Acute Pancreatitis

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Pancreatitis is Inflammation of Pancreas
Can be Acute / Chronic

Atlanta Classification

Mild: Pancreatitis without evidence of Parenchymal necrosis

Severe: - Organ Failure

- Systolic pressure < 90 mmHg
- PaO2 ≤ 60 mmHg
- Serum Creatinine > 176.8 µmol/L
- Gastrointestinal bleeding > 500ml/24 hrs.

- Local Complications
  - -Necrosis, pseudocyst formation, abscess
- Ranson Score > 3

- *APACHE II* score >8

Necrotizing: Presence of diffuse or focal area of non-viable pancreatic or peri-pancreatic parenchyma

Etiology

Causes of Acute Pancreatitis

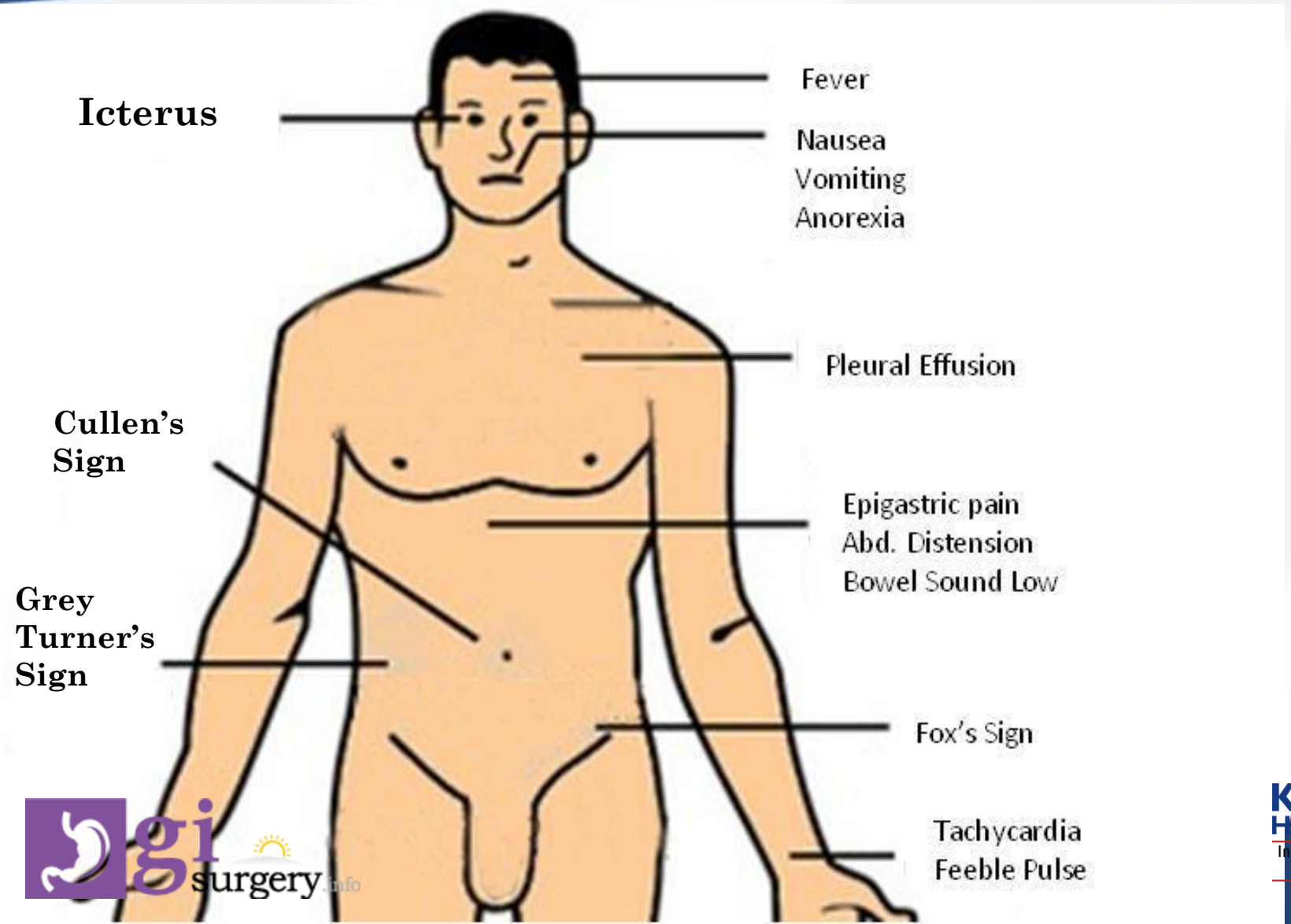
Gallstones and microlithiasis
Alcohol abuse
Drugs
ERCP
Hyperlipidemia
Hypercalcaemia
Autoimmune Pancreatitis
Idiopathic
Infections
Genetic

Drugs

- Prednisolone
- Azathioprine
- Didanosine
- Estrogen
- Pentamidine
- Sodium Valproate
- L-Asparaginase

- Postsurgical
- Cystic lesions of Pancreas
- Cystic Fibrosis
- Pancreas Divisum
- Pancreatic Cancer
- Penetrating Peptic Ulcer
- Trauma
- Vasculitis

