High blood pressure:** any

problem with consciousness or headache should lead to a blood pressure check before discharge.

**Anaemia:** pale conjunctiva, pale tissues are signs of anaemia. Such women should be checked for blood loss and treated appropriately.



(Fig. 18) Breastfeeding technic (1) correct, (2) incorrect

**First urine:** encourage the mother to drink plenty of fluids and ensure that she has passed urine normally and not gone into urinary retention.

**Breastfeeding:** successful initiation of breastfeeding is a key factor to child survival in developing countries. Mothers

## Breastfeeding

A healthy baby if given the opportunity will start sucking at the breast 15-30 minutes after delivery. This and every consecutive time the child sucks the nipple will stimulate the release of milk secretion hormone, *prolactin*, and the hormone contracting the uterus named *oxytocin*. Even though it might take 2-3 days to have a good supply of milk the mother should give the breast whenever the child shows he/she wants to suck. The sucking technique is important. The birth attendant or nurse should show the new mother how to breast-feed the baby.

Foods other than breast milk (sugar water, honey) can cause diarrhoea and death in newborns. There is no type of formula milk that can replicate the protein, sugars and antibodies that are contained in colostrum (the first-milk). Once the baby has started sucking it should be given the breast on demand. Usually the mother and baby develop a fairly regular schedule after some days. The child will cry whenever the stomach is empty which is usually 2-3 hours after a meal. This time is needed for the breasts to be filled. If breastfeeding runs smoothly additional food is not required until the baby is 4-6 months of age and breastfeeding should still be continued preferably for 2 years.

Most women on the border get advice from their mothers or female relatives on breastfeeding but the birth attendant should not rely on this. It should be confirmed that breastfeeding has been established before the care of post-partum women is completed. Primigravid women (women with their first baby) usually need more help than other women. Women who have premature or small for dates (growth retarded) infants may also need extra attention.

*Remark: Beri-Beri is common in only breastfed babies and may cause death. Certainly in the camps and in other areas on the border where the diet is similar (rice and fish paste as the main food) thiamine (B1) supplementation should be part of the normal diet of breast feeding women.*



jrš lvi & ełvt ylon? a& rsm; pñ aom ubł r on fOrful  
 aym lap ył/ rłzñ; ył aem ul vlyacgi fa& m\* geš fygwbuł  
 jy \ emjz pfcif rsm; avsm lusoñ; apon?

**aumi faumi fpm; yg**

uav; rłzñ; yłbc seł a oł oł eł jci f; jz p yñ; clygu  
 uav; rłzñ; yłbc seł vł f t [ m& jz p a paom t pm;  
 t p m rsm; pm; & ełvt ylon? of f g v eš h a z m v p f t ul  
 p p l' g w l r s m; a o m t o m; u b l a o m t p m; t p m/  
 t x l o j z i h u u f t o n f o n f a [ r l v l i f ( a o l q m f  
 e l l m i j c, ) t j r e f y e l v n f y n h a p & e f j y k v l y a y; e l l o n?  
 t r # ( t & l u ) e s h t o d r s m; o n f v n f O r f a y s n a y m b o ñ;  
 a p & e l t w l u f t a & ; u b o n?

**aumi faom wpluł & nbeł s r\_ o e l s f p h a e y g**

r d i r s m; u l l v u a q; a u m j c i f o n i t a & ; j u d a u m i f  
 & s f v i t p ñ & s f j y a j m q l y g r d i e l w l u b a u ; r e s h  
 t i f o m o ñ; y d w l l o l [ k v i u a v; O r f a q; a u m a y;  
 y d w l l v u r s m; u l l a q; a u m o i l o n? a r g u i t p  
 u a v; e s h u a v; r d i o n i w p a e v p t c g a & c d l & e l v l  
 t y o n? t x l o j z i h t p k v t j y l o l [ k v i a r e z ñ; & e f  
 p t l y j z w t c f c i r s m; t m; j y e l v n f j l y i c s t y c l y g u  
 a y g i f e u m; u l l r e f e a q; a u m & e l v l t y o n? y a d' i f  
 y l o w l a q; j z i h a q; a u m j c i f r s m; - r d i o n i f  
 a & a m x m; a o m y a d i f y l o w l a q; & n f z i f a q; a u m r\_  
 j y l & m w d i f q l i f a q; & n h a y; x l l h y d / a y g i f e u m; u l l  
 n i b m e l n p ñ a q; a u m j c i f o n f a m \* g u l p u f c i f u l l  
 u m u g & m Y u l h a y; o n?

