SMAART Nutrition Informatics Template

What is Anemia?

Anemia occurs when the number of red blood cells circulating in the body decreases. It is the most common blood disorder.

Around one-third of the world's population has a form of anemia, according to a 2015 article in The Lancet.

It often develops as a result of other health issues that interfere with the body's production of healthy red blood cells (RBCs) or increase the rates of the breakdown or loss of these cells.

Types of Anemia

There are many types of anemia and no single cause. In some people, it can be difficult to identify what is causing a low RBC count.

The three main causes of anemia are:

- **Blood loss**

Iron-deficiency anemia is the most common type of anemia, and blood loss is often the cause.

- **Decreased or impaired RBCs**

Problems with bone marrow can cause anemia. Aplastic anemia, for example, occurs when few or no stem cells are present in the marrow.

Other types of anemia that occur due to decreased or impaired RBCs include:

- **Sickle cell anemia**

This causes RBCs to be shaped like crescents. They may break down more quickly than healthy RBCs or become lodged in small blood vessels.

This blockage can reduce oxygen levels and cause pain further down in the bloodstream.

- **Iron-deficiency anemia**

This involves the body producing too few RBCs due to a lack of iron in the body.

- **Iron-deficiency anemia may develop as a result of:**

Diet low in iron, menstruation, frequent blood donation, endurance training, certain digestive conditions.

- **Vitamin-deficiency anemia:**

Vitamin B-12 and folate are both essential for the production of RBCs. If a person does not consume enough of either vitamin, their RBC count may be low.

TYPES AND EFFECTS OF ANEMIA

- **Aplastic anemia**: This can cause a fever, frequent infections, and skin rashes.
- **Folic acid deficiency anemia:** This can cause irritability, diarrhoea, and a smooth tongue.
- **Haemolytic anemia: T**his can cause jaundice, dark urine, a fever, and abdominal pain.
- **Sickle cell anemia**: This can cause painful swelling in the feet and hands, as well as fatigue and jaundice.

Case study given: A 15-year female who weighs 30 kgs and with height of 5 '1 whose Hb levels are 9.0 gm/ dL and moderate anaemic. Plan an individualized diet plan for her.

STEP 1: For any nutritional planning we need to collect the basic anthropometry values for screening and intervention. So, the first step includes asking the individual about his/ her

1. Weight
2. Height
3. Age
4. Recent medical reports if one has any
5. Any kind of comorbidities he/ she has or had in the past
6. Socio - economic status of individual

Here the case study is regarding Anemia so its mandatory for one to get his/her Haemoglobin values of recent times.

STEP 2: Classifying the person based on his BMI and anthropometric measurements and Identifying the cause of anemia as Anemia can be due to various reasons as mentioned earlier.

Grade	Reference BMI	Calculated BMI
Underweight	<18.5	15.8
Normal	18.5-24.9	
Overweight	25 - 29.9	
Obese	> 30	

- So, the girl here is Severely malnourished as her BMI is 15.8
- Her ideal body weight should be = 55 kg
- Whereas her weight is 38
- Therefore, the girl needs to gain weight along with increasing her Haemoglobin levels and with healthy diet

STEP 3: The dietary principle for this individualized diet plan

High calorie, High protein, moderate fat, moderate fibre, High Vitamin and minerals especially rich in iron and vitamin c diet need to be provided.

List Of foods to be avoided: Caffeine after or before meals, coffee, tea, including excess of tamarind in dal, high fibre foods.

List Of foods to be included: Greens locally available one, Ragi, locally available fruits.

STEP 4:

For and effective Nutritional planning we need to collect data regarding the individuals

- Food preferences (Vegetarian / Non vegetarian)
- Food habits
- Foods avoided or disliked
- Food allergies
- Economic background

For an easy approach we can also collect 24-hour dietary pattern using a questionnaire on 24-hour dietary re-call method.

STEP 4:

1. Providing a Nutritious diet plan
2. Council ling on importance of Including Iron rich foods, folate, Vit- B12 rich foods, Vitamin - A rich foods,
3. Will explain the need to follow the diet regimen,
4. Counselling regarding the consequences and causes of anemia

		Usual eating time	Foods you normally eat	Portion size you eat	Ideal Eating time	Foods you should eat	Portion size you should eat	Foods You should avoid	Comments
Monday	Breakfast				7 – 8: 30 am	Beetroot paratha Ladies finger curry	2 1	Tea, Coffee to be avoided 1 hour	

						Boiled egg	1	before and after meal.	
	Mid Meal				10 – 11 am	Rajma chat Orange juice	1 1		
	Lunch				12 – 2 pm	Mix veg's pulao Carrot raita	3 1		
	Evening				4 pm	Batata poha	1		
	Late evening				6 pm	Fruit bowl	1		
	Dinner				8 – 9: 30 pm	Phulka Potato curry Palak dal Veg salad	3 1 1 1		
	After Dinner				10 pm	milk	1		
Tuesday	Breakfast				7 – 8: 30 am	Idli / dosa with coconut chutney / sambar	3	tea	Avoid tea on empty
	Mid Meal				10 – 11 am	Peanut poha	1		
	Lunch				12 – 2 pm	Rice / roti with any GLV dal + vegetable curry	2 + 1		For vegetable curries preferably vitamin c rich like cauliflower capsicum tomatoes Enrol in ICDS programs