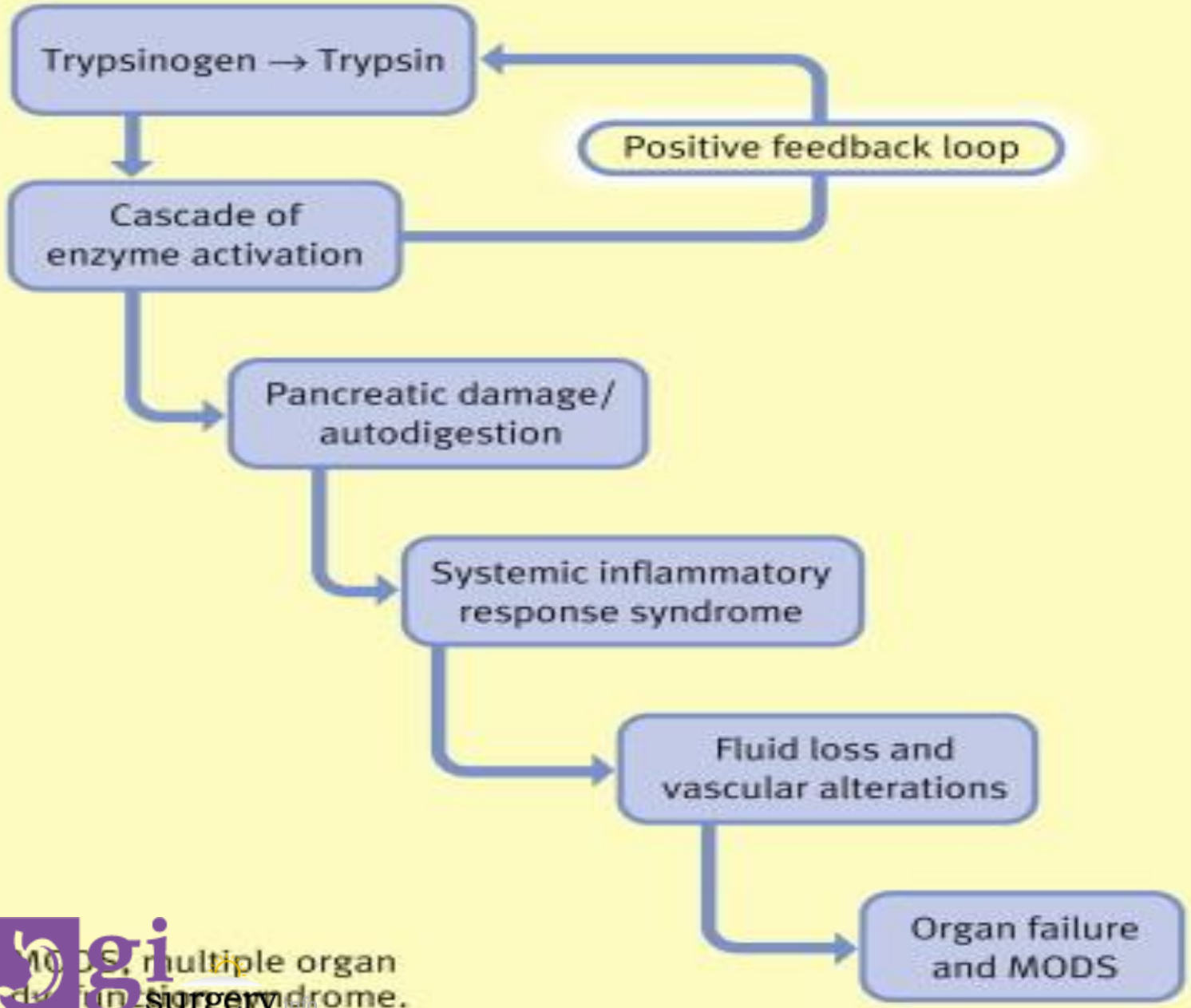
Clinical Features



Abdominal Pain	Nausea
Vomiting	Anorexia
Trigger Position	Abdominal Defense
Abdominal distension	Decreased bowel sounds
Fever	Pleural effusions
Ascites	Jaundice
Shock	Vascular Collapse
Pulmonary edema	Hypotension
Tachycardia	Tachypnea
Hypoxemia	Oligoanuria
Respiratory distress	Abdominal ecchymosis