**yxrqłbñ; aom Orf**

r d z ñ; & m w d i f v l y a c g i f a & m \* g o n i y g o i l e y f  
 a x e l l o n? v u b n b n f r d z ñ; & m w d i f q l i f w l t m;  
 r s v i o m; x m; y g u o l w e p d i t u l t r d i e s f a q f a e l w i l y i f  
 o i l o n? r d z ñ; y d p t r d o r d r s m; o n f a & r s m; j y m; p ñ  
 ( w p a e o l l v l w m r s i g v l w m ) a o m u l e l v l t y f y d /  
 t r # e s h t o d r s m; j y m; p ñ p m; & e l v l t y o n? q l i f t & m  
 r s m; o n f O r f a y s n a e a p & e f u l h y d / v l y a c g i f a & m \* j z p e l l f  
 a c s u l l a v s m l u s a p o n?

**t & n f s m; r s m; y l l a o m u l y g**

r d z ñ; y d r d i r s m; o n f o l w l e u l l l w l l f u s e f r m a & e s h  
 e l l n x l w l v l y & e f o l w l e t & n f v u c h a o m u f o l r u l l

**r d i f u e f r m a & ; y n m a y;**

r d z ñ; y d / u s e f r m a & ; X m e , l e p i r s r x l u f e r ñ  
 t r d o r d w i l l f u s e f r m a & ; y n m o w i f t c u l t v u r s m;  
 t v l t a v m u l t j y n h t p k & l b ñ; o i l o n?  
 r d z ñ; y d p t r d o r d r s m; t m; r e l u e p h j y l p a p m i h  
 a & ñ u j c i f o n i r d i a o q l r \_ t a & t w l u l u l u s q i f  
 a p e l l o n?

**z c i f y d i f y g w b u b e j c i f**

t r d o r d r s m; . r d y ñ; r q l l & m u s e f r m a & ; o n f a , m u s ñ; . p i v d i p m; r e s h y d i f y g w b u f w f r e l w / u f & b n?  
 a , m u s ñ; . a p m v # p ñ y t a y g i f a q m i & l u r o n i a r g p u a v; e s h u l l D e l a q m i f u s e f r m a & ; t w l u f  
 r & j z p l v t y o n? z c i f . y d i f y g w b u r o n f u l l D e l a q m i p o l u w n f u j z p & r n f [ k t m; v l l a o m  
 t a w e t u l r s m; u j y o o n? t r d o r d r s m; o n f o l w l e v i a , m u s ñ; r s m; u l l r d z ñ; & m o l e a c; a q m i v m & e f  
 p l v f t m; x u b e b i h y d / a r c e f x l w i f o l w l t w l u f a e m t q i b i f j y k v l y x m; a y; o i l o n?



should be encouraged to breastfeed their babies since birth.

### **Good hygiene - keeping clean**

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The importance of hand washing should be explained clearly to mothers. Before breastfeeding and always after going to the toilet or looking after the baby's stools, the hands should be washed. Newborns and their mothers need a daily bath. The perineum needs regular cleaning especially if a tear or episiotomy has been repaired. Povidine baths where the mother makes a dilute bath with povidine, sits in it, and gently cleans the perineum can help prevent infection.

### **Drink more fluids**

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Post-partum mothers need to increase their intake of fluids to keep themselves healthy and to help with milk production. Drinking a lot of water also helps to keep



the stools softer which reduces problems with haemorrhoids after delivery.