	Evening				4 pm	Uttapam	1		
	Late evening				6 pm	Peanut-seasame chikki + guava	1 + 1	Avoid consuming processed foods like chips	Include fruits like orange amla in your diets
	Dinner				8 – 9: 30 pm	Vegetable khichdi with tomato curry	2 + 1		Include achars made of amla, chillies that will help in better absorption of vit c and also add probiotics
	After Dinner				10 pm	buttermilk	1		
Wednesday	Breakfast				7 – 8: 30 am	Aloo Paratha + Boiled Egg	3 + 1	Tea & fluids before breakfast or in between as it makes the stomach full	Avoid tea on empty stomach
	Mid Meal				10 – 11 am	Peanut Chikki + Guava	1 + 1		Including vitamin c rich foods helps with iron absorption
	Lunch				12 – 2 pm	Rice / roti with any GLV dal + vegetable curry + Curd/buttermilk	2 + 1 + 1 + 1	Drinking water or fluids before lunch or in between	For vegetable curries preferably vitamin c rich like

								as it makes the stomach full	cauliflower capsicum tomatoes
	Evening				4 pm	Chickpea & Beetroot Kebab + Mint Chutney	1 + 1	Deep frying	Use boiled beetroot & chickpeas to reduce extra frying exposure
	Late evening				6 pm	Bhel Chaat (puffed rice + tomatoes + cucumber + onion + lemon)	1	Too much spices	Including vitamin c rich foods helps with iron absorption
	Dinner				8 – 9: 30 pm	Rice / roti with any GLV dal/non – veg Curry + vegetable curry	2 + 1 + 1	Drinking water or fluids before lunch or in between as it makes the stomach full	Include achars made of amla, chillies that will help in better absorption of vit c and also add probiotics
	After Dinner				10 pm	Warm Milk	1	Avoid refined sugar	Warm milks induce sleep
Thursday	Breakfast				7 – 8: 30 am	Idli/ dosa, with Sambar	2 idli's with 1 katori sambhar	Fried foods	Breakfast is the first meal of the day; therefore, it should be healthy and nutritious
	Mid Meal				10 – 11 am	Guava	1 serving	Fried chips and snacks	Fruits are excellent source of essential vitamins,

									fibre and minerals
	Lunch				12 – 2 pm	Curd rice with Palak dal	2 servings of curd rice with 1 serving of Palak dal	Foods low in iron and fibre.	Adding green leafy vegetable to the dal will increase its nutritional value in terms of iron
	Evening				4 pm	Poha chivda with lemon juice	1 serving of poha with 1 glass of lemon juice	Fried foods and processed foods	Poha is a wholesome meal, and is a good source of iron. Adding vitamin C rich drink with poha will help in proper iron absorption
	Late evening				6 pm	Gud Ki kheer	1 katori	Foods like tea and coffee should be avoided.	Jaggery, contains good amount of iron which can help in restoring Haemoglobin levels
	Dinner				8 – 9: 30 pm	Vegetable Upma with boiled egg	2 servings of veg upma with 1 boiled egg	-	Dinner should be light but well balanced in all nutrients.
	After Dinner				10 pm	Turmeric milk	1 cup	-	Enriched with goodness of nature, Turmeric

									milk is loaded with antioxidants and can help in boosting immunity.
Friday	Breakfast				7 – 8: 30 am	Bajra Roti Cucumber Raita Boiled Egg	1 1 1	tea	Avoid tea on empty stomach as it inhibits the iron absorption.
	Mid Meal				10 – 11 am	Poha Orange	1 1		Poha and orange are good combination which aids in effective iron absorption.
	Lunch				12 – 2 pm	Rice / roti with any veg curry + Amaranth Dal + Plain Curd	2 + 1 1 1	Some foods can make it harder for your body to absorb iron. These include coffee, tea, milk, egg whites, fiber, and soy protein. Try to avoid these foods if you have iron	Amaranth is a rich source of iron. Veg curry preferably as tomatoes as they rich source of vit-c.

								deficiency anemia.	
	Evening				4 pm	Puffed rice laddu/ Chikki	1		
	Late evening				6 pm	Pomegranate	1		Include Pomegranate as it improves blood flow.
	Dinner				8 – 9: 30 pm	Rice+ Veg/Non veg curry + Tomato Dal+ Cucumber Raita	2 + 1 1 1		Include Non veg foods as Beef & chicken and Fish (halibut, haddock, salmon, tuna). they have Haem Iron
	After Dinner				10 pm	Buttermilk with Methi powder	1		Fenugreek leaves are rich in Iron and make for a good remedy to treat anemia. Iron intake aids blood formation and promotes Red Blood Corpuscles and Haemoglobin levels.
Saturday	Breakfast				7 – 8: 30 am	Ragi Idli / puffed Bengal gram dosa with	3		

						mint chutney / sambar			
	Mid Meal				10 – 11 am	Puffed rice and vegetable patties orange	1		
	Lunch				12 – 2 pm	Rice / multigrain roti with any GLV dal/ vegetable curry	2+1		
	Evening				4 pm	Sprouts salad+ papaya	1+1		
	Late evening				6 pm	sesame and jaggery laddus	1		Chikkies and laddus can help in healthy weight gain
	Dinner				8 – 9: 30 pm	Methi Khichdi + vegetable curry	2+1		
	After Dinner				10 pm	lassi	1		
Sunday	Breakfast				7 – 8: 30 am	Ragi dosa sambar	2 1	Foods's rich in calcium such as yogurt, milk, tea and coffee need to be avoided and should not be taken along with foods rich in iron.	Vitamin c rich foods such as orange, amla, lemon juice can be taken along with iron rich foods to increase iron absorption.
	Mid Meal				10 – 11 am	Sprouts salad	1		
	Lunch				12 – 2 pm	Phulka Lemon rice Palak dal Veg-raita	2 1 1 1		
	Evening				4 pm	Puffed rice laddu	1		

	Late evening				6 pm	Poha cutlet	1		
	Dinner				8 – 9: 30 pm	Phulka Rice Amaranth dal Brinjal curry	2 1 1 1		
	After Dinner				10 pm	Warm Milk	1