Cullen's and Gray Turner's Sign

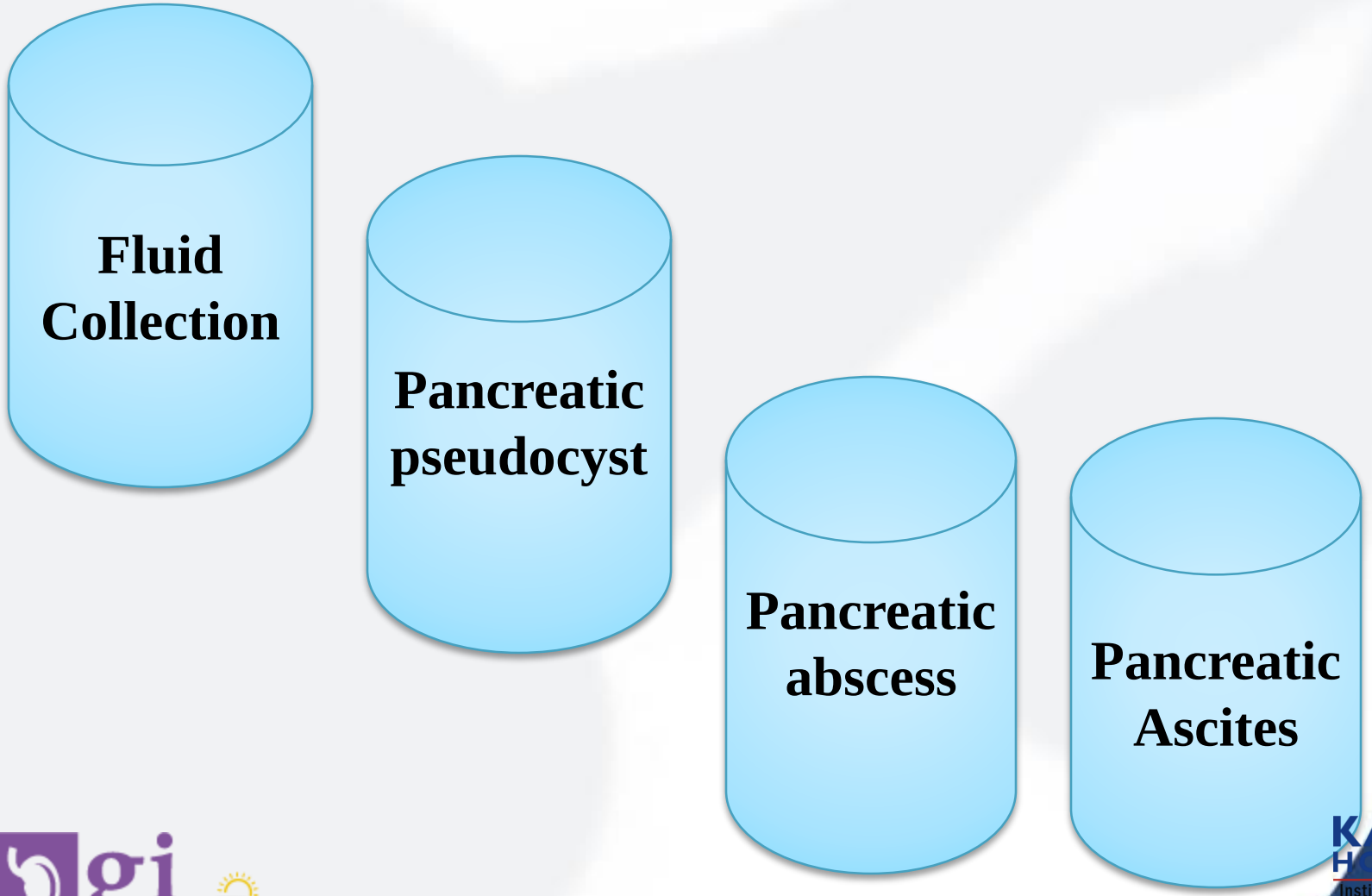
Pathogenesis of acute pancreatitis



MODS, multiple organ dysfunction syndrome.

surgery

Complications - *Local*



Complications - *Local*

Involvement of adjacent organs

- **Hemorrhage**
- **Thrombosis**
- **Bowel infarction**
- **Obstructive jaundice**
- **Fistula formation**
- **Mechanical obstruction**

Complications-Systemic

Pulmonary

- Pneumonia, Atelectasis
- Acute respiratory distress syndrome
- Pleural effusion

Cardiovascular

- Hypotension
- Hypovolemia
- Pericardial effusion

Complications-Systemic

Hematologic

- Hemoconcentration
- Disseminated intravascular coaugalopathy

GI Hemorrhage

- Peptic ulcer
- Erosive gastritis
- Portal vein or splenic vein thrombosis with varices

Fat necrosis

- Oliguria
- Azotemia
- Renal artery/vein thrombosis

Complications-Systemic

Metabolic

- Hyperglycemia
- Hypocalcemia
- Hypertriglyceridemia
- Encephalopathy
- Sudden blindness (Purtscher's retinopathy)

Central nervous system

- Psychosis
- Fat emboli
- Alcohol withdrawl syndrome

Fat necrosis

- Subcutaneous tissue necrosis
- Intra-abdominal saponification

Diagnosis

- ***S. Amylase*** – Highly sensitive, but low specificity
- ***S. Lipase*** - highly specific for pancreatitis
- ***Ultrasound*** - initial screening, may be negative
- ***CECT Scan*** - definitive for diagnosis
- ***MRCP*** - noninvasive, less used in acute pancreatitis
- ***ERCP*** - therapeutic intervention can be done
- ***Endoscopic Ultrasound*** - rarely used in acute setting

Differential Diagnosis of Acute Pancreatitis

Disease

- Perforated Viscus, Especially Peptic Ulcer
- Acute Cholecystitis and Biliary Colic
- Intestinal Obstruction
- Mesenteric Vascular occlusion
- Dissecting aortic aneurysm

