

DIARRHOEA MANAGEMENT

Ques.1 - What is Diarrhoea?

Ans. -The number of stools normally passed in a day varies with the diet and the age of the child. In diarrhoea, stools contain more water than normal — they are often called loose or watery stools. A child has diarrhoea if he/she passes three or more watery stools per day. Diarrhoea makes child's condition vulnerable by draining liquid from the body thus dehydrating the body.

Note: Babies who are breastfed often have stools that are soft; this is not diarrhoea.

Ques.2 - Why is diarrhoea dangerous?

Ans. -Diarrhoea when uncontrolled may lead to malnutrition, dehydration and ultimately death. Since nutrients are lost from the body in diarrhoea as there is lack of appetite in the child. Mothers may not feed children milk while they have diarrhoea, as the lactose in the milk may not be tolerated by the intestines and a condition known as lactose intolerance develops which may further aggravates the diarrhoea. Death from acute diarrhoea is most often caused by loss of a large amount of water and electrolytes from the body. This leads to dehydration.

Ques.3 - How are diarrhoea pathogens (infection causing agents) transmitted?

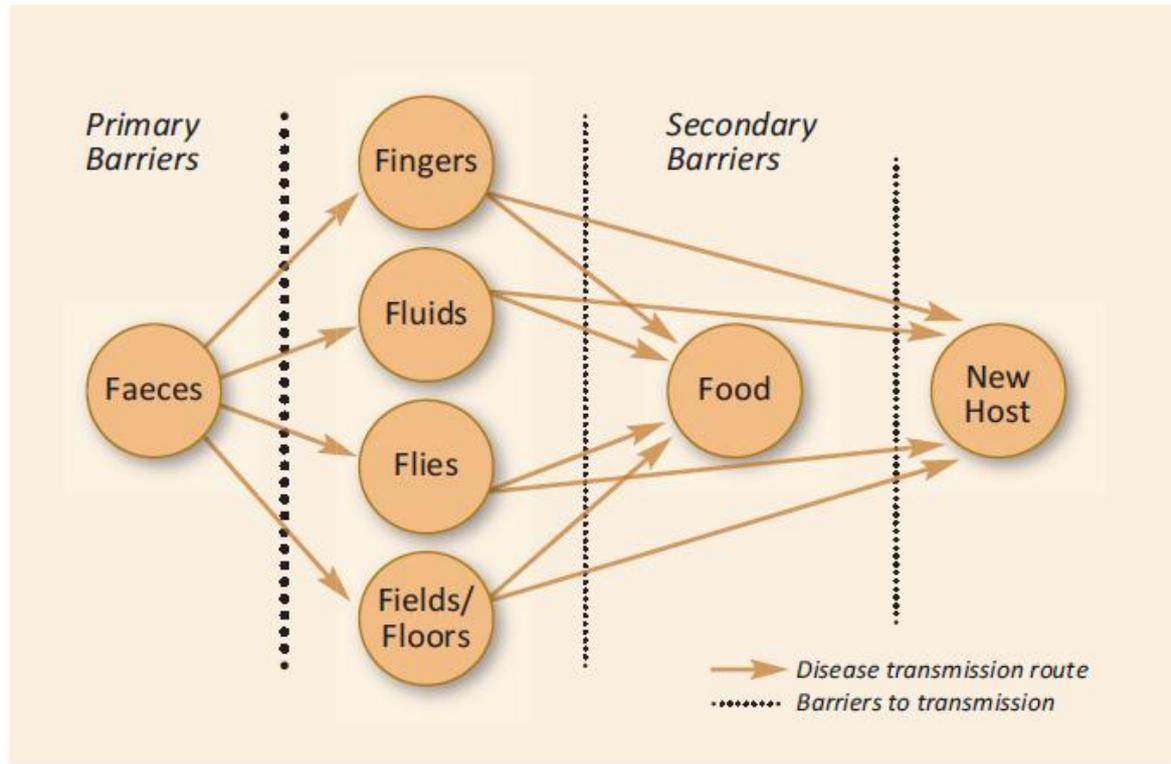
Ans—In Diarrhoea the origin of the pathogen is through the excreta (stool) of the infected person. The “faecal-oral cycle” describes the main routes of transmission of infectious diarrhoeal disease/pathogen.

This cycle is run by the “five f’s”:

- fluid (drinking contaminated water);
- fields (the contamination of soil and crops with human faecal matter);
- fingers (unwashed hands preparing food or going into the mouth);
- food (eating contaminated food);
- Flies (spreading disease from faeces to food and water or directly to people – particularly problematic where open-air defecation is common).

This faecal-oral cycle can be interrupted by following good hygiene practices like: washing hands with soap - after defecation; before cooking food; before feeding the child and by using covered toilets or latrines etc.

The F-diagram of disease transmission and control (after Wagner & Lanoix)



Source: Jamie Bartram, Coordinator Assessing and Managing Environmental Risks to Health, World Health Organization, Geneva, Switzerland,

Ques.4 – What are the causes of Diarrhoea?

Ans -

Causes of Diarrhoea

- **Malnutrition:** Children who die from diarrhoea often suffer from underlying malnutrition, which makes them more vulnerable to diarrhoea. Each diarrhoeal episode, in turn, makes their malnutrition even worse. Diarrhoea is a leading cause of malnutrition in children under five years old.
- **Bottle feeding:** feeding with bottle is not considered safe since it is difficult to completely sterilize the bottle every time it is used and thus it becomes a source of infection for the child, posing threat for the child.
- **Bacterial/Viral infections:** Diarrhoea is a symptom of infections caused by a host of bacterial, viral and parasitic organisms, most of which are spread by faeces-contaminated water/food. Infection is more common when there is a shortage of clean water for drinking, cooking and cleaning. Rotavirus and Escherichia coli are the two most common causes of diarrhoea.