### **Eat well**

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Nutritious foods are needed post-partum particularly if there has been a post-partum haemorrhage. Foods rich in iron and folate such as meats, especially chicken liver can lead to a more rapid recovery of haemoglobin. Fibre and fruit are also important to maintain soft stools.

### **First stool**

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Delivery can be complicated by haemorrhoids. If these are noted at delivery by the birth attendant, their management should be discussed with the mother. Post-partum women need to drink a lot (3-5 litres per day), and need to eat plenty of fibre and fruit. These things help to keep the stool soft and reduce the chances of haemorrhoids.

### **Maternal Health Education**

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Before leaving the health unit after delivery every woman should have received adequate information on hygiene, breastfeeding, family planning and care of the newborn.

Proper caring of the post-partum women can reduce the number of deaths of mothers.

#### **Involving the father**

Improvement in the reproductive health of women is dependent on the interest and involvement of the husband. His co-operation from early on is vital for good neonatal and maternal health. All experience indicates that the involvement of the father must be initiated during pregnancy. Women should be encouraged to bring their husbands to delivery and a place should be made available for them in the delivery room.



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 o l y g u u h e l l o n ?

# Nutrition Education for a Healthy Community

## Preventing Nutrient Deficiencies

Andrea Menefee, BBC



*We eat foods not only to satisfy our hunger but also to provide nutrition and energy to the body. This article will briefly discuss the various nutrients needed for our body and what happens if they are not enough to meet the requirement of the body.*

Every person needs to eat foods that contain these nutrients in order to stay healthy, energetic, and strong.

The nutrients are:

1. carbohydrates (sugars, starches, fiber)
2. protein
3. fat
4. vitamins
5. minerals
6. water

All foods contain a combination of nutrients - some foods have more of some nutrients than others. For example, meat has a lot of protein, but also has fat, vitamins and minerals. Rice is mostly carbohydrate, but also has some protein and important vitamins.

Carbohydrates, proteins, and fat are all nutrients that build the body and provide energy. Carbohydrates give us energy to do all the things we need to do every day, like walking, talking, sleeping, working, etc. Proteins build the body—muscles and tissues - and repair tissues. Fats provide energy and can be stored in the body for energy.



In some places in the world, it may be difficult for people to find foods that contain all the nutrients they need. Some foods might not be available to them, or because they do not have money, or because some foods that people like to eat are naturally low in certain nutrients. This may eventually cause nutrition deficiencies in people.

**Nutrient deficiency:** a condition resulting from the body not having enough of one or more of the nutrients necessary to function.

Most nutritional deficiencies are easily prevented. Teachers and health workers can help by knowing which nutritional deficiencies people will be most likely to get in their community, what the basic signs and symptoms are, and how these deficiencies can be prevented.

**Nutrition:** the science of food and its function in the body.

**Nutrients:** the part of food which the body uses:

- To build and repair tissues
- To produce energy
- To stay healthy



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(Fig. 19) Vitamin A Deficiency: Bitot's spot.

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**Protein-energy malnutrition:** in some parts of Asia, protein-energy malnutrition (PEM) is a big health problem. This happens when people, usually younger children, do not get enough food to eat or are ill very often. They may become very thin, weak, have more infections and illnesses, and their growth may slow down or stop totally. PEM can cause death if it is severe enough.

PEM is measured by checking a child's weight and height and comparing them to standards. In the camps, these checks are usually done in the MCH clinic every month, and the growth chart is used.

This type of malnutrition is treated by making sure the child has enough food to eat (eg. supplementary feeding or therapeutic feeding), treating any infection, and teaching parents the best foods to feed their young children.

**Vitamin and mineral deficiencies:** vitamins and minerals are nutrients that the body needs only in very small (trace) amounts. Vitamins and minerals do NOT provide us with energy, like carbohydrates, proteins, and fat, but they each have specific and important functions in the body.