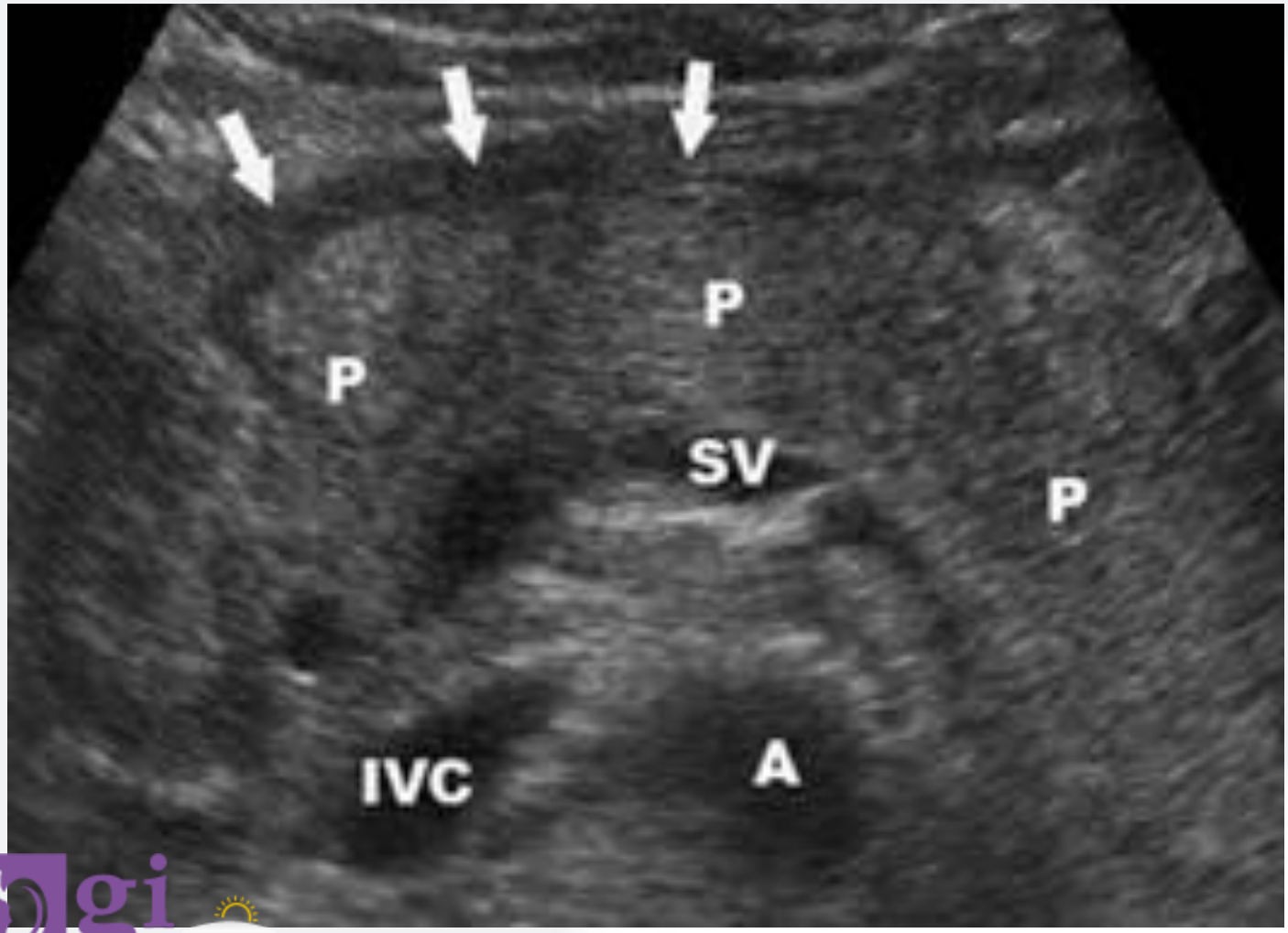
Differential Diagnosis of Acute Pancreatitis

Disease

- Renal Colic
- Myocardial Infarction
- Connective Tissue disorder with Vasculitis
- Appendicitis
- Ectopic Pregnancy
- Pneumonia

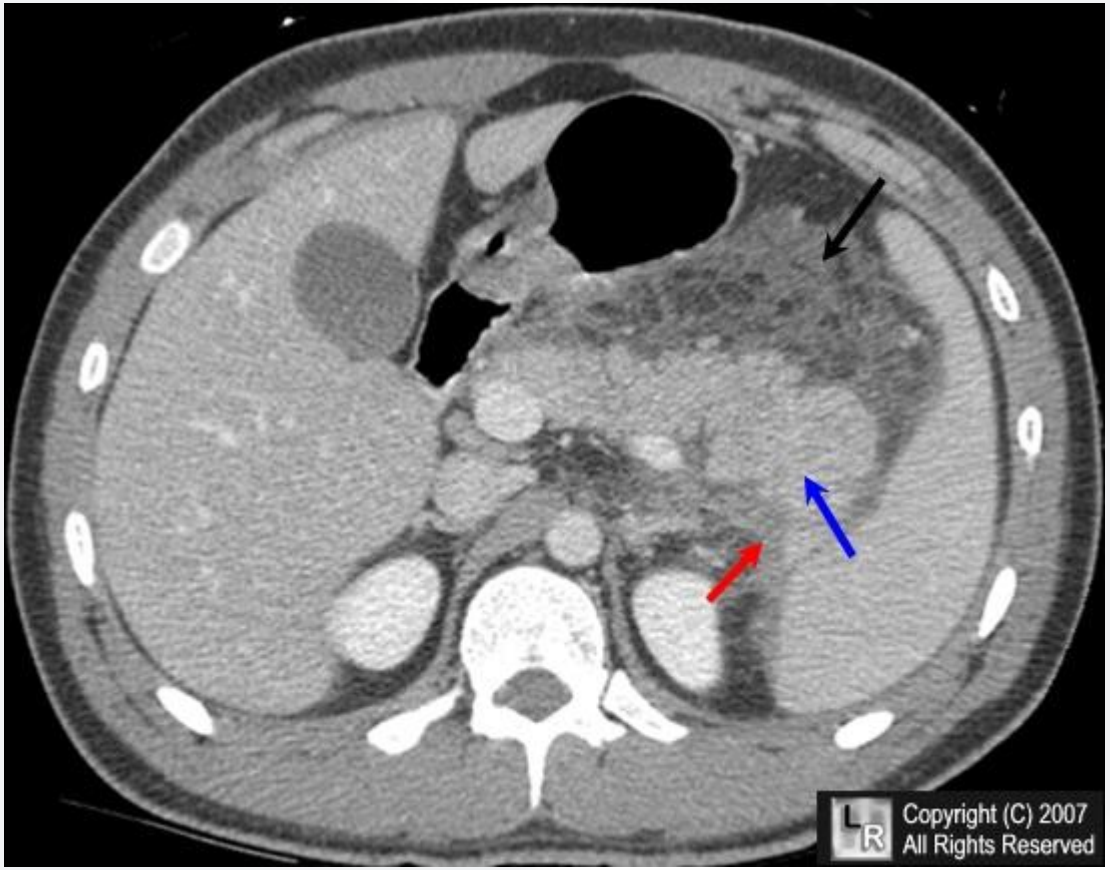
Plain X-ray of Abdomen showing Colon cutoff sign