- **Unsafe drinking water** - Water contaminated with human faeces, for example, from sewage, septic tanks and latrines, is of particular concern. Animal faeces also contain microorganisms that can cause diarrhoea. In villages people often use the same water for drinking and cooking purposes, in which they bathe their animals and wash their clothes and utensils.
- **Lack of personal hygiene:** Diarrhoeal disease can also spread from person-to-person, aggravated by poor personal hygiene.
- **Unhygienic feeding practices:** Food is another major cause of diarrhoea when it is prepared or stored in unhygienic conditions. Germs causing diarrhoea occur in dirty & unhygienic conditions.

Source: <http://www.who.int/mediacentre/factsheets/fs330/en/index.html>

Ques.5 – What are the general symptoms of Diarrhoea?

Ans. Diarrhoeal episodes may be accompanied by following general symptoms:

- ✚ Watery stools are frequently passed
- ✚ Vomiting, fever and abdominal pains
- ✚ Urine is dark and output is reduced
- ✚ Wrinkled skin with muscle cramps
- ✚ The soft spot on the head is sunken
- ✚ If the skin is pinched it regains its original shape slowly.
- ✚ The eyes are sunken and dry
- ✚ Breathing is deep and rapid

Though most episodes of childhood diarrhoea are mild, acute cases can lead to significant fluid loss and dehydration, which may result in death or other severe consequences if fluids are not replaced at the first sign of diarrhoea.

Source: Facility Based Integrated Management of Neonatal and Childhood Illness Participant Manual ,MoHFW, GOI, 2009

Ques.6- What are the different forms of diarrhoea in childhood?

Ans -There are three main forms of acute diarrhoea, all of which are potentially life-threatening and require different treatment courses:

Acute Diarrhoea	Persistent Diarrhoea	Dysentery
✚ If an episode of diarrhoea lasts less than	✚ If the diarrhoea lasts 14 days or more, it is	✚ Diarrhoea with blood in the stool, with or

<p>14 days, it is acute diarrhoea.</p> <ul style="list-style-type: none"> ✚ The pathogens that generally cause acute watery diarrhoea include <i>V. cholerae</i> or <i>E. coli</i> bacteria, as well as rotavirus. ✚ Acute watery diarrhoea causes dehydration and contributes to malnutrition. ✚ The death of an infant with acute diarrhoea is usually due to dehydration. 	<p>persistent diarrhoea.</p> <ul style="list-style-type: none"> ✚ Up to 20% of episodes of diarrhoea become persistent. ✚ Persistent diarrhoea often causes nutritional problems and contributes to deaths in children. ✚ Undernourished children and those with other illnesses, such as AIDS, are more likely to develop persistent diarrhoea ✚ Persistent diarrhoea accounts for up to 15 percent of all episodes of diarrhoea but is associated with 30 to 50 percent of deaths. ✚ Persistent diarrhoea is uncommon in infants who are exclusively breast-fed. 	<p>without mucus, is called dysentery.</p> <ul style="list-style-type: none"> ✚ The most common cause of dysentery is <i>Shigella</i> bacteria. ✚ It is associated with intestinal damage and nutrient losses in an infected individual. ✚ It is usually associated with fever, abdominal cramps & rectal pain.
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- All young infants with diarrhoea lasting for 14 days or more are considered 'severe' cases and are classified as having SEVERE PERSISTENT DIARRHOEA.
- All young infants with persistent diarrhoea should be referred to hospital.
- As a rule, treatment of dehydration should be initiated first, unless there is another severe classification.

Ques.7 – What is the leading cause of Acute Diarrhoea?

Ans -Rotavirus is the leading cause of acute diarrhoea, and is responsible for about 40 per cent of all hospital admissions due to diarrhoea among children under five worldwide. The primary mode of transmission is via fecal-oral route. Because the virus is stable in the environment, transmission can occur through ingestion of contaminated water or food and contact with contaminated surfaces or objects.

Source:(<http://www.cdc.gov/rotavirus/clinical.html>)

Source: Students' Handbook for IMNCI Integrated Management of Neonatal and Childhood Illness, Ministry of Health & Family Welfare, Government of India, 2003

Ques.8 - What is dehydration?

Ans. -The most severe threat posed by diarrhoea is dehydration. During a diarrhoeal episode, water and electrolytes (like sodium, chloride, potassium and bicarbonate) are lost through liquid stools, vomit, sweat and urine. Dehydration occurs when these losses are not replaced by adequate fluid intake.

Source: http://whqlibdoc.who.int/publications/2007/9241594942_eng.pdf

As a general thumb rule, depending on the signs and symptoms of dehydration the degree or extent of dehydration can be rated on the following scale of three:

Early dehydration –	No signs or symptoms are seen.
Moderate dehydration:	<ul style="list-style-type: none">+ thirst+ restless or irritable behaviour+ decreased skin elasticity+ sunken eyes
Severe dehydration:	<ul style="list-style-type: none">+ symptoms become more severe+ Shock, with diminished consciousness, lack of urine output, cool & moist extremities, a rapid but feeble (weak) pulse, low or undetectable blood pressure and pale skin

Death may follow severe dehydration if body fluids and electrolytes are not replenished, either through the use of oral rehydration salts (ORS) solution, or through an intravenous (IV) drip.

Depending on the degree of dehydration, specific and tailor-made medical and nutritional therapy may be initiated by the paramedical staff.

