

1. Planning of diet and calculation of nutritive values of the following.

Clinical Nutrition, on the other hand, as a study focuses on the nutritional management of individuals or groups of individuals with established disease conditions. Clinical Nutrition deals with issues such as altered nutritional requirements associated with the disease, disease severity and malnutrition and many such issues about which we will learn in this course. Nutrition is an integral part of medical therapy as adequate nutrition support can go a long way in improving quality of care and improving patients' medical outcome.

Dietetics and Role of Dietician in Health Care.

The branch of medicine concerned with how food and nutrition affects human health comprising the rules to be followed for preventing, relieving or curing disease by diet is called Dietetics.

Clinical Dietetics: It is the application of dietetics in a hospital or health care institutional setting. Clinical dietetics.

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focuses on individual nutrition support and symptom management.

Diet Therapy:- It is a branch of dietetics concerned with the use of food for therapeutic purpose. Diet therapy is a broad term used for practical application of nutrition as a preventive or corrective treatment of a disease. The therapy may involve including foods that improve the health condition while avoiding foods that may take or make the condition worse.

The principles of diet therapy are:

- Maintain good nutritional status.
- Correct deficiencies or disease, if any,
- provide rest to the body
- help metabolize the nutrients, if any,
- Make changes in body weight, when necessary.

Therapeutic diets:- It refers to a meal plan that controls the intake of certain foods or nutrients. They are adaptation of the normal regular diets. Some common examples of therapeutic diets include clear liquid diet, diabetic diet, renal diet, gluten free diet, low fat diet, high fibre diet etc.

Role of Dietician in Nutrition Care:-

Dietitian you know is an expert in dietetics, dealing with human nutritional care. A dietitian apply the science and principles of human nutrition to help people understand the relationship between food and health and make appropriate dietary choices to attain and maintain health and to prevent and treat illness and disease.

Dietitians work in a wide variety of roles in, for example, a clinical, public health or community, food service, administrative, freelance consultancy, research or teaching capacity. The activities most likely to be undertaken by clinical dietitians would include:

- Collecting, organizing and assessing data relating to health and nutritional status of individuals, groups and communities.
- Review and analyze patients nutritional needs and goals to make appropriate dietary recommendations.
- Develop and implement nutrition care plans and monitor, follow up and evaluate these plans and take corrective measures wherever required.
- Calculate nutritional value of food meals planned.
- prescribe therapeutic diets and special nutrition support and feeding requirements.
- plan and prepare basic menus and assist in supervising

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food service personnel in preparing menus and serving of meals.

schedule work assignments in dietary unit to facilitate the effective operation of kitchen and other food preparation or dining areas.

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1.
AIM: To update diet for peptic ulcers; soft and bland diet.

PRINCIPLES: Controlling gastric acidity, hypermotility and promoting ulcer healing.

PROCEDURE:-

- Peptic ulcers: Normal gastric and duodenal mucosa is protected from the digested actions of acid and pepsin by the secretion of mucus, the production of bicarbonate, the removal of excess acid by normal blood flow, and the rapid renewal and repair of epithelial cells injury. Peptic ulcer refer to an ulcer that occurs as result of breakdown of these normal defense and repair mechanism. This disintegration of tissues can also result in necrosis. Peptic ulcer normally involves two major regions:- gastric and duodenal. uncomplicated peptic ulcer in either region may present with signs similar to those associated with dyspepsia and gastritis.
- Mechanism of ulcer formation: The pathophysiology of ulcer development in the stomach is not clearly identified although, in general terms, two main factors may be involved: the disruption of the protective mucus layer and the exposure of the underlying epithelium to cytotoxic compounds. The

lumen of the stomach contains many proteases in an acid solution at a pH of about 1.5-2.5. The reduction in protection and the subsequent exposure of the epithelium to damaging agents has been likened to a leaking roof, allowing these agents to directly affect the gastric epithelium and induce ulceration.

Symptoms and clinical findings:

Epigastric pain, heart burn, vomiting, discomfort and flatulence in the upper part of abdomen, stomach and gastric distension, weight loss, anaemia, spasms, feeling of sickness, distension.

principle of the Diet:- A moderate caloric, high protein, low fat, moderate fibre, vitaminised, mineralised, soft and bland diet.

