



ASCITIS

DEFINITION

- Ascites, from Greek askites, "bag like" is a gastroenterological term for detectable and accumulation of fluid in the peritoneal cavity.
- It is a common clinical finding with a wide range of causes, but develops most frequently as a part of the decompensation of previously asymptomatic chronic liver disease.





CAUSES OF ASCITES

- **A) Increased hydrostatic pressure or Venous Hypertension**
 - Cirrhosis of liver.
 - Hepatic vein occlusion or outflow obstruction (Budd- Chiari syndrome)
 - Inferior vena cava obstruction
 - Constrictive pericarditis
 - Congestive heart failure, or CCF.




□ **B) Decreased colloid osmotic pressure**

- End-stage liver disease with poor protein synthesis
- Nephrotic syndrome with protein loss
- Malnutrition
- Protein-losing enteropathy(Hypoalbuminemia)



□ **C) Increased permeability of peritoneal capillaries**

- Tuberculous peritonitis
 - Bacterial peritonitis
 - Malignant disease of the peritoneum
- 




□ **D) Leakage of fluid into the peritoneal cavity**

- Bile ascites(seepage of bile)
- Pancreatic ascites(pancreatic duct injury)
- Chylous ascites(accumulation of lipid rich lymph due to disruption of lymphatic system secondary to trauma and obstruction.)
- Urine ascites(Azotemia)



E) MISCELLANEOUS CAUSES

- Myxedema.
 - Ovarian disease (Meigs' syndrome)
 - Pseudomyxoma peritonei
 - Chronic hemodialysis
- 



PATHOPHYSIOLOGY

- Ascitic fluid can accumulate as a transudate or an exudate. Amounts of up to 35 liters are possible.
- Roughly, transudates are a result of increased pressure in the hepatic portal vein (>8 mmHg, usually around 20 mmHg, *e.g. due to cirrhosis*, while exudates are actively secreted fluid due to inflammation or malignancy.
- As a result, exudates are high in protein, high in lactate dehydrogenase, have a low pH (<7.30), a low glucose level, and more white blood cells. Transudates have low protein ($<30\text{g/L}$), low LDH, high pH, normal glucose, and fewer than 1 white cell per 1000 mm^3 . Clinically, the most useful measure is the difference between ascitic and serum albumin concentrations (SAAG). A difference of less than 1 g/dl (10 g/L) implies an exudate