Ques.9 - How is diarrhoea with mild dehydration treated?

Ans. –

- First the amount of ORS to be give during the first 4 hours should be determined.
- The approximate amount of ORS required (in ml) can also be calculated by multiplying the child's weight (in Kg) by 75.

- If the child wants more ORS than prescribed, then the child may be given more.
- In addition to giving ORS, the mother should be encouraged to breastfeed during first 4 hours of dehydration. If baby has low weight or signs of sepsis, the infant should be given antibiotics as for cases of sepsis.

Ques.10 - How is diarrhoea with blood in stools treated?

Ans. - A child with blood in the stools should be treated for dehydration and Shigella infection.

Children with severe dehydration and/or severe malnutrition should be admitted to the hospital and treated immediately for these problems. The mother can be advised for proper home management of diarrhoea, same as mentioned for children with no or some signs of dehydration.

Ques.11 - How diarrhoea causes dehydration?

Ans. The body normally takes in the water and electrolytes it needs through various fluids and food. Electrolytes and water are absorbed in the body and excreted through stool, urine and sweat for maintaining the fluid and electrolyte balance of the body. When the intestine is healthy, water and electrolytes pass from the intestines into the blood. Whereas, during diarrhoeal episodes the activity of bowel is altered. Less water and electrolytes pass into the blood, and more pass from the blood into the bowel. Thus, more than the normal amount of water and electrolytes are passed in the stool. **This larger than normal loss of water and salts from the body results in dehydration.** The more diarrhoea a child has the more water and electrolytes he/she loses. Dehydration can also be caused by a lot of vomiting, which may often accompany diarrhoea.

Ques.12 - Why infants and children below 5 years are more vulnerable to dehydration/fluid loss?

Ans -Children are at a greater risk of dehydration since water constitutes a greater proportion of children's body weight. Young children use more water over the course of the day given their higher metabolic rates, and also their kidneys are less able to conserve water compared to older children and adults.

Newborn infants are at an increased risk of infection due to their deficient immune system in other words infants' immune system is intact but immature at birth.

Undernourished children may have increased susceptibility to infections because of its negative impact on the barrier protection, predisposing the child to frequent episodes of illness and longer recovery period.

Eating outside food and indulging in unhygienic practices while feeding the child may risk child's life.

Therefore, great care should be taken as soon as signs of dehydration are noticed and recommended therapy must be initiated at the earliest.

Ques.13 - What is advised in case of severe persistent diarrhoea?

Ans. - If the young infant has diarrhoea for 14 days or more, the case should be considered and managed as a case of severe persistent diarrhoea.

Along with dehydration management and sepsis (infection) treatment, the mother should be encouraged to exclusively breastfeed the child.

As prescribed by the doctor, vitamin and mineral supplements can be given for at least 2 weeks.

Ques.14 - How diarrhoea is clinically assessed?

Ans. Assessment of all young infants with diarrhoea is based on:

- (a) signs of dehydration;
- (b) duration of diarrhoea;
- (c) Blood in the stool.

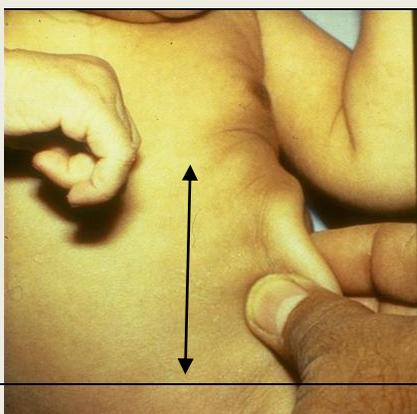
Following clinical signs can be used to determine the level of dehydration in infants with diarrhoea:

Infant's general condition-Depending on the degree of dehydration, an infant with diarrhoea may be lethargic or unconscious or look restless/irritable.

Note: Only infants who cannot be consoled and calmed should be considered restless or irritable

Sunken eyes - The eyes of a dehydrated infant may look *sunken*. In a severely malnourished infant who is visibly wasted, the eyes may always look sunken, even if the infant is not dehydrated. Even though the sign "sunken eyes" is less reliable in a visibly wasted infant, it can still be used to classify the infant's dehydration.

Elasticity of skin – The elasticity of skin is checked using the skin pinch test. After pinching the skin when released, the skin pinch goes back either *very slowly* (longer than 2 seconds), or *slowly* (skin stays up even for a brief instant), or *immediately*. In an infant with severe malnutrition, the skin may go back slowly even if the infant is not dehydrated. In an overweight infant, or an infant with oedema, the skin may go back immediately even if the infant is dehydrated.



Standard Procedures for Skin Pinch Test:

Locate the area on the child's abdomen halfway between the umbilicus (navel) and the side of the abdomen; then pinch the skin using the thumb and first finger.

Place your hand in such a way that when the skin is pinched, the fold of skin will be in a line up and down the child's body and not across the child's body. It is important to firmly pick up all of the layers of skin and the tissue under them for one second and then release it.

Source: Integrated management of neonatal and childhood illness. Assess and classify the sick young infant age upto 2 months Module-2

Ques. 15 - How can diarrhoea be prevented?

Ans - Interventions that work to reduce the number of diarrhoea cases are:

- Disposing of human excreta in a sanitary manner,
- Washing hands with soap,
- Increasing access to safe water,
- Improving water quality at the source,
- Treating household water and storing it safely.

Ques. 16 - What are the clinical signs of severe dehydration?

Ans. - A young infant with SEVERE DEHYDRATION has any two of the following signs: is lethargic or unconscious, has a sunken eye, or a skin pinch goes back very slowly.