USG IMAGE OF EDEMATOUS PANCREAS WITH PERIPANCREATIC FLUID

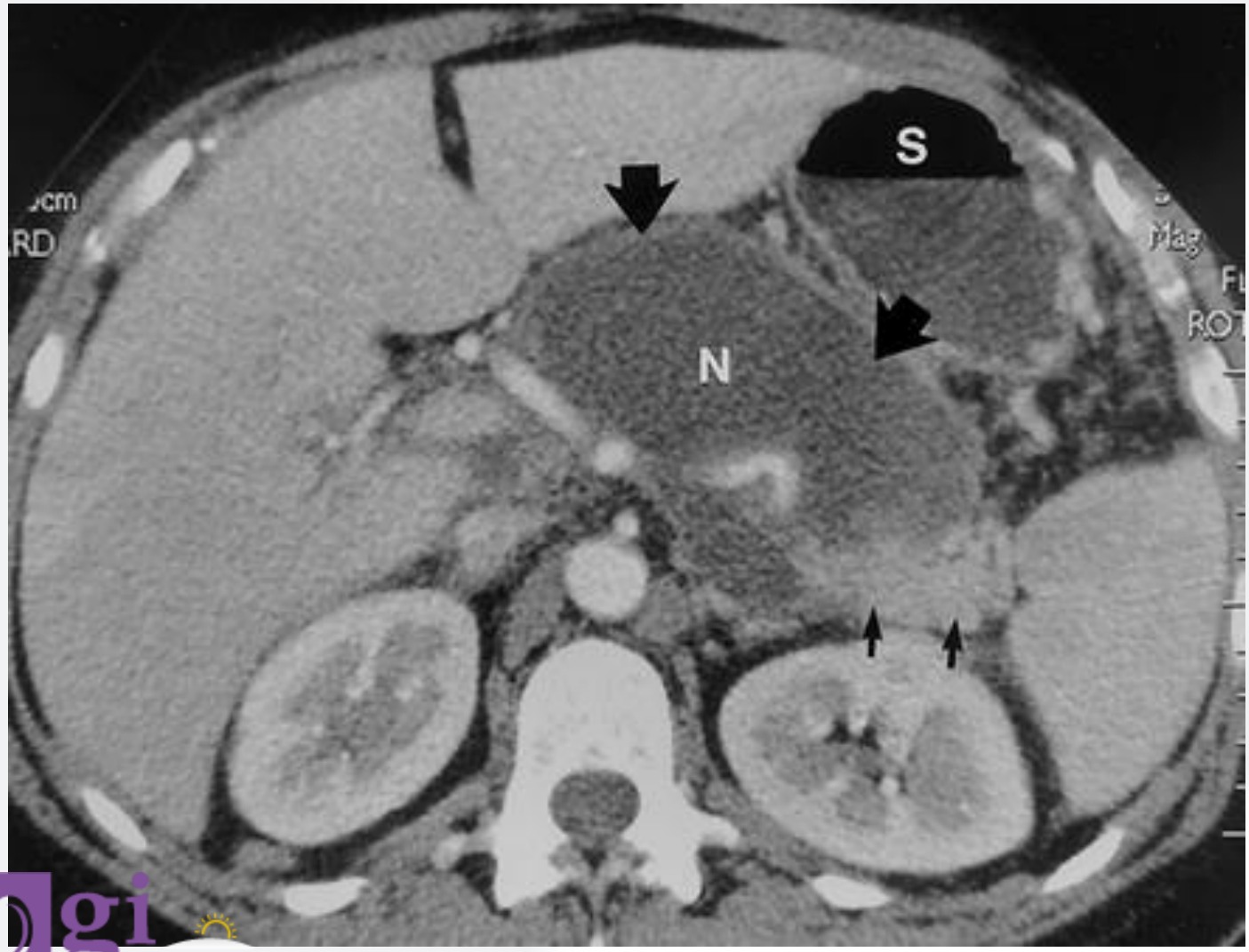


CECT Abdomen showing Hazy Border of Pancreas with Edematous Parenchyma

CECT Abdomen showing changes of Acute Pancreatitis with Peripancreatic Fat stranding and Gland Enlargement



CT Scan showing Extensive necrosis in Head and body of Pancreas with Preserved Tail region