Soft Diet:-

The term "soft" refers to the fact that foods included in this type of diet are soft in consistency, easy to chew and made of simple, easily digestible foods. It does not contain harsh fibre or strong flavours. It is given during acute infections, certain gastrointestinal disorders, and at the post operative stage to individuals who are in early phase of recovery following a surgery. The soft diet provides a transition between a liquid and a normal diet.

i.e., during the period when a patient has to give up a full liquid diet but is yet not able to tolerate a normal diet.

Examples of Soft Diet:- A soft diet freely permits the use of cooked vegetables, soft raw fruits without seeds, broths and all soups, washed pulses in the form of soups and in combination of cereals and vegetables, breads and ready-to-eat cereals and milk beverages, yogurt, light desserts, egg and tender and minced, ground, stewed meat and meat products, fat like butter, cream, vegetable oil and salt and sugar in moderation. Foods to be best avoided in the soft diet include coarse cereals, spicy highly seasoned and fried foods, dry fruits and nuts, rich desserts. Among the soft diet is also the mechanical soft diet also known as the dental diet which is a normal diet that is modified only in texture for ease of mastication i.e., chewing.

Bland Diet:

A bland diet is made of foods that are soft, not very spicy and low in fiber. It consists of foods which are mechanically, chemically and thermally non-irritating i.e., are least likely to irritate the gastrointestinal tract. Individuals suffering

from gastric or duodenal ulcers, gastritis or ulcerative colitis are prescribed this diet.

Foods included:- Milk and milk products low in fat or fat free, Bread, pasta made from refined cereals, rice, Cooked fruits and vegetables without peel and seeds, eggs, and lean tender meat such as fish, poultry that are steamed, baked or grilled, cream, butter, puddings and custards, clear soups.

Nutritional Requirements:-

Zinc:- Zinc is an essential micronutrient which hastens the healing of ulcers. It also improves immunity against *H. pylori* infection which is one of the causative factors of peptic ulcers. It is also found to promote the growth of new cells in the stomach lining.

Selenium:- Selenium in conjunction with zinc helps in building immunity to prevent recurrence of as well as heal the ulcers.

Vitamin E:- The foods like wheatgerm, hazelnuts, cold pressed sunflower seed oil, soybean oil will help along with zinc, found in seafood and whole grains.

Amino acids:- It also have a healing action. Good food sources include: Sesame seed, wheatgerm, almonds, sunflower seeds and sesame seeds.

Oily fish like salmon, mackerel, sardines and herring contain omega-3 fatty acids. They help to reduce the risk of ulcers by producing called prostaglandins, that help to protect the lining of the stomach and intestines.

Observation:- Eating a balanced diet that contains whole grains, fruits and vegetables.

2. AIM:- planning a diet for patients suffering from degenerative diseases.- Diabetes Mellitus.

⇒ PRINCIPLES:- Fruits and vegetables such as whole wheat, brown rice, barley, eggs, chicken, lentils and tofu.

⇒ PROCEDURE:- Diabetes mellitus is a chronic metabolic disorder it prevent the body to utilize glucose. Completely or partially. It is characterized by raised glucose, Conc. in the blood and alteration in carbohydrate, protein, fat metabolism.

Types:- IDDM, NIDDM, malnutrition related diabetes mellitus (MRDM)

Aetiology:- patterns of inheritances and of environmental factor differs in IDDM, and NIDDM.

Genetics:- The inheritance of human IDDM is polygenic. It has been estimated that over 50% of the heritance is contributed by HLA class of II genes (Chromosome 6).

Environmental factors:-

- Infection:- Infection causes a non-specific out pouring of catabolic hormones which antagonize insulin action and then many trigger the onset of disorder.

- Diet:- Wheat and milk protein have been shown to have the strongest diabetic generic effect and one evidently capable of triggering the strings

of events which results ultimately in destruction of pancreatic islets of insulin secreting cells.

NIIDM

- Genetics:- NIIDM is not HLA linked and there is no evidence that automatic autoimmunity or viruses have anything to do with its development.