Severe dehydration	Two of the following signs: <ul style="list-style-type: none">• Lethargic or unconscious• Sunken eyes• Skin pinch very slow
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Ques. 17 - How can severe dehydration be treated?

Ans. Treatment of severe dehydration:

In case of severe dehydration, along with the prescribed IV (intravenous) rehydration, ORS should be given as soon as the child can drink at the following rate:

Weight	Volume of ORS solution per hour
<4 kg	15 ml
4- <6 kg	25 ml
6 - <10 kg	40 ml
10 - <14 kg	60 ml
14-19 kg	85 ml

Source: Ministry of Health & Family Welfare, Government of India, New Delhi, 2009, World Health Organization, Unicef, Facility Based Integrated Management of Neonatal and Childhood Illness, Participant Manual

If possible, the infant may be observed for at least 6 hours after rehydration to be assured that the mother can maintain hydration by giving the child ORS solution by mouth.

Breastfeeding may be continued, if the child is able to take liquids orally.

Ques.18 - What are the clinical signs of some (mild/moderate) dehydration?

Ans. - A young infant with SOME DEHYDRATION have any combination of two of the following signs: restless/irritable, sunken eyes, skin pinch goes back slowly.

Some dehydration	Two of the following signs: <ul style="list-style-type: none">• Restless, irritable• Sunken eyes• Skin pinch slow
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Ques.19 - What is the home therapy to prevent dehydration and malnutrition, in case of diarrhoea with no signs of dehydration?

Ans. - Although these children lack distinct signs of dehydration, they should be given more fluid than usual to prevent dehydration from developing

Children with no signs of dehydration need extra fluids and salt to replace their losses of water and electrolytes due to diarrhoea. If these are not given, signs of dehydration may develop.

Following fluids may be given for recovery form diarrhoea:

- Breastfeeding should be continued
- Most fluids that a child normally takes can be given
- Home-made liquids like
 - ORS solution
 - Salted drinks (e.g. salted rice water or a salted yoghurt drink),
 - vegetable or chicken soup with salt,
 - plain water
 - water in which a cereal has been cooked (e.g. unsalted rice water)
 - unsalted soup
 - yoghurt drinks without salt
 - green coconut water
 - weak tea (unsweetened)
 - Un-sweetened fresh fruit juice.

Along with the home remedy, supplemental zinc (10 - 20 mg) may be given to the child, every day for 10 to 14 days (as prescribed by the doctor)

Ques. 20 – What is Oral Rehydration Therapy (ORT)?

Ans -

_ Oral Rehydration Solution is a life-saving fluid and is effective for all ages for replacement of fluid losses during diarrhoea.

ORS restores the normal electrolyte fluid balance of the body.

_ Oral Rehydration Salt (ORS) may be properly mixed with water as per the instructions to prepare a solution and given to the child during diarrhoeal episode.

Low Sodium ORS Solution (WHO)

A new formula for oral rehydration salts (ORS), has been released by the World Health Organization. The new formula ORS, a sodium and glucose solution. is widely used to treat children with acute diarrhoea.

The study’s findings suggest that using the low-sodium, low-glucose ORS formulation reduces the need for intravenous fluids by 33 percent. The effect of this reduction could result in fewer children requiring hospitalization, fewer secondary infections, a diminished need to handle blood with its potentially dangerous consequences, and lower health care costs.

Reduced osmolarity ORS	grams/litre	Reduced osmolarity ORS	mmol/litre
Sodium chloride	2.6	Sodium	75
Glucose, anhydrous	13.5	Chloride	65
Potassium chloride	1.5	Glucose, anhydrous	75
Trisodium citrate		Potassium	20
dihydrate	2.9	Citrate	10
		Total Osmolarity	245

Ques.21 - How does ORS work?

Ans - A solution of oral rehydration salts (ORS) is a simple, inexpensive and life-saving remedy that prevents dehydration among children with diarrhoea. Under normal conditions, the small intestines absorb water and electrolytes (like sodium and potassium) from the digestive tract so that these nutrient-rich fluids may be transported to other parts of the body through the bloodstream. In diarrhoea, infection causing pathogens damage the

intestines – causing an excessive amount of water and electrolytes to be secreted rather than being absorbed. Disruption of the epithelium of the intestine due to microbial or viral pathogens is a very common cause of diarrhoea in all species. The infection damages the inner lining of the intestine. The injured intestine lining leaks fluid and allows food to pass through without absorbing any nutrients. The immune response to inflammatory conditions in the intestine contributes substantively to development of diarrhoea. When the ORS solution reaches the small intestines, the sodium and glucose in the mixture are transported together across the lining of the intestines, and the sodium, which is now in higher concentrations in the intestines, promotes water absorption back into the body from the gut.

Ques. 22 – What is the method of preparation of commercial ORS?

Ans –

1. Take one litre or five glasses of safe drinking water in a clean container.
2. Empty the content of ORS packet into one litre of water.
3. Mix it well and start feeding the child.
4. During first four hours, ORS is given according to the age of the child

Note: Read instructions on ORS packet carefully before preparing ORS.

Ques. 23 – What quantities of ORS given during First Four Hours of diarrhoeal episode?

Ans. Infants can be given following quantities of ORS, depending on the extent of dehydration:

- ✓ Infant (4 mths.) – 2 Cups (200-400 ml)
- ✓ Infant (4 mths.– 1 yr.) – 3-4 Cups (400-700 ml)
- ✓ Child (1-2 yrs.) – 5-6 Cups (700-900 ml)
- ✓ Child (2-5 yrs.) – 6-8 Cups (900-1,400 ml)

Ques. 24 - How can one prepare ORS at home, in case the commercial packets are not available?