The most common deficiencies or risk of deficiencies in this region (Thailand, Burma) are from vitamin A, vitamin B1 (thiamine), and iron (a mineral).

**Vitamin A:** The body needs vitamin A to prevent infections, to keep the eyes healthy and to help children grow properly.

Vitamin A helps to keep healthy the cells of the surface of the body (eg. skin), as well as cells that line our gut and respiratory tract, the surface of the eye; inside the mouth; the lining of the gut and respiratory tract.

Vitamin A helps to keep the eyes wet and the eye surface strong and clear. It also helps us to see in dim (dusk time or candlelight) light.

It helps to keep cells on the surface of the body healthy so that bacteria and viruses cannot enter the body and make us sick.

It helps children grow – without it, they do not grow to their full potential.

Pregnant and lactating women also need vitamin A for the growing fetus and so the breastfeeding baby will receive it in the milk.

## **Signs and symptoms of deficiency**

**Young children are most susceptible to vitamin A deficiency.** If a child does not get enough vitamin A, he/she can go blind. Vitamin A deficiency also increases risk and duration of infection, and children who are deficient in this vitamin are more likely to die from a measles attack.

The first sign of vitamin A deficiency is night blindness – difficulty in seeing in dim light. A child with this sign will be afraid to walk around and play during dusk time or in candlelight.

### **Prevention messages**

- **Eat plenty of foods that contain vitamin A (and be sure to feed to children)**
- **Go to clinic on schedule for vitamin A capsules**
- **Breastfeed children**

To help the body use vitamin A in foods, cook and eat them with a little bit of oil. Do not overcook foods until burnt or crisp, since this makes the vitamin A disappear.

When the deficiency gets worse, the child may have wrinkled, foamy or brown spots on the white part of their eyes. Later, they may get an ulcer on the cornea (the brown part of their eye). At this point, it is very easy for them to go blind.



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**Vitamin B:** there are many kinds of B vitamins. The B vitamins are important to help the body use the energy foods (carbohydrates) that we eat. The more carbohydrates we eat, the more B vitamins we need. Deficiency of vitamin B<sub>1</sub> (thiamine) causes 'beriberi', a disease that may turn fatal if not taken care of.

Vitamin B<sub>1</sub> is important for the proper function of our nervous system. Rice contains vitamin B<sub>1</sub>, but unfortunately, the vitamin is mostly on the hull (husk or outer covering) of the rice. Most of the vitamin gets wasted when the rice is milled and polished. People who eat polished rice are



*Wet beriberi*

more at risk for vitamin B<sub>1</sub> deficiency. So, in a culture that eats large amounts of rice there is more chance of acquiring thiamine deficiency.

### Signs and symptoms of deficiency

More often, people will have symptoms of mild B<sub>1</sub> deficiency, including:

- Loss of appetite
- Weakness or aching in the legs
- Burning sensation, tingling or numbness in hands and feet

The symptoms of mild B<sub>1</sub> deficiency can go unnoticed and there is NO easy test to be sure. It is important to know that symptoms will improve with administration of vitamin B<sub>1</sub>.

More severe B<sub>1</sub> deficiency, called beriberi, will have more dangerous signs and symptoms, including:

- Very weak muscles, wasting of muscles, loss of sensation in feet, poor reflexes ('dry' beriberi)
- Oedema, cardiac problems ('wet' beriberi)

Beriberi is especially common in pregnant women and lactating mothers and their babies.

Vitamin B<sub>1</sub> is destroyed by betel nut, tea and coffee – so if you chew betel nut and drink tea and coffee – do it between meals, not during or just before or just after having a meal.

#### **Prevention messages**

- Eat foods with vitamin B<sub>1</sub>.
- Avoid chewing betel nut close to meal times, and drinking coffee and tea during meals.
- Wash rice only 1 or 2 times, and use the cooking water for drinking or cooking later.
- Do not store vegetables for a long time before eating, and cook vegetables very short time to preserve the vitamins.
- Pregnant and lactating women should take all supplements provided by MCH clinic.



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**Iron:** Iron is a mineral found in small amounts in foods. It is important for healthy blood and oxygen transport to the cells. Cells need this oxygen to ‘burn’ carbohydrates and fat for energy.

The body uses iron to:

- Make hemoglobin for red blood cells – hemoglobin carries oxygen in the blood to all the cells in the body
- Help other cells to function
- Replace worn out or lost red cells build new tissue

Iron-deficiency anemia is the most common nutritional disorder in the world. Pre-school children and pregnant and lactating women are most susceptible to iron deficiency, since their needs for iron are highest.

Iron is a difficult nutrient to get from foods, since most foods only contain a small amount. The body only absorbs part of the iron in foods – most of it goes out in the faeces.

Iron in animal foods like meat and eggs, is more easily used by the body. Iron in plant foods like beans and vegetables, is harder for the body to absorb. If people do not eat

### Prevention Messages

- Eat foods with iron in them
- Eat vitamin C foods at the same time as iron foods (eg eat fruits, like orange, lime, or vegetables, like tomatoes, peppers, pumpkin)
- Do not drink tea or coffee during meals – wait for several hours at least

much meat, they are more at risk for iron deficiency.

Some foods help the body to absorb iron – these are high vitamin C foods, like lime, roselle, guava, pumpkin, tomatoe, etc. These foods should be eaten with iron foods.

Some foods interfere with iron absorption, which include coffee and tea. They should be avoided at mealtimes.

### Signs and symptoms of anemia

- Weakness
- Fatigue (tiredness)
- Pale skin, pale nail beds, pale conjunctiva
- Low hemoglobin or hematocrit from blood testing

## MAIN MESSAGES ABOUT NUTRITION AND HEALTH

### **Eating a variety of foods every day is the best way to prevent nutrient deficiencies**

- Try to eat a variety of foods every day in addition to rice, including beans or nuts, fresh fruits and vegetables, and meat and eggs if available.
- Children need plenty of protein foods and fresh fruits and vegetables to grow properly.
- All people should try to eat some dark green leafy vegetables, yellow and orange fruits and vegetables, and every day.
- All people should try to eat some meat or use lemon or other vitamin c foods when you eat so the body will get more iron.
- Betal nut, coffee and tea destroy some vitamins and minerals. Do not eat them close to meals.



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# Sanitation and Waste Management in Nu Po Camp

Nipaporn Intong, ARC



*Everyday in the camp a good amount of garbage is produced from various sources. To maintain a clean and healthy environment, proper disposal of garbage is necessary. This article will describe how the sanitarian workers are handling the garbage disposal in Nu Po camp.*

Everybody living in the camps knows right away that sanitation refers to latrine construction, safe water supply, wastewater management and garbage disposal. These activities are important for ensuring a safe environment and reducing the incidence of environment-related diseases.

In Nu Po camp, with the efforts of ARC sanitation programme (ARC-SAN) the percentage of families owning and using their own latrines is closed to 100 %. The statistics revealed by Saw Lah Lay - a current supervisor of the program - showed that 92% of total households have their own water-sealed latrines; 6% have pit latrines and only 2% share their latrines with others. Latrine maintenance and cleanliness are areas of improvement for the program. If latrines are not clean and well maintained, they will become a breeding site for flies and other disease vectors and produce bad smell. The supervisor said that about 60% of total households keep their latrines clean and well-maintained, only 40% require more attention by the programme for improvement.



However, today the main concern for SAN is the garbage disposal. Since the camp started setting up markets, the volume of garbage has been rising. Especially plastic bags disposal is a problem. When burnt, these bags emit bad odor and toxic fumes. In addition, there is no suitable place to burn plastic waste. Moreover Nu Po camp is located in a forest preservation area, and burning plastic waste can have a harmful impact on wild life and forest environment. Previously SAN has disposed of the plastic waste by filling lands in the camp particularly the low-lying areas. Due to the limited size of the camp, this activity had to be stopped and the plastic waste kept piling up everyday.

From 1999 Sah Moo Thaw, a previous supervisor of SAN program asked the refugees to separate their household garbage (wet, dry, and plastic). They were all instructed to put the plastic waste in a big plastic bag provided by SAN, then to return the full bag to SAN and get a new bag. All



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ARC refugee staffs were asked to participate in this activity to motivate and involve the community. During 1999-2000, SAN collected an average of 129 kg of plastic waste per month. In 2001, SAN now collects almost 530 kg of plastic waste per month.

Reuse and recycling of waste were introduced in the camp. Wet garbage and some dry garbage such as fallen leaves, paper, dry grass, and wet vegetable peels are collected and burnt in each section in rubbish holes. The ashes are used in the gardens. Some of the wet garbage is used for making organic fertilizer. The plastic garbage is reused for making ropes, rubbish bins, sky light sheets and water container for toilets. The distribution of cooking oil in small plastic bottles provided by BBC, creates a big pile of solid waste in the camp. These discarded bottles are being collected to make fence around ARC compound. This idea has been adopted by the community. Refugees now collect the cooking oil bottles and make their own fences around their houses. This activity saves the use of bamboos for making fences. SAN discussed with BBC in order to provide bigger bottles (20 liters-bottle) of cooking oil to the refugees. The refugees

can reuse the bigger bottle for collecting oil during the next distribution. All these efforts help to solve waste disposal problems in Nu Po camp.

Moreover, SAN is now concerned in saving energy and protecting the environment. The solar cooking stove was experimented and became a success. Solar stove can be used to boil water and cook rice. Twice, trainings on making solar stove were provided and attended by 38 participants. These activities are undertaken to reduce charcoal use and stop tree felling. Now, SAN plans to install filtered water tanks in all the sections of the camp to provide clean drinking water.

For Saw Lah Lay, the ability to solve solid waste disposal problems in Nu Po camp depend mostly on recycling and the ability to convert most of the camp's waste into reusable materials. He recommends all refugees along the border, to find solutions for recycling and protection of the environment, to make the camps a clean and healthy place to live. According to Saw Lah Lay "*All healthy practices should not only be used when we live in the camps, they should be brought back to our motherland in the future*".









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- a q m i l y g w y k i . t " y g f
- a c j f p o h a & f c s , j c i f /
- a q m i l y g w l y d i f a o m t c s u f t v u r s m ; /
- O g u s v n h a q m u l y l l
- o & l y a z : y l l o l l y l c i f E S f o & l y a z : y l l s m ; u p m z w f  
o r s m ; e m ; v n f a b m a y g u a t m i r n b o l u h y l l
- u m w e f / o u q l l l r m a ' o r s m ; r s t j z p l t y s u r s m ; a & ;



y l l ( 2 4 ) t v l y l l q a E y l l t z h ( r h c j i t )  
 ( Fig. 24 ) Working group in Mae Kong Kha

- o m ; j c i f / a & m \* g t a j c a e a v o m j c i f / a & m \* g . a e m u f  
a = u m i f Z p j r p f a w e q h r ; j r e f j c i f /
- a w e q h r ; j r e r w c k j y l y l j c i f /
- a w e q h r ; j r e f r t a y : t a j c h l p m a & j c i f /

t v l y l l q a E y l l r s m ; w l f a [ m a j m y l e j c i f E S f  
 u l l l w l l y d i f v l y a q m i f c i t e n f p l e p r s m ; u l l j y k  
 v l y t c h u y j o n ? a q m i l y g a & ; m w l f v u l a w e l y f  
 a q m i r w c j z p a p & e f t p k l u h a & ; o m ; j c i f u l l j y k v l y t c  
 u o n ? t p k l u h a & ; o m ; j c i f u l l y l l t m ; a y ; c h u y j o n ?  
 & v ' l w c r h y d i q i E u o r s m ; o n f r \* Z i f z w & m  
 w l j u l u E s b o u f u o u o l p m a & j c i f t w w l y n m E S f  
 y w b u b n h a q a E y l l r s m ; w l f y d i & o n l u l v n f  
 a y s m & s f u j y d y l l o i f , M u a u m i f a w e y o n ?  
 t j c m ; w z u f s u n l v # f p m z w l w l t a u m i f y l l o &  
 j c i f o n f p l w f t m ; w u l l u e g f c e f t m ; w c j z p l l  
 p m z w l o r s m ; E S f e y l l & i f E d i t r i r / e m ; v n r r s m ;  
 & v m c h u y j o n ? p c e f r s m ; w l f v l y a q m i a e r r s m ; E S f y w f  
 o u l l w o l w a , m u t s i f . x i j r i f , l q s u b E l l r s m ;  
 a z : x l w E l l B e f t w l u f , l u o h o m t v l y l l q a E y l l r s m ;  
 u l l t c e f r e f f j y k l y a y ; o i y o n ?



y l l ( 2 5 ) t v l y l l q a E y l l ( r & r m v l l )  
 ( Fig. 25 ) Workshop in Mae Ra Ma Luang





# The Dangers of Self-medication

Dr. Arnaud Jeannie, MSF, Mae Sot



*Unprescribed medicines are sold in every market. In Mae La, the number of shops selling tablets, ointments and sometimes injections is certainly over the dozen. These drugs are mostly of unknown quality, costly and very often prescribed by untrained shopkeepers. These drugs can have dramatic effects on people's health. This story demonstrates how their use has impaired someone's life, induced resistance in the environment and lead to unnecessary costs.*

Ms H., a 36 years old trained laboratory technician, experienced some pain while urinating. She diagnosed herself as having urinary tract infection (UTI). She could have gone to the camp clinic where the diagnosis would have been confirmed and treatment dispensed for free. But, she felt that the waiting queue was too long at the OPD. So she went to the shop and bought some well-known purple packets. Each pack usually contains 125 mg of Amoxicillin. This drug is one of the possible treatments for UTI. But it is effective only if 1500 mg is taken per day for at least 7 days. But the shopkeeper recommended Ms H. to take 3 packets a day for 3 days. That is only 375 mg a day. After some improvement, she felt the pain returning. By the second day of the relapse, she had fever and had low back pain. She waited another day.

When she arrived at the OPD, pyelonephritis (infection of the kidney) was diagnosed at once. She was sent to the IPD to receive intravenous Amoxicillin. For 48 hours she suffered from severe pain and high fever. By the third day of treatment, she improved. But by the fourth day, fever and pain were back again. It seemed that, the bacteria causing the infection was resistant to Amoxicillin. That is because she took small amount of the medicine for a very short period, so the quantity of antibiotic in her urine was not enough to destroy all the

germs, and the ones remaining were not sensitive to Amoxicillin.

We had to treat her with IV Ceftriaxone for 5 days. We do not know what was the cost of the purple packets but it was certainly not very cheap. The cost of the treatment for cystitis (infection of the bladder), Amoxicillin tablets for 7 days is 60 Baths. The Ceftriaxone treatment cost 600 Baths, 10 times more. The risks of pyelonephritis complications include death by septic shock, but also chronic nephrotic syndrome.

What we get from this story is that whoever takes drugs without proper prescription, put his/her life into danger. This may also reduce the efficacy of cheap drugs. People spend money from their own pockets for self-treatment and eventually induce higher costs for the medical NGOs providing health care.

**DON'T TAKE MEDICINE WITHOUT A MEDIC'S KNOWLEDGE.**

**DON'T TREAT YOURSELF OR YOUR FAMILY MEMBERS WITHOUT CONSULTING A MEDIC.**

**ALWAYS COMPLETE THE FULL-DOSE OF THE MEDICINE EVEN IF THE SYMPTOMS SUBSIDE.**

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