Environmental Factors:-

- Life style:- NIIDM is associated with people who are obese and underactive usually they overeat.
- Age:- NIIDM is principally a disorder of aged and elderly.
- Abdominal/visceral fat:- people with a high waist/hip ratio, indicating that fat is largely in the abdominal cavity has a greater risk of diabetes than people with a similar amount of fat distributed peripherally.
- pregnancy:- During normal pregnancy the level of plasma insulin is raised by the action of placental hormones thus placing a burden on the insulin binding and increase in monocyte insulin receptor.

Nutritional Requirements:-

- Carbohydrates:- Carbohydrate restriction impairs insulin sensitivity and reversed by high carbohydrate diet. High carbohydrate and high fibre diet improve insulin binding and increase in monocyte insulin receptor.

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- proteins:- A diet having high in protein is good for the health of diabetics because it supplies the essential amino acids needed for tissue repair.
- Fats:- low fat diet increases insulin binding and also reduces LDL and VLDL levels and reduce the incidence of atherosclerosis which is more common in diabetics.
- Dietary fibre:- Dietary fibre and Complex CHO
 - ✓ benefit type I and II diabetics such diet lowers:-
 - ✓ Insulin requirement.
 - ✓ Increase peripheral tissue insulin sensitivity.
 - ✓ Decrease serum cholesterol and triglyceride values.
 - ✓ Aid in weight control
 - ✓ Lower blood pressure.

Energy deficit calculation:-

Step I:- Estimate the recommended individual caloric requirement by calculating the resting energy expenditure [REE]

REE for adult males = $10 \times \text{weight in kg} + 6.25 \times \text{height (in cm)} - \text{age (in year)} + 5$

REE for adult females = $10 \times \text{weight in kg} + 6.25 \times \text{height (in cm)} - \text{age (in year)} - 161$

♀ = BEE = $66.4 + 13.7 (\text{IBW}) + 5H - 6.8A$

♂ = BEE = $655 + 9.6 (\text{IBW}) + 1.8H - 4.7A$

Step 2:- Multiply REE by activity factor of 1.5 for women and 1.6 for men for light activity to estimate daily Calorie need.

$REE \times AEF =$ Estimated total Calorie need (kcal/day) to maintain weight.

Observation:- Eating the right foods for diabetes means eating a variety of healthy foods from all the food groups.

* Focus on whole foods instead of highly processed foods as much as possible.

Aims- plan and prepare a day's diet for a diabetic obese person whose height is 5.5 feet and weight is 80kg. Calculate the REE for modified RDA
Modified RDA for NIDDM:-

Energy:-

Fat:-

protein:-

Fibre:-

Time

food preparation

No. of servings

k-cal.

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3.

AIM:- planning a diet for patients suffering from renal disorders.

PROCEDURE:-

- * Kidneys are the organs that filter waste products from the blood. They are involved in regulating blood pressure, electrolyte balance and RBC production in the body.
- * Renal disease can be attributed to a variety of causes, right from acute conditions that injure the kidneys or from chronic diseases that cause the kidneys to stop functioning.
- * Renal disease can be due to acute kidney failure as an acute rise in serum creatinine level of 25% or more leads to AKI, AKI may be transient or it may develop into chronic renal failure.
- * Glomerular disease:- Any damage to the glomerulus of the kidney leads to glomerular disease. It includes nephritis and nephrosis.

Glomerulonephritis:- Glomerulonephritis is an inflammatory process affecting the glomeruli, the small blood vessels in the head of nephron. It is most common in its acute form in children 3-10 years of age although it can also occur in adults past age 50.

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Clinical symptoms- Haematuria and proteinuria are the classical symptoms. oedema and shortness of breath can occur as a result of sodium and water retention and circulatory congestion.

They may be oliguria and anuria and uraemia which signals development of acute renal failure.

principles of Diet- The dietary management provides optimal nutritional support. Adequate proteins should be given unless there is oliguria or anuria. Salt is restricted if there is ed oedema, hypertension, oliguria.