Reason for abdominal distention

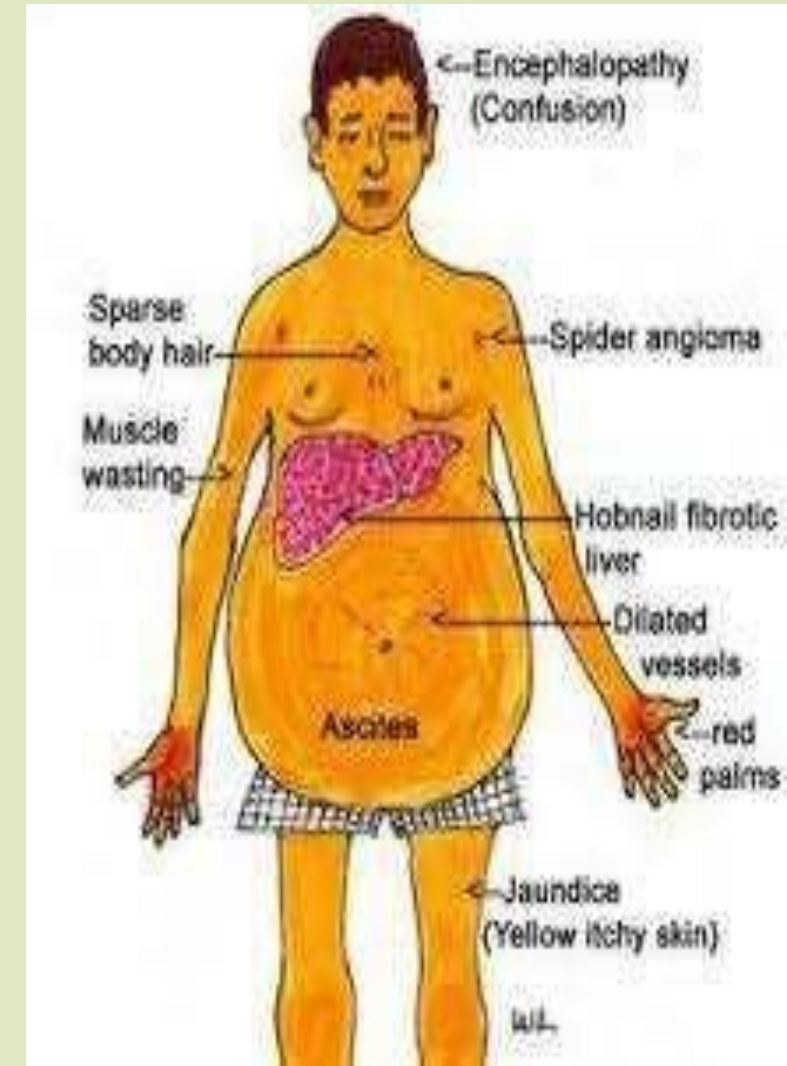
Remember 5F's

- Fat
- Flatulence
- Feces
- Fluid
- Fetus

Clinical Manifestations and Diagnosis

Symptoms

- Large and small amount of ascites
- Asymptomatic
- Abdominal distention and discomfort
- Anorexia
- Nausea
- Heartburn (Gastroesophageal Reflux)
- Flank pain
- Respiratory distress





Signs

- Umbilicus may everted.
- Bulging flanks with patient lying supine.
- Weight of ascitic fluid pushes against side walls.
- Tympany at the top of the abdominal curve.
- Patient lies supine.
- Gas filled bowel floats upward over ascites
- Fluid Thrill Wave Test 120 ml
- Shifting Dullness Test 500 ml.
- Puddle Sign 120 ml



GRADES OF ASCITES

- **Grade 1 :**

Mild ascites detectable only by ultrasound examination 100 ml and CT.

- **Grade 2:**

- Moderate ascites manifested by moderate symmetrical distension of the abdomen, detectable with flank bulging and shifting dullness.

- **Grade 3 :**

- Large or gross ascites with marked abdominal distension, directly visible, confirmed with the fluid wave/thrill test.



General examinations

- □ Enlarged lymph nodes : Suggestive of TB , leukaemia , malignancy , and lymphomas .
- □ Associated jaundice : Cirrhosis of liver .
- □ Dyspnoea , PND , orthopnoea , and oedema :congestive cardiac failure .
- □ Periorbital oedema , puffiness of face and oedema associated with ascites : acute nephritis nephrotic synd.
- □ Severe anaemia : Ascites of haematologic origin .
- □ Other signs of malnutrition with ascites : Kwashiorkor .



Systematic examination

- *Abdominal Examination*

- *Inspection*

- □ Abdomen is distended .

- □ Umbilicus is everted and slit transversely (laughing umbilicus)

- □ The distance between umbilicus and xiphisternum is more than the distance between umbilicus and pubic symphysis .

- □ Flanks are full. Nearly 1500 mL of fluid is required to make the flanks full .

- □ Veins are dilated over the abdomen .

- □ Scrotal oedema indicates nephrotic synd



ANALYSIS OF ASCITIC FLUID

Investigations:

- Peritoneal fluid analysis.(albumin,protein, Rbc,Wbc, differential PMN count.
- Other studies of Ascitic fluid**
- Lactate
- Alkaline phosphatase
- Amylase
- Cytology
- pH

1. The serum-ascitic albumin gradient (SAAG) :

- Best single test for classifying ascites into portal hypertensive (SAAG >1.1 g /dL) and non-portal hypertensive (SAAG <1.1 g /dL) causes.
- Calculated by subtracting the ascitic fluid albumin value from the serum albumin value,
- It correlates directly with portal pressure.
- The accuracy is approximately 97% .



DIAGNOSTIC PARACENTESIS

- 10 to 20 mL
- The bladder should be emptied prior to the procedure
- Most common Site
- left lower quadrant
- Other site
- 1. In the midline between the pubic-symphysis & umbilicus,
- 2. Right iliac fossa, lateral to the inf. epigastric artery or a few cm above the inguinal lig.
- Z-technique

Therapeutic Paracentesis

- initially the recommendation was to perform daily 5-L paracentesis until the disappearance of ascites, it was subsequently determined that total paracentesis (i.e. removal of all ascites in a single procedure accompanied by the concomitant infusion of 6–8 g albumin per liter of ascites removed) was as safe as repeated partial paracentesis.