Coronal Section of Abdomen CT Scan showing Large pseudocyst

PROGNOSTIC INDICATORS

Ranson's Criteria

- Present on Admission-
- Blood glucose greater than 200 mg/dl
- Age greater than 55 years
- Serum LDH greater than 350 I.U. /L
- SGOT (AST) greater than 250 I.U. /L
- WBC greater than 16,000/ul
- NB- Amylase is not one of Ranson's criteria

Developing During the first 48 hours: -

- Serum calcium less than 8 mg/dl
- Haematocrit fall greater than 10%
- Arterial oxygen saturation less than 60 mm Hg
- BUN increase greater than 8 mg/L
- Base deficit greater than 4 Meq/L
- Estimated fluid sequestration greater than 600 ml

Prognostic Indicators

CT Severity Index (CTSI)

Balthazar		
– Normal pancreas	A	0
– Enlargement	B	1
– Inflammation of pancreas and fat	C	2
– Single fluid collection	D	3
– Two or more fluid collections	E	4
Necrosis		
– < 30%		2
– 30-50%		4
– > 50%		6

Max = 10 points

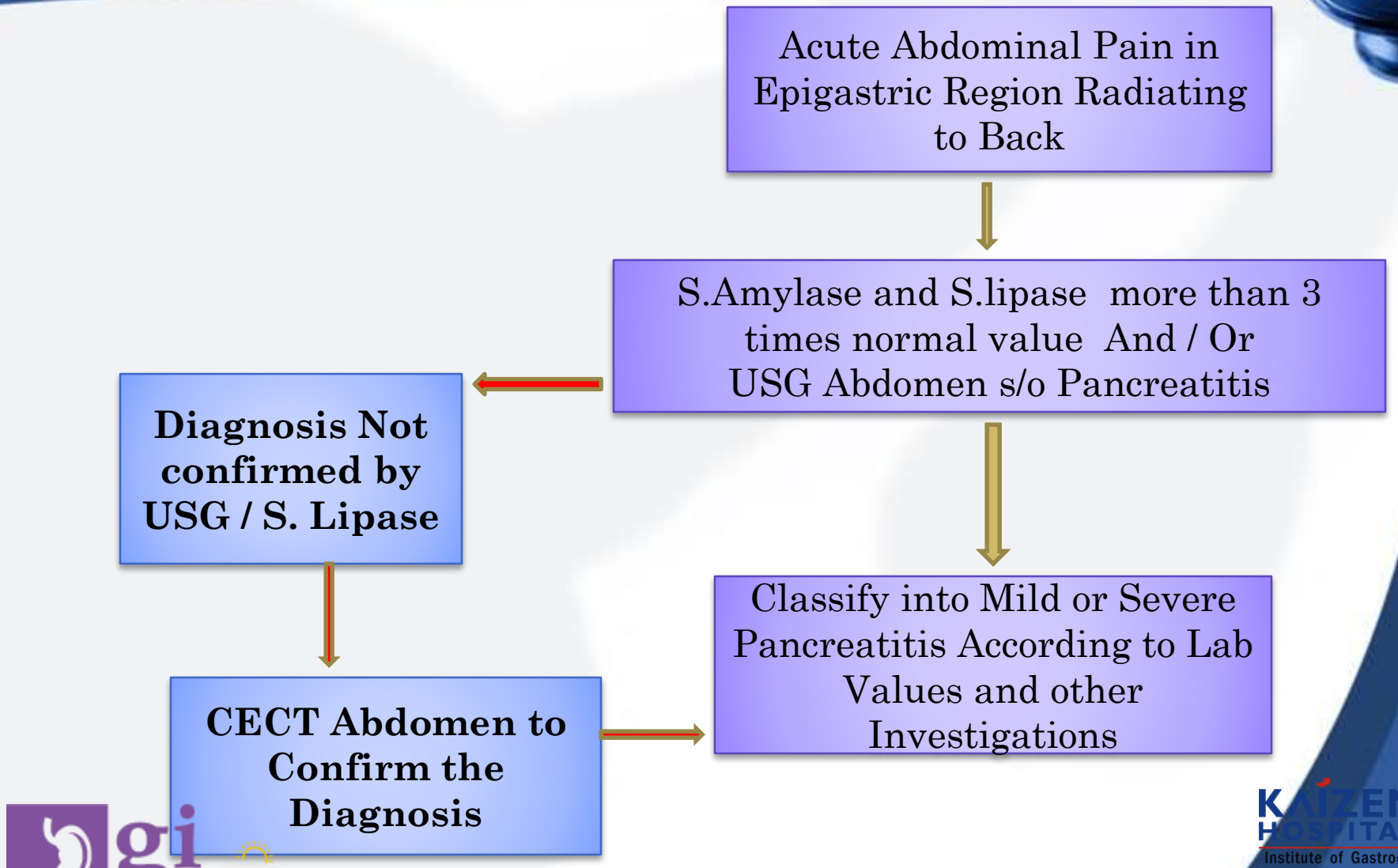
Laboratory Studies*	Acute Physiology Scores for Specific Parameters				
	0	1	2	3	4
Temperature (°C)	36.0–38.4	38.5–38.9, 34.0–35.9	39.0–39.9, 32.0–33.9	40.0–40.9, 30.0–31.9	>40.9, <30.0
Mean arterial BP (mm Hg)	70–109	· · ·	110–129, 50–69	130–159	>159, <50
Heart rate (beats per minute)	70–109	· · ·	110–139, 55–69	140–179, 40–54	>179, <40
Respiratory rate (breaths per minute)	12–24	25–34, 10–11	6–9	35–49	>49, ≤5
$P_{AO_2} - Pa_{O_2}$ (mm Hg)	<100	61–70	200–349	350–499, 55–60	>499, <55
Serum bicarbonate† (mmol/L)	23.0–31.9	32.0–40.9	18.0–22.9	41.0–51.9, 15.0–17.9	>51.9, <15.0
Arterial pH	7.33–7.49	7.50–7.59	· · ·	7.60–7.69	>7.69, <7.15
Serum sodium (mmol/L)	130–149	150–154	155–159, 120–129	160–179, 111–119	>179, <111
Serum potassium (mmol/L)	3.5–5.4	5.5–5.9, 3.0–3.4	2.5–2.9	6.0–6.9	>6.9, <2.5
Serum creatinine (mg/dL)	0.6–1.4	· · ·	1.5–1.9, <0.6	2.0–3.4	>3.4
Hematocrit (%)	30.0–45.9	46.0–49.9	50.0–59.9, 20.0–29.9	· · ·	>59.9, <20.0
WBC count ($\times 10^3/mm^3$)	3.0–14.9	15.0–19.9	20.0–39.9, 1.0–2.9	· · ·	>39.9, <1.0