Ans. If ORS is available at home, the mother should give ORS solution, as ORS can not only treat dehydration but it can also prevent dehydration to occur in a child with diarrhoea.

In case ORS is not available at home the mother can safely give the recommended home fluid or food-based fluids, such as gruel, soup, or rice water, coconut water, buttermilk, or she can also prepare a similar ORS solution at home by mixing simple ingredients available at home in case the commercial packets of ORS are not readily available.

The following method of preparation can be adopted:

In one litre boiled and later cooled water add 20g of glucose or 40 g sugar	Or	In one litre of water add 50 g (2 heaped tablespoons) rice powder and boil for 4-5 minutes
Then add		
3.5 g (1/2 teaspoon) sodium chloride (common salt)		
2.5 g (1/2 teaspoon) sodium bicarbonate, or cooking soda, and		
1.5 g potassium chloride (or ½ teaspoon lemon juice)		

Mix well and store in a clean bottle (it can be kept at room temperature for 5-6 hours only and for 24 hours in a refrigerator)

Ques.25 - How to give ORS solution?

Ans.

- Give ORS slowly. Every time the child feels thirsty or passes stool, give ORS. It should be provided to the child at frequent intervals.
- The solution should be given to infants and young children using a clean spoon and cup/bowl.
- Feeding bottles should *not* be used.
- For babies, a dropper or syringe (without the needle) can be used to put small amounts of solution into the mouth.
- Children under 2 years of age should be offered a teaspoonful every 1-2 minutes; older children (and adults) may take frequent sips directly from the cup.

- Vomiting often occurs during the first hour or two of treatment, specially when children drink the solution too quickly, but this rarely prevents successful oral rehydration since most of the fluid is absorbed. After this time vomiting usually stops.
- If the child vomits, wait 5-10 minutes and then start giving ORS solution again, but more slowly i.e. a spoonful every 2-3 minutes.
- If the child wants more ORS than what is recommended, it should be given.
- Child should be given ORS till he/she begins to pass urine normally and looks normal
- Fresh ORS should be prepared every day or in every 24 hours.

Ques.26 – How should ORS solution be stored?

Ans –

1. Keep ORS solution in a clean, covered container.
2. Make fresh ORS solution when needed.
3. ORS solution should not be kept for more than 24 hours.

Ques.27 - What are the general points to be kept in mind while managing diarrhoea at home?

Ans. - Home treatment of diarrhoea includes:

- ✚ Intake of Home Available Fluids
 - ✚ Oral Rehydration Solution (ORS)
 - ✚ Continued Feeding
 - ✚ Continued Breastfeeding
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- ✓ Note: Do not give a child with diarrhoea any tablets, antibiotics or other medicines unless prescribed by a doctor.
 - ✓ A child with persistence diarrhoea or dysentery or severe diarrhoea should be referred to PHC/Hospital.

Ques.28 - What type of diet should be given during diarrhoea?

Ans. A child with diarrhoea loses weight and can quickly become malnourished. Nutritious foods will help the child recover more quickly. A child with diarrhoea may not want to eat or may vomit, so feeding can be difficult.

- ✚ Breastfeeding should be more frequent.
- ✚ If the child is 6 months of age or older, parents and other caregivers should encourage the child to eat as often as possible, offering small amounts of soft, mashed foods or foods the child likes. These foods should contain a *small* amount of salt.
- ✚ Soft foods are easier to eat and contain more fluid than hard foods.
- ✚ Recommended foods for a child with diarrhoea are well-mashed mixes of cereals and beans, fish, well-cooked meat, yogurt and fruits.
- ✚ A little oil can be added to cereal and vegetables, about 1 or 2 teaspoons.
- ✚ Foods should be freshly prepared and given to the child five or six times a day.

After the diarrhoea stops, extra feeding is vital for a full recovery. At this time, the child needs to be given more food than usual, including breastmilk, to help replenish the energy and nourishment lost due to the diarrhoea. A child is not fully recovered from diarrhoea until she or he is at least the same weight as when the illness began.

Ques.29 - What are the household methods of safeguarding water?

Ans - Simple yet cost effective methods can be used at the household level to safe guard water and prevent infections –

- **Boiling:** water can be made safe for drinking by boiling it for 10 mins at 100°C and storing it in covered container.
- **Disinfection using chlorine (sodium hypochlorite)/ Chlorination:** dissolve one teaspoon full of bleaching powder in a glass of water. Use two-three teaspoons full

of this solution to purify a bucket (15-20 litres) of water and agitate; and wait for 30 minutes before drinking.

- **Filtration** - Household filters potentially present certain advantages over other technologies. They introduce no chemicals into the water that may affect use due to objections about taste and odour, are easy to use higher quality **ceramic filters** treated with bacteriostatic silver have been shown effective and **slow-sand filters**, which remove suspended solids and microbes by means of a slime layer that develops within the top few centimetres of sand, are capable of removing 99% or more of enteric pathogens.
- **Combination Flocculation** (*To cause (soil) to form lumps or masses*) and **Disinfection**: A particular challenge for most household-based water treatment technologies is high turbidity (muddy appearance). Solids can use up free chlorine and other chemical disinfectants, cause early clogging of filters, and block UV (ultra violet) radiation essential in solar disinfection. While turbidity can often be managed by pre-treatment or even simple sedimentation, flocculation/coagulation using common substances such as **alum** can be an effective and relatively low-cost option.
- **Boiling and Solar Disinfection**: Solar disinfection, which combines thermal and UV radiation, has been repeatedly shown to be effective for eliminating microbial pathogens and reduce diarrhoeal morbidity. It consists of placing low turbidity water in clear plastic bottles (normally 2L PET beverage bottles) after aerating it to increase oxygenation and exposing the bottles to the sun, usually by placing them on roofs. Exposure times vary from 6 to 48 hours depending on the intensity of sunlight

Ques.30 – What role does clean water supply, sanitation and hygiene play in preventing Diarrhoea?