Differences between

Transudative

- ❑ Fluid pushed through the capillaries due to high pressure within the capillary.
- ❑ Serum Albumin - Ascites Albumin >1.1 gm/dl
- ❑ Can be due to portal hypertension, CHF, and Hypoalbuminemia.
- ❑ Gross appearance- watery, clear.
- ❑ Specific gravity-<1015
- ❑ Protein-< 3mg/dl
- ❑ Cells: usually benign, few mesothelial cells, histocytes and lymphocytes.

EXUDATIVE

- ❑ Fluid that leaks around the cell of the capillaries caused by inflammation.
- ❑ Serum Albumin - Ascites Albumin <1.1 gm/dl
- ❑ Can be secondary to malignancy, infection, or inflammation.
- ❑ Turbid or Husk colour.
- ❑ More than 1015
- ❑ > 3mg/dl
- ❑ Cells: more mesothelial cells, acute or chronic inflammatory cells, Rbc's and malignant cells.

SYSTEMIC EXAMINATION

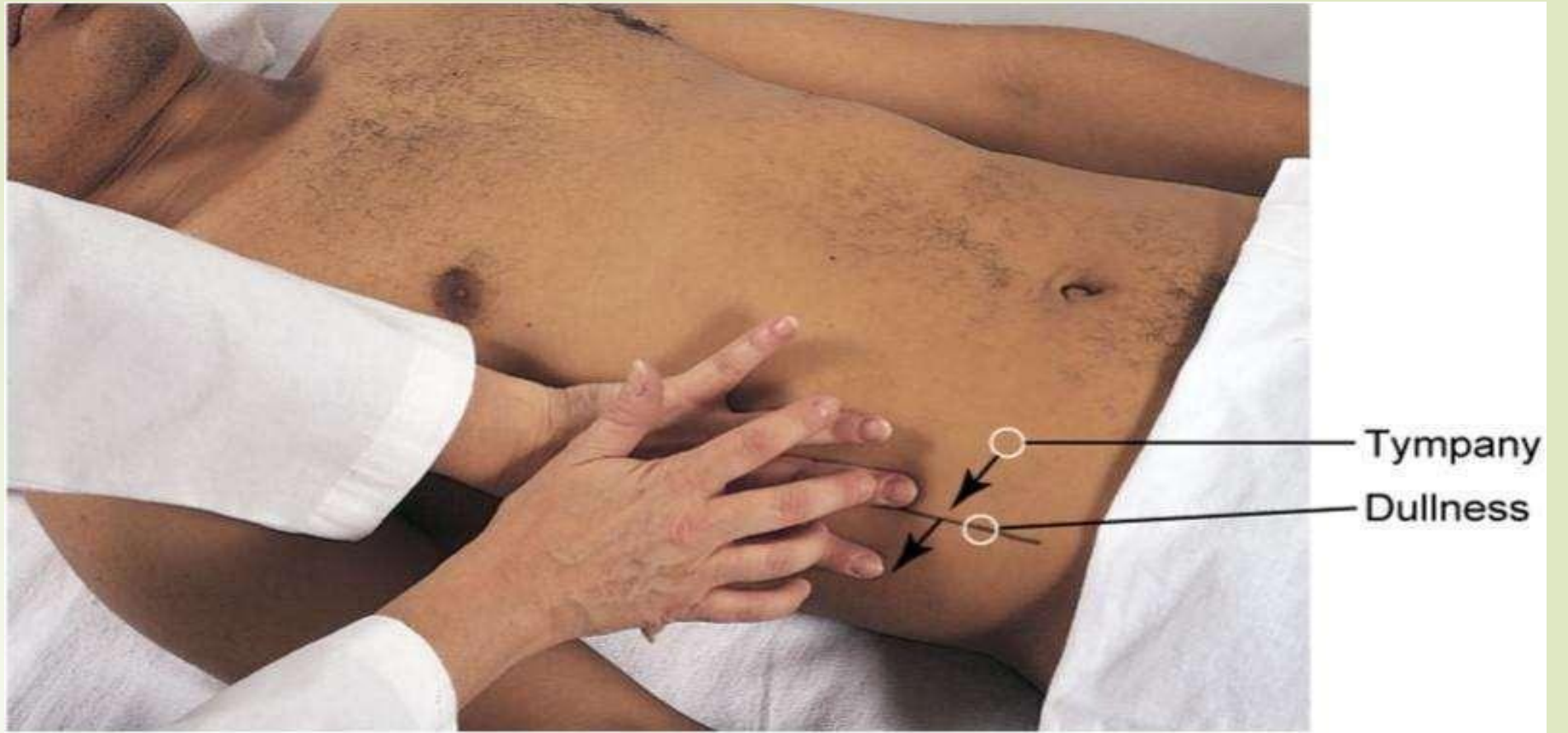
□
INSPECTI
ON



□ PALPATION



PERCUSSION



Copyright © 2012, 2008, 2004, 2000, 1996, 1992 by Saunders, an imprint of Elsevier Inc. All rights reserved.