Nutritional Requirements:-

- Fluid:- During the first of treatment the fluid should be decrease to allow for dispersal of oedema fluid.
- Energy:- For children 30kcal/kg body weight and 10% for infection is suggested.
- Carbohydrates:- Cereals in all forms are allowed, the main sources are cereals (rice, wheat, cornflakes)
- protein:- If the blood urea nitrogen is elevated and oliguria is present, dietary protein must be restricted upto 0.5g/kg ideal body weight/day for older children and 1-1.5g/kg body weight/day for younger children.
- Fats:- The product of fat metabolism donot depend on kidneys, water excretion and so normal fat is suggested.

Potassium Content of Vegetables (mg/100g)

Low (0-100 mg)	Medium (101-200mg)	High (>201mg)
fenugreek leaves, lettuce, beetroot, radish pink, bottle gourd, broad beans, cucumber, knoll khol, green mango, ridge gourd and snake gourd.	carrot, onion, radish, bitter gourd, cauliflower, french beans, ladyfinger , onion stalk, green mango.	Amaranth, Coriander, spinach, Colocassia, potato, yam, drumstick & papaya.

Potassium Content of Fruits (mg/100g)

Fruits low in potassium	mg/100g	Fruits high in potassium	mg/100g
orange	9	Mango	205
pine apple	37	Amla	225
papaya	69	plums	247
Apple	75	Sapota	269
Banana	88	lemon	270
kuava	91	peaches	453
water melon	160	sweet lime	490

- Minerals:- The normal kidneys under normal content automatically regenerated to sodium and potassium needs of the body.
- Sodium:- The restriction of sodium arises with degree of oliguria and hypertension. If renal function is impaired sodium can be restricted up to 500-1000mg/day.
- potassium:- When kidneys do not work properly, potassium builds up in the body and causes the heart to beat unevenly and stops suddenly. All renal patients should be reminded that too little amount of potassium also can be dangerous.

observation:- Reducing animal protein intake and egg yolk and increasing intake of fruits and vegetables and fiber may prevent or delay end-stage renal disease.

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LIVER DISORDER

4

AIM:- planning a diet for patients suffering from liver disorder.

PRINCIPLE:- The RDA source of protein are:- lean meat, lean cottage cheese, skim milk, eggs and fish.

PROCEDURE:- Liver is body's chemical workshop. It is mainly responsible for the metabolism of nutrients. It is a most metabolically active organ carrying out 36000 functions. Any damage to the liver cells results in liver diseases. Liver disease can be inherited or caused by a variety of factors that necrosis of liver cells and cirrhosis of liver which can lead to liver failure. Agents responsible for liver damage:-

- Dietary deficiency
- Ineffective agents.
- Toxic agents.

⇒ Jaundice:-

Introduction:- Infective hepatitis is otherwise known as jaundice via hepatitis. This is the common cause jaundice. Symptoms of infective hepatitis are anorexia, fever and headache and rapid weight loss, loss of muscle tone, nausea, and vomiting and abdominal discomfort. The

Symptoms may continue for 4-8 weeks.

Principles of Diet:- A high protein, high carbohydrate, moderate fat is recommended. Small and alternate meals at regular intervals are better tolerated, over feeding should be avoided.

Nutritional Requirements:-

Energy:- Gastro feeding stage about 1000kcal are supplied. In severe cases 1600-2000kcal are suggested.

Proteins:- For the liver cells to regenerate an adequate supply of protein is needed. With severe jaundice, 40g while in mild jaundice 60-80g of protein is permitted. With hepatic percoma and Coma, high protein rich foods are withheld.

Carbohydrate:- High CHO content in the diet is essential to supply enough calories so that tissue protein breakdown can be avoided for drawing calories. Simple and complex carbohydrates in good combination is suggested.

Vitamins:- They are essential to regenerate liver cells. 300mg of vitamin C, 10mg of vitamin K and supplements of B Complex are suggested.

Food Content:-

Food included	Foods avoided.
Cereals, porridge, soft chapatis, bread, rice, skim milk, potato, yam, fruits, fruit juices, sugar, jaggery, honey, soft custards without butter, cream and stimulating mild beverages.	pulses, beans, meat, fish, chicken, egg, meat soup, sweet preparation where ghee, butter or oil are used. dried fruits, nuts, spices, papad, chutney, alcoholic beverages.