Ans -

- Improvements in sanitation and following good hygiene practices), reduce the transmission of pathogens that cause diarrhoea by preventing human faecal matter from contaminating the environment.
- Washing one's hands with soap can reduce rates of diarrhoeal disease when carried out at critical moments: after using the toilet, after cleaning a child's bottom and before handling food.
- Interventions to improve water quality at the source, along with treatment of household water with chlorination, filtration, combined flocculation and disinfection, boiling and solar disinfection
- To prevent diarrhoea, all faeces, including those of infants and young children, should be disposed of in a latrine or toilet or buried.
- Children and adults can swallow germs that cause diarrhoea if faeces come in contact with drinking water, food, hands, utensils or food preparation surfaces.
- Flies that settle on faeces and then on food also transmit the germs that causes diarrhoea.

To keep away flies and prevent the spread of germs:

- (1) Dispose of faeces safely in a latrine or toilet,
- (2) Keep the latrine or toilet clean, and
- (3) Cover food and drinking water.

- All faeces, even those of infants and young children, carry germs and are dangerous. If children defecate without using the latrine or toilet, their faeces should be cleaned up immediately and disposed of in the latrine or toilet or buried.
- Afterwards, hands should always be washed with soap and water.
- If soap is not available, ash and water can be used as a substitute.
- If there is no toilet or latrine, adults and children should defecate away from houses, paths, water supplies and places where children play. Faeces should then be buried under a layer of soil. Human and animal faeces should be kept away from water sources.

Other hygiene measures that can help to prevent diarrhoea include:

- ❖ Wash the fruits and vegetables thoroughly with hot water if young children eat them raw prepare and thoroughly cook food just before eating (Food left standing can collect germs that can cause diarrhoea. After two hours, cooked foods are not safe unless they are kept very hot or very cold.)
- ❖ Bury, burn or safely dispose of all food refuse to stop flies from spreading disease.

Ques.31 – What role does adequate nutrition and Exclusive Breastfeeding play in preventing diarrhoea?

Ans- Repeated bouts of diarrhoea place children at a greater risk of altering the nutritional status of the child due to decreased food intake and reduced nutrient absorption, combined with the increased nutritional requirements during repeated episodes.

Breastmilk is the best source of liquid and food for a young child with diarrhoea. It is nutritious and clean and helps fight illness and infections. Breastmilk prevents dehydration and malnutrition and helps replace lost fluids.

Mother's milk provides Immunity (immunoglobulin A - IgA) against a wide range of microbes that the mother has had in her gut. Breast milk has also been shown to assist in the development of the infant's own immune system.

Breast milk is also rich in anti-infective factors which have the following beneficial effects on infant's immunity: **First**, they protect the infant without causing the effects of inflammation, such as fever, which can be dangerous for a young infant. **Second**, these factors also contain antibodies formed in the mother's body against the bacteria in her gut, and against infections that she has encountered, so they protect against bacteria that are particularly likely to be in the baby's environment.

Epidermal growth factor found in breast milk stimulates maturation of the lining of the infant's intestine, so that it is better able to digest and absorb nutrients, and is less easily infected or sensitised to foreign proteins.

Infants who are exclusively breastfed for the first six months of life and continue to be breastfed until two years of age and beyond develop fewer infections and have less severe illnesses than those who are not, even among children whose mothers are HIV-positive.

- ✚ Infants who are not breastfed have a six fold greater risk of dying from infectious diseases in the first two months of life, including from diarrhoea, than those who are breastfed. (source add it)

Ques.32 – What is the role of Vitamin A supplementation in prevention and treatment of diarrhoea?

- **Ans.-**Vitamin A supplementation is a critical preventive measure, and in reducing mortality rates in children receiving supplements.

Vitamin A status of the body influences the immune system in important ways:

- It helps maintain the health of epithelial tissues, the first line of defence against bacterial, parasitic, and viral attack.
- Vitamin A also supports the generation important immune cells, maintaining the body's ability to mount an immune response against infectious invaders.
- Vitamin A has been termed as an anti-infectious vitamin because of its role in regulating human immune function.
- Vitamin- A is necessary for clear vision in dim light, and for maintaining the integrity of epithelial tissues. In vitamin A deficiency, the white of the eye (conjunctiva) loses its lustre and becomes dry. In severe vitamin A deficiency, the black area of the eye (cornea) gets necrosed, leading to irreversible blindness in young children. Beta-carotenes also known as provitamin-A possess antioxidant properties. Antioxidants found in beta carotene rich sources like green leafy vegetables, and yellow orange fruits and vegetables like mango, papaya and carrot, restrict the damage that reactive oxygen free radicals can cause to the cell and cellular components. They are of primary biological value in giving protection from certain diseases. Some of the diseases that have their origin in deleterious free radical reactions are atherosclerosis, cancer, cataracts, gastric inflammation etc

When children do not have enough vitamin A they are less able to fight

- Potentially fatal diseases.
- A child who has Diarrhoea and measles deplete vitamin A from the child's body.
- A child with diarrhoea lasting several days or with measles, or who is severely malnourished, should be treated with high-dose vitamin A supplements
- The diet of children should be rich in vitamin A such (vegetable sources) : Green leafy vegetables like agathi, drumstick, spinach, amaranth etc., and fruits like papaya, seasonal fruits like mangoes; tomatoes, yellow pumpkin and Animal sources such as milk, butter, egg and fish etc

It should be made sure that the child gets all the nine vitamin A doses at the specified time along with consumption of vitamin A rich food sources in their diets.