IMAGING STUDIES

Ultrasonography:

- Volumes as small as 5- 10 mL can routinely be visualized.
- With massive ascites, the small bowel loops have a characteristic polycyclic, "lollipop," appearance
- The smallest amounts of fluid tend to collect in the Morison pouch and around the liver as a sonolucent band.

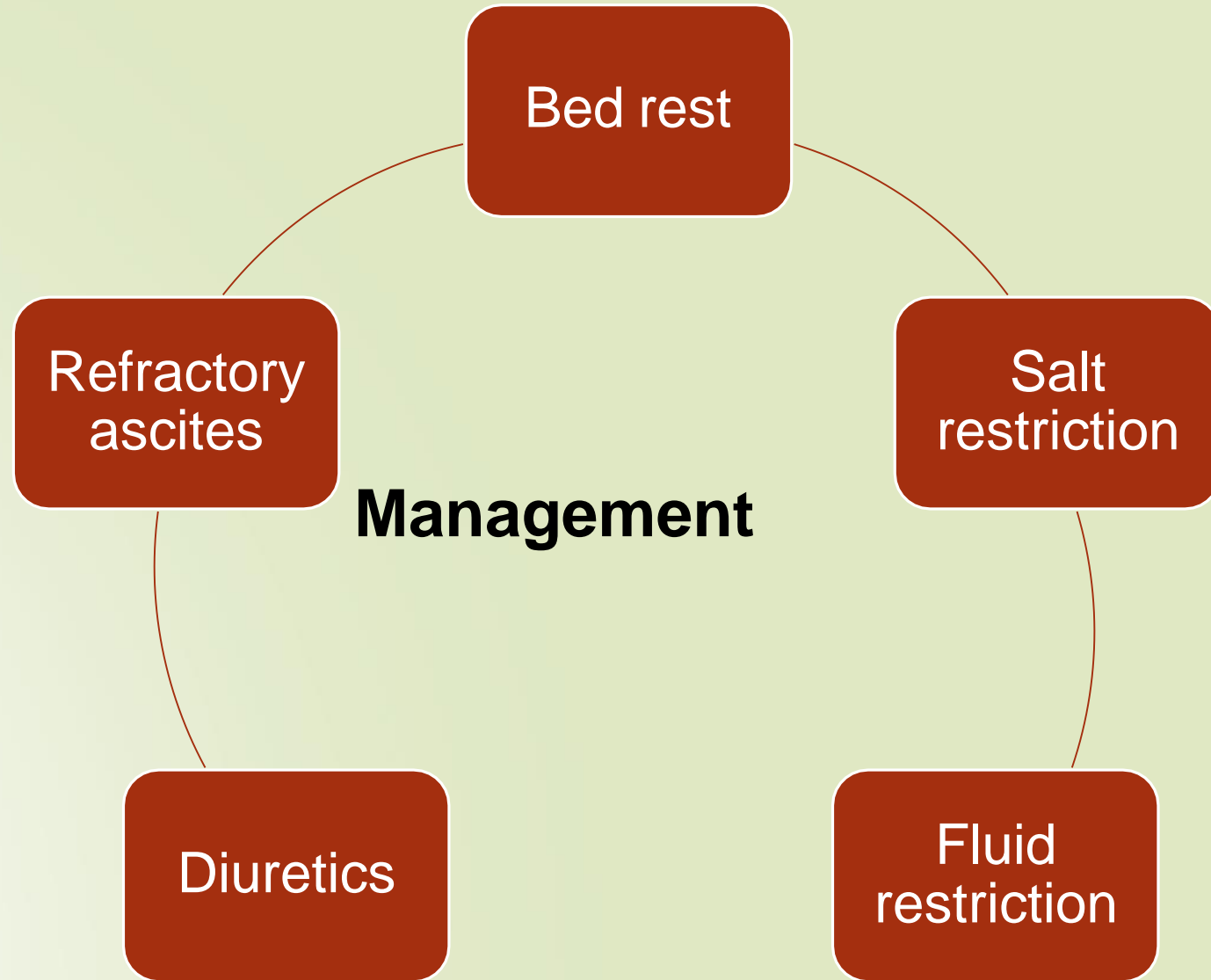


CT Scan:

- Ascites is demonstrated well on CT scan.
- □ A number of CT scan features suggest neoplasia. Hepatic, adrenal, splenic, or lymph node lesions associated with masses arising from the gut, ovary, or pancreas are suggestive of malignant ascites.