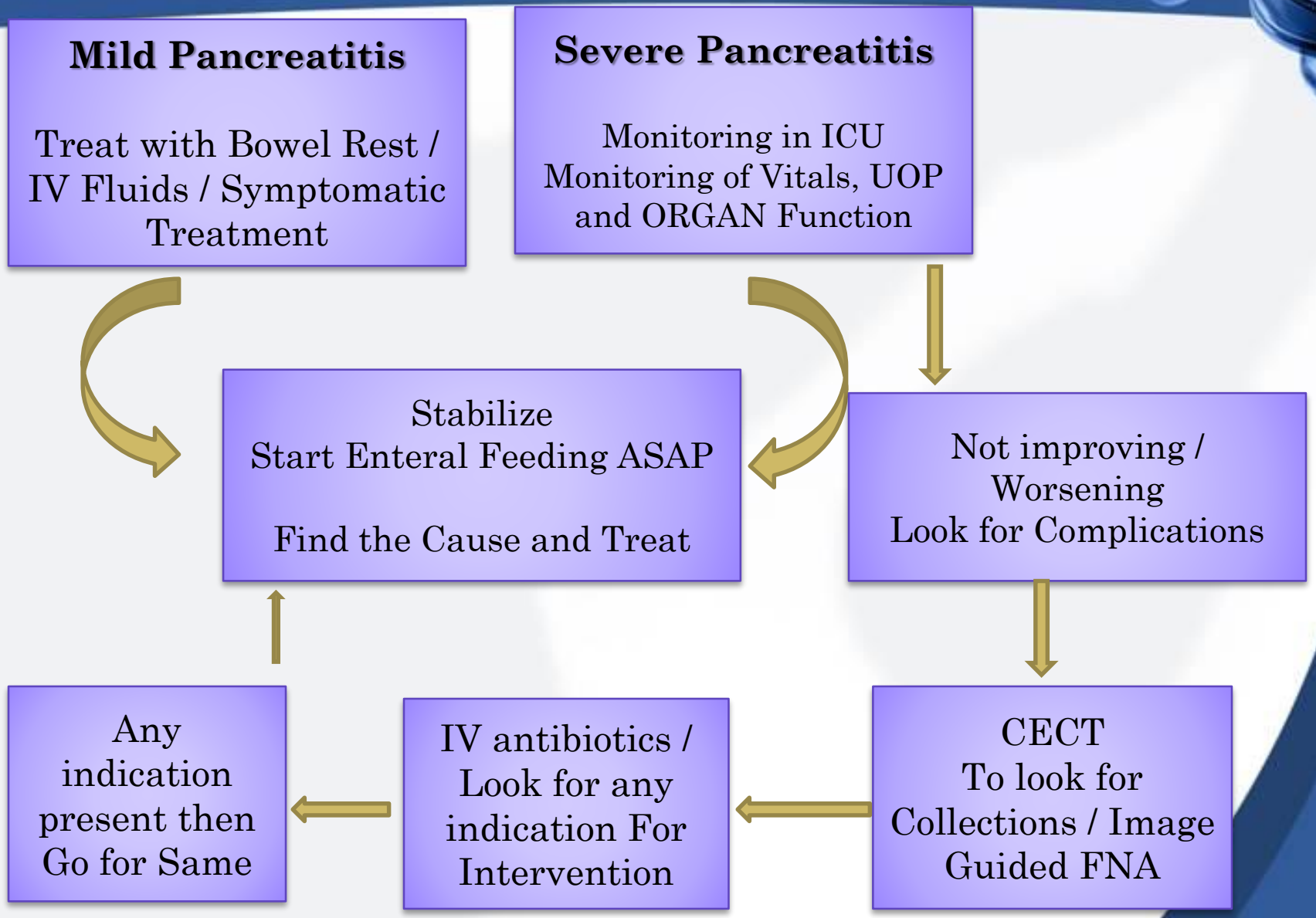
BISAP Score

BISAP-Bedside Index for Severe Acute Pancreatitis

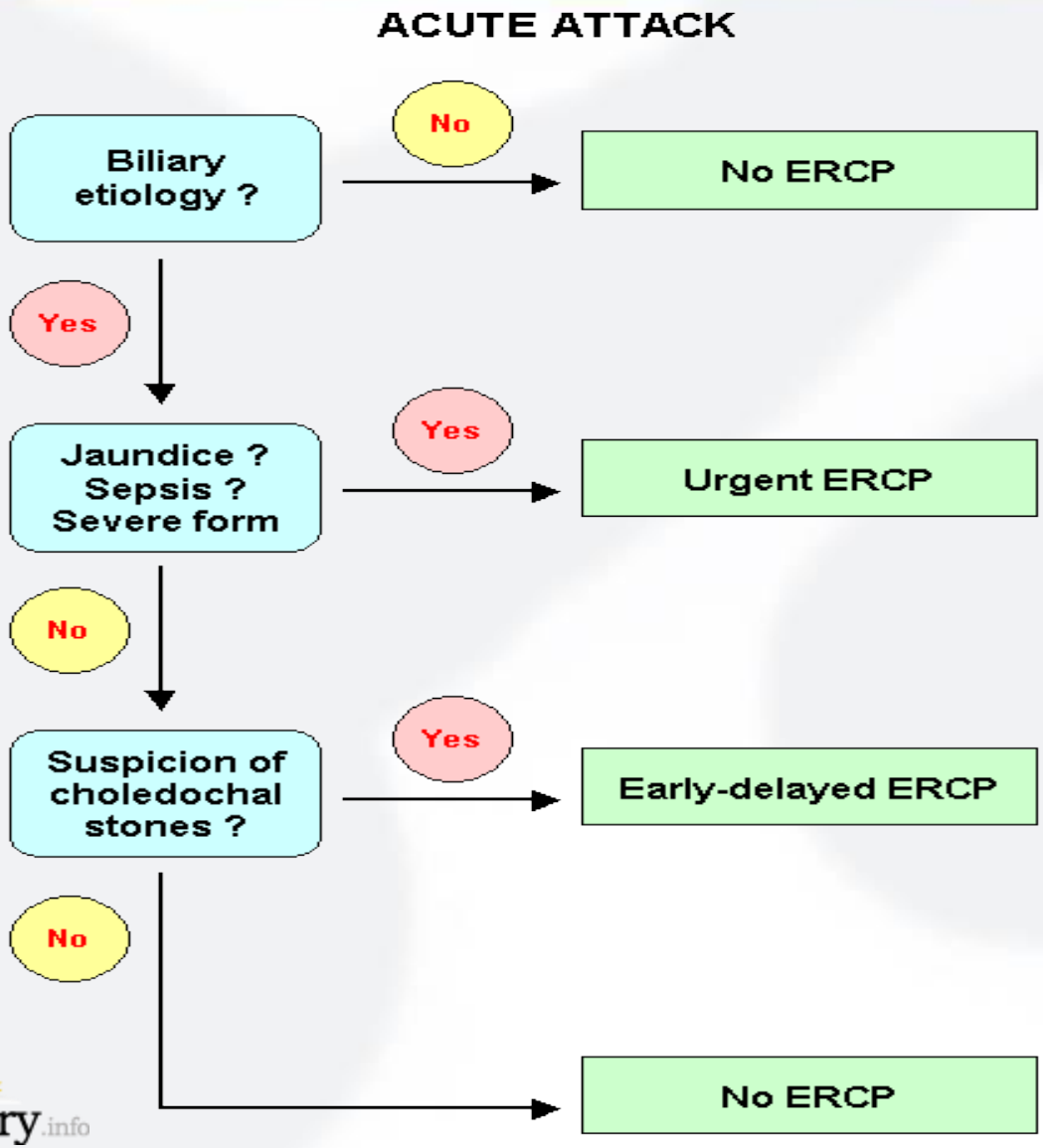
(B) Blood Urea Nitrogen (BUN) > 22 mg %
(I) Impaired Mental Status
(S) SIRS : 2/4 Present
(A) Age > 60 years
(P) Pleural Effusion

Approach to patient with suspected Pancreatitis




Mild Pancreatitis
Treat with Bowel Rest / IV Fluids / Symptomatic Treatment
Severe Pancreatitis
Monitoring in ICU
Monitoring of Vitals, UOP and ORGAN Function
Stabilize
Start Enteral Feeding ASAP
Find the Cause and Treat
Not improving / Worsening
Look for Complications
CECT
To look for Collections / Image Guided FNA
IV antibiotics / Look for any indication For Intervention
Any indication present then Go for Same

Approach to Gallstone Pancreatitis



ROLE OF ANTIBIOTICS

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- In severe acute pancreatitis-to treat secondary pancreatic infections
- Infected pancreatic necrosis –imaging directed FNA with culture
- Prophylactic antibiotics- not proven efficacious

Role of Antibiotics

- Empiric Therapy- if higher degree of suspicion of infection till cultures are available
- Along with Intervention to control local sepsis
- American Guidelines- Antibiotics for > 30 % necrosis, not more than 14 days
- Italian Guidelines- antibiotics for any patient with CT proven necrosis

ROLE OF NUTRITION

- An elemental formula is useful for patients with significant intestinal maldigestion.
- If enteral feeding is not feasible within 5-7 days, (additional) parenteral nutrition has to be considered
- Individualized-primary enteral-nutritional support is an essential part of a multimodal therapy in severe acute pancreatitis and it improves clinical outcome.

ROLE OF NUTRITION

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- Early enteral nutrition always better
- Usually, gastric enteral nutrition with a polymeric formula via a nasogastric tube is possible
- only in a minority of patients is jejunal feeding necessary owing to the high gastric residual volume