- Child should be given total nine doses of Vitamin A drops starting from 9 months through 5 years of age, every six months.
- For children older than 12 months of age, Vitamin A dose of 2,00,000 IU needs to be given once in 6 months till the child is 5 years of age.
- Vitamin A supplementation has also been shown to reduce the duration, severity and complications associated with diarrhoea.

Ques.33 – Why zinc supplementation is important in management of Diarrhoea?

Ans - Zinc is an important micronutrient for a child's overall health and development. Zinc is lost in greater quantities during diarrhoea. Replacing the lost zinc is important to help the child recover and to keep the child healthy in future.

Zinc is an important part of the treatment of diarrhoea since,

- ✚ Zinc helps to make the diarrhoea less severe, and it shortens the number of days of diarrhoea.
- ✚ Zinc increases the child's appetite and makes the child stronger.

Zinc also helps prevent diarrhoea in the future. By continuing zinc supplementation for 10 to 14 days, the zinc lost during diarrhoea is fully replaced and the risk of the child having new episodes of diarrhoea in the following 2 to 3 months is reduced.

Zinc in zinc tablets and zinc oral solutions can be in the form of zinc sulfate, zinc gluconate, or zinc acetate, all water-soluble zinc salts. The most widely used zinc salt is zinc sulfate, essentially because it is the cheapest of the three zinc salts mentioned above.

- ✚ Along with oral zinc supplements, good Dietary sources of zinc like flesh foods, liver, fish and milk, pulses and nuts are relatively rich sources of Zn must be included in the diet of the children (6 months and above)

Ques.34 – What is the government policy on use of zinc in the national programme for management for diarrhoea?

Ans -

- ✚ Zinc (20mg/day for 14 days) is to be used in the national programme as an adjunct to ORS in the management of diarrhoea in children older than 2 months.
- ✚ A stable formulation (stable at room temperature for three years) is available.
- ✚ It is well accepted by children and mothers.
- ✚ Apart from reducing duration and severity of the treatment episode of acute diarrhoea, zinc treatment in programmatic condition has the potential to decrease hospital admission rates by 15 – 20 %, decrease child mortality by 3 -35 % and decrease the incidence of subsequent episodes of diarrhoea and possibly pneumonia over ensuing 3 months

Age	Amount and Frequency of Zinc tablet
2 months to 6 months	½ tablet per day dissolved in breast milk
older than 6 months	1 tablet a day dissolved in breast milk or water

- ✚ The committee recommended use of 20 mg of zinc sulphate dispersible tablets for use in childhood diarrhoea for program purposes
- ✚ The tablets will be advised for 14 days beginning from the day the child sought care.
- ✚ Zinc fortified ORS is not recommended

Ques.35 – What role does Immunization play in preventing Diarrhoea?

Ans - Immunizations helps in reduction of deaths from diarrhoea in two ways:

By helping prevent infections that cause diarrhoea directly, such as rotavirus, Rotavirus vaccine

Source: Pneumonia and diarrhoea, tackling the deadliest diseases for the world’s poorest children, UNICEF, June 2012

- By preventing infections that can lead to diarrhoea as a complication of an illness, such as measles.
- ◆ Global rotavirus vaccine introduction has recently been recommended by the World Health Organization (WHO).
- ◆ Measles is an acute viral infection that is often self-limiting. But some children, particularly those who are undernourished or have compromised immune systems, may experience serious side effects, including diarrhoea.

Diarrhoea is one of the most common causes of death associated with measles worldwide.
Measles Immunization

Age	9 months	16-24 months
Name of the vaccination	measles	Measles DPT booster
This would be followed by Measles 2nd Dose provided to children at age of 16-24 months along with DPT booster after a gap of 6 months.		

Ques. 36 – What are the recommended diets for children suffering from persistent diarrhoea?

Ans– Following diets may be consumed during episodes of persistent diarrhoea:

The Initial Diet A

[Reduced lactose diet; milk rice gruel, milk sooji gruel, rice with curd, dalia]

Ingredients	Measure	Approximate quantity
Milk	40 ml	1/3 cup
Sugar	2 g	½ level tsp
Oil	2 g	½ level tsp
Puffed rice Powder (Can be substituted by cooked rice or sooji)	12.5 g	4 level tsp
Water	To make 100 ml	
Method of Preparation:		
✚ Mix milk, sugar, rice together		
✚ Add boiled water & mix well		
✚ Add oil		

The second Diet B

[Lactose-free diet with reduced starch]

Note: About 50-70% of children improves on the initial Diet A. Remaining children, if free of systemic infection are changed to Diet B which is milk (lactose) free and provides carbohydrates as a mixture of cereals and glucose. Milk protein is replaced by chicken or egg.

Ingredients	Measure	Approximate quantity
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Egg white	15 g	3 level tsp
Glucose	3 g	3/4 level tsp
Oil	4 g	1 level tsp
Puffed rice powder (Can be substituted with cooked rice)	7 g	2 level tsp
Water	To make 100 ml	
Method of Preparation		
Whip the egg white well. Add puffed rice powder, glucose, oil and mix well. Add boiled water and mix rapidly to avoid clumping.		