- Minerals:- If food is not taken orally, a careful watch should be kept on the serum, sodium and potassium levels.

Observation:- The recommended protein intake in patients with a diagnosis of liver cirrhosis is 1.2-1.5g/kg. BW/d to prevent loss of muscle mass and reverse muscle loss.

Aim:- To plan and prepare a day's diet for person suffering from jaundice.

RDA:-

Pat:-

Energy:-

Carbohydrate:-

protein:-

A day's diet for patient suffering from jaundice.

Time	Food preparation	No. of serving	k-cal.

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OBESITY

5
AIM:- planning a diet to a person suffering from obesity.

PRINCIPLE:- Low-caloric diets are recommended.

PROCEDURE:-

- Obesity is an objective measurement assessed as Body mass index $\geq 30 \text{ kg/m}^2$.
- Obesity exposes surgical patients to increased morbidity and mortality.
- A low fat diet, as the name implies, is a dietary pattern that limits the fat intake at about 1/3 of the total daily calories consumed. It consists of little fat, particularly saturated fats and cholesterol which lead to increased blood cholesterol levels and heart attack.
- This type of diet plan to reduce obesity focuses on foods that contain whole grains, fruits and vegetables. plenty of vegetables and proteins in a typical low fat diet supply the body with energy but very little fats.

Clinical symptoms:- Excess body fat, particularly around the waist; shortness of breath, sweating more than usual.

Nutritional Requirement:-

- Carbohydrate:- Generally, Consuming 50-150 grams of Carbohydrates per day can be effective in losing weight. Healthy carbohydrate sources are fruits, vegetables, whole grains, legumes, nuts and seeds.
- protein:- people who are overweight or obese are best served by consuming 1.2 - 1.5g/kg (0.54 - 0.68g/lb)
- vitamins:- Getting enough vitamin D can keep your hormone levels in check and may help enhance weight loss and decreased body fat.

Observation:- The optimal diet for prevention of weight gain, obesity, metabolic syndrome and type 2 diabetes is fat reduced, fiber-rich and high in low-energy density carbohydrates.

Example!

Full name	Mid- upper Arm Circumference
Purpose.	used to determine malnutrition
procedure	use a measuring tape to measure the distance around the upper arm.
Normal ranges.	over 23cm for males or 22cm for females is considered normal.

ANTHROPOMETRIC

MEASUREMENTS

Aim:- To know about anthropometric measurements and

PRINCIPLES:- poster paper, markers.

Instructions:- The poster should be organized and informative, as if its purpose is to be hung in a doctor's examination room for patients to view while waiting to be seen by a doctor.

PROCEDURE:-

Anthropometry:- Anthropometry is a branch of science that uses non-invasive methods for determine the body size and body composition of individuals.

- There are actually a multitude of anthropometric measurements that can be include height, weight, head circumference and limb length.
- The most common anthropometric measurements include BMI, waist to hip ratio, and bioelectric impedance and researchers.

Head Circumference: It represents an anthropometric measurement that is commonly used in children to assess their growth rate. It is measured in infants and children using non-stretchable tape measure. The use of a non-stretchable tape measure is important to ensure that any readings are made

Correctly and accurately.

Height: Height refers to the measurement indicating how tall an individual is when standing.

Height is typically measured using a stadiometer, a tool that consists of a platform upon which the individual stands and a sliding caliper that can be adjusted in order to measure the person's height. When measuring a person's height, it is important for the individual to stand straight, with the knees locked and the head held erect.

Weight: It represents a measurement of the individual's mass. A weight scale is typically used to measure weight. Heavy objects such as shoes, coats, and jewellery are usually removed in order to avoid errors in data collection due to excess weight from these items. Weight measurements are typically recorded to the nearest 0.01 kg.

Using height and weight, the body mass index, or BMI, can be calculated for the individual.

The BMI formula is as follows:-

$$\bullet \text{ BMI} = \text{weight (lbs)} / \text{height (in)} \times 703$$

$$\bullet \text{ BMI} = \text{weight (kg)} / \text{height (m)}^2$$

Observation: It can be used to estimate total body fat, as regional fat and fat distribution.

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SPOTTERS:-

1. Soft diet:-

* It is an adequate diet that is soft in consistency, easy to chew, made up of simple easy digestible foods, it is appropriate for patients who have few or no teeth or ill-fitting dentures.

* It is moderately low in cellulose.

Foods included:-

1. Refined cereals.
2. Washed pulses - form of soups and in combination of cereals and vegetables.
3. Milk and milk products
4. Soft fruits like papaya, banana, mango etc.
5. Salt and sugar in moderation.

2. Bland diet:-

* A bland diet is a diet consisting of foods that are generally soft, low in dietary fiber, cooked rather than raw and not spicy.

* It is an eating plan that emphasizes foods that are easy to digest.

* It is commonly recommended for people recovering from surgery or conditions affecting the gastrointestinal tract.

Foods included

1. Cooked vegetables

2. White flour cereals, breads, pasta
3. Eggs, lean meats,
4. Low fat milk and dairy products

3. Clear-fluid diet:-

- * A clear liquid diet limits you to options such as water, broth and plain gelatin.
- * These are easy to digest, and they don't leave food bits in your digestive tract.
- * It is prescribed for a short time before or after some medical procedures or if you have digestive problems.
- * A clear liquid diet can't give all the calories and nutrients you need.
- * ~~ob~~, it generally shouldn't be continued for more than a few days.

4. Full-Fluid Diet:-

- * The full-fluid diet is a diet which consists of foods which are liquid at room temperature or become liquid in the mouth.
- * A full fluid diet is made up only of fluids and to liquid that are normally liquid and foods that turn to liquid when they are at room temperature, like ice-cream. It also includes:
 - Strained Creamy soups.
 - Tea.

- Juice
- Milk shakes

5. Atherosclerosis

- * It is also called Atherosclerotic Cardiovascular disease.
- * It is the buildup of fats, cholesterol and other substances in and on the artery walls.
- * This buildup is called plaque.
- * The plaque can cause arteries to narrow, blocking blood flow.
- * The plaque can also burst, leading to a blood clot.

6. Low sodium diet

- * Sodium is an important mineral that performs many essential functions in our body.
- * A low sodium diet may benefit people with certain health conditions, including kidney disease.
- * Plant-based foods like fresh produce generally have less sodium than animal-based foods, such as meat and dairy products.
- * The low sodium sources are Dry peas and beans, fruits, yogurt, vegetables and Ancient grains.

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7. Low protein diet:-

- * A low-protein diet is often recommended to help treat certain health conditions.
- * Impaired liver function, kidney disease or disorders that interfere with protein metabolism are some of the most common conditions that may require a low-protein diet.

* Foods included:-

1. Bread, oats
2. Apple, pear, guava, peach.
3. Rice, noodles, cereals.
4. Egg plant, potato, okra.
5. Berries, grapes.

8. Jaundice:-

- * Infective hepatitis is otherwise known as jaundice via hepatitis.
- * Symptoms of infective hepatitis are anorexia, fever and headache and rapid weight loss, loss of muscle tone, nausea and vomiting and abdominal discomfort.
- * These symptoms may continue for 4-8 weeks.

Foods included:-

- * Cereals, porridge, soft chapattis.
- * Bread, rice, skim milk, potato.

* Fruits, fruit juices, sugar, jaggery.

9. Cirrhosis

* It is also called hepatic cirrhosis.

* Cirrhosis of the liver is permanent scarring that damages our liver and interferes with its functioning.

* It can lead to liver failure.

* Cirrhosis is the result of persistent liver damage over many years.

* Alcohol and drugs, viruses and metabolic factors are the most common causes.

10. BMI [Body Mass Index]

* Body Mass Index (BMI) is a value derived from the mass and height of a person.

The BMI is defined as the body mass divided by the square of the body height, and is expressed in units of kg/m^2 .

* The BMI is a convenient rule of thumb used to broadly categorize a person as based on tissue mass (muscle, fat and bone) and height.

* BMI has limitations that can make it less useful than some of the alternatives, especially when applied to individuals with abdominal obesity, high muscle mass.