Management of ascites





complications

1. Infection & peritonitis
2. Bladder or bowel perforation
3. Hypovolaemia & shock (>1 lit. remove rapidly), especially if the patient does not have oedema
4. Blockage of needle.
5. Spontaneous bacterial peritonitis (SBP)
6. Hydrothorax
7. Gastro-oesophageal reflux
8. Respiratory distress and atelectasis due to
9. Elevation of diaphragm
10. Scrotal oedema
11. 7. Collection of fluid in the pleural sac
12. Mesenteric venous thrombosis
13. Functional renal failure.



Treatment

- Patients with **moderate ascites can be** treated as outpatients and **do not require hospitalization unless they have other complications of cirrhosis.**
- Since the development of grade 2 or 3 ascites in patients with cirrhosis is associated with reduced survival, **liver transplantation should be considered as** a potential treatment option



Treatment of high SAAG ascites

1 Medical

A) Diet.

B) Diuretics.

C) Therapeutic paracentesis

2 Surgical


TIPS



Liver transplantation

Peritoneovenous shunting

Diuretics

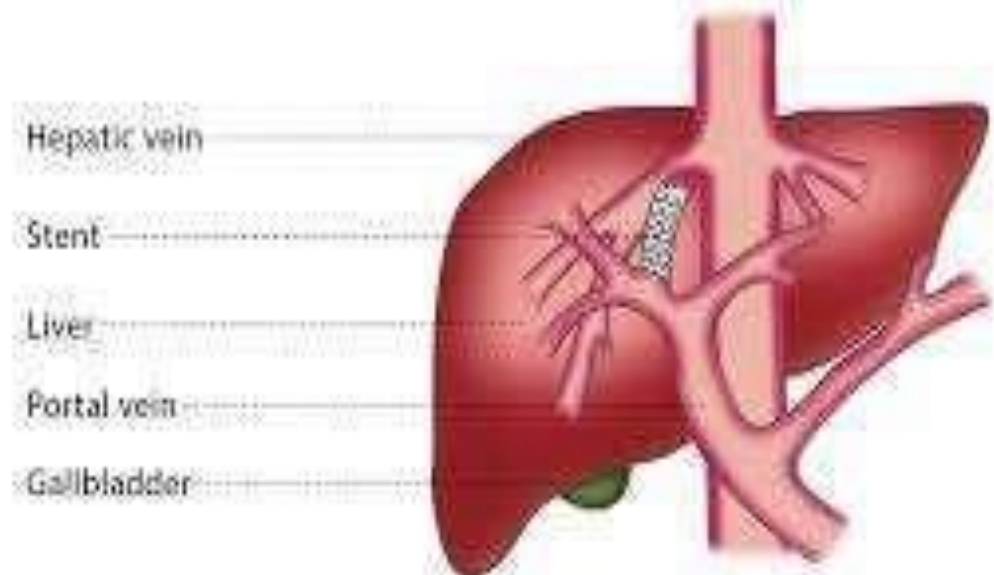
- Aldosterone antagonist, acting mainly on the distal tubules as Potassium-sparing diuretic (inhibit Na^+ re-absorption and K^+ excretion).
- **Spirolactone:** drug of choice in the initial treatment.
- Side effects are those related to its anti-androgenic activity, such as decreased libido, impotence, and gynaecomastia in men and menstrual irregularity in women.
- **Furosemide** is a loop diuretic that generally used as an adjunct to spironolactone .
- it inhibit re-absorption of $\text{Na}^+/\text{K}^+ / 2\text{Cl}^-$ in the ascending limb of the loop of Henle.
- High doses are associated with severe electrolyte disturbance and metabolic alkalosis, and should be used cautiously.