The Third Diet C

[Monosaccharide (simple carbohydrate) based diet]

Overall 80-85% patients with severe persistent diarrhoea will recover with sustained weight gain on the initial Diet A or the second Diet B. A small percentage may not tolerate a moderate intake of the cereal in Diet B. These children are given the third diet (Diet C) which contains only glucose and a protein source as egg or chicken. Energy density is increased by adding oil to the diet.

Ingredients	Measure	Approximate quantity
Chicken or	12 g	2 ½ level tsp
Egg white	25 g	5 level tsp
Glucose	3 g	¾ level tsp

Oil	4 g	1 level tsp
Water	To make 100 ml	½ - ¾ cup
Method of Preparation		
<ul style="list-style-type: none"> ✚ Boil chicken, remove the bones and make chicken puree. Mix chicken puree with glucose and oil. Add boiled water to make a smooth paste. 		
Or		
<ul style="list-style-type: none"> ✚ Whip the egg white well. Add glucose, oil and mix well. Add boiled water and mix rapidly to avoid clumping. 		

Source: Ministry of Health & Family Welfare, Government of India, 2009, World Health Organization, Unicef. Facility Based Integrated Management of Neonatal and Childhood Illness (F-IMNCI)

Ques. 37 - What is the Role of AWW in diarrhoeal management of children?

Ans -

- ✚ The AWW/ASHA should advise the mother to start giving fluids or ORS Solution to the child immediately
- ✚ The AWW should also observe as to see how the mother is breastfeeding the infant and correct the feeding practice in case the mother is unable to breast - feed the child properly.
- ✚ The AWW must give ORS packets to mothers
- ✚ Must Advise mother to continue breastfeeding the child
- ✚ Monitor the progress of the child
- ✚ As a follow-up, ask the mother to bring the child to AWC again after 2 days

Ques.38 - What should be the diet and feeding pattern during diarrhoea?

Ans. - In general, foods suitable for a child with diarrhoea are the same as those required by healthy children.

General recommendations:

- ✓ **Continue to feed the child:**

Continued feeding speeds the recovery of normal intestinal function, including the ability to digest and absorb various nutrients. In contrast, children whose food is restricted or diluted lose weight, have diarrhoea of longer duration, and recover intestinal function more slowly.

Therefore, the infant's usual diet should be continued during diarrhoea and increased afterwards. Food should *never* be withheld and the child's usual foods should *not* be diluted.

✓ **Continue to breast-feed:**

Breastfeeding should *always* be continued since breast milk is the best source of liquid and food for a young infant with diarrhoea. It can reduce the severity and frequency of diarrhoea.

Specific recommendations:

<i>Milk</i>		
<i>Infants who are exclusively breast-fed</i>	Should be allowed to breastfeed as often and as long as they want.	Infants will often breastfeed more than usual; this should be encouraged
<i>Infants not being exclusively breast-fed</i>	should be given their usual milk feed (or formula) at least every three hours	If possible, the infant should become exclusively breastfed
<i>Infants below 6 months of age who take breastmilk and other foods</i>	Should receive increased breastfeeding.	If possible, the infant should become exclusively breastfed
Note: As the child recovers and the supply of breast-milk increases, other foods should be decreased. (If fluids other than breast milk are given, use a cup, not a bottle.)		
<i>Other foods</i>		
If the child is at least 6 months old or is already taking soft foods	should be given cereals, vegetables and other foods, in addition to milk	
If the child is over 6 months and complimentary feeding has yet not initiated	Complimentary feeding should be started during the diarrhoea episode or soon after it stops.	

- ✓ They should be well cooked, and mashed or ground to make them easy to digest; fermented foods are also easy to digest.
- ✓ Milk should be mixed with a cereal.
- ✓ 5-10 ml of vegetable oil may be added to each serving of cereal to increase the calorie-density of the meal.
- ✓ Meat, fish or egg should be given, if available.

- ✓ Foods rich in potassium, such as bananas, green coconut water and fresh fruit juice are beneficial.

Ques.39 - What should be the frequency of meals? How much food and how often?

Ans.

- ✓ Offer the child food every three or four hours (six times a day).
- ✓ Frequent, small feedings are tolerated better than less frequent, large ones.
- ✓ After the diarrhoea stops, continue giving the same energy-rich foods and provide one more meal than usual each day for at least two weeks.
- ✓ If the child is malnourished, extra meals should be given until the child has regained normal weight-for-height.

Ques.40 - What liquids must be avoided during diarrhoeal episodes?

Ans. - A few fluids are potentially dangerous and should be avoided during diarrhoea. Specially important are drinks sweetened with sugar, which can cause osmotic diarrhoea and hypernatraemia (more than normal levels of sodium in the blood).

Some examples are:

- ✚ Commercial/packaged carbonated beverages like cold drinks
- ✚ Commercial/ packaged fruit juices
- ✚ sweetened tea
- ✓ Other fluids to be avoided are those with stimulant, diuretic or purgative effects, for example: coffee, some medicinal teas or infusions.

Source:

Web Link:

<http://www.nihfw.org/NCHRC/GuidelinesAndManuals.html>

<http://books.google.co.in/books?id=46o0PzPI07YC&pg=PA362&lpg=PA362&dq=functions+of+vitamin+A&source=bl&ots=GjyzcoGDIJ&sig=FhdjXI4MrD32Fykk8GuCpu7NITU&hl=en&sa=X&ei=qvExUP6CJ8fsrAeW9YHYAQ&ved=0CFYQuwUwBg#v=onepage&q=functions%20of%20vitamin%20A&f=false>

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