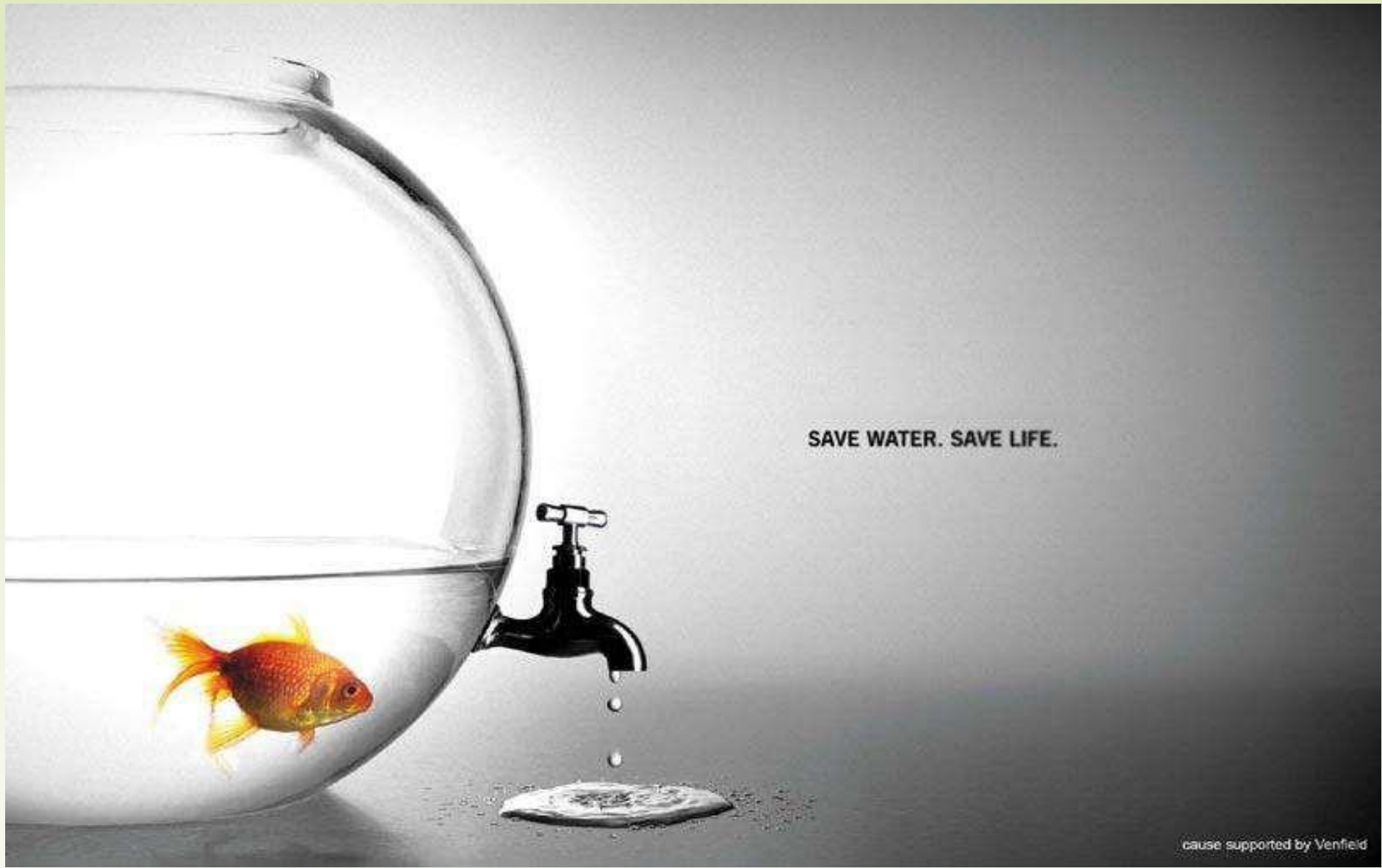
- 
- and Amiloride and triamterene act on the distal tubule. It blocks Na reabsorption and induces diuresis in 80% of patients at doses of 15–30 mg/day.
 - less effective compared with spironolactone.
 - Bumetanide is similar to frusemide in its action and efficacy
 - Torsemide are drugs of choice further.
 - Usual maximum doses are 400 mg/day of spironolactone and 160 mg/day of furosemide.
 - Overdose leads to intravascular volume depletion leading to renal impairment, hepatic encephalopathy, and hyponatraemia.

- 
- 
- All diuretics should be discontinued if there is`
 1. Severe hyponatremia(135-145) (serum sodium concentration <120 mmol/L),
 2. Progressive renal failure,
 3. Hepatic encephalopathy(loss of brain function when liver)
 4. Incapacitating muscle cramps

- Peritoneal tap
- albumin infusion
- Transjugular intrahepatic portosystemic shunt (TIPS)
- Liver transplant

Transjugular intrahepatic portosystemic shunt (TIPS)





SAVE WATER. SAVE LIFE.

cause supported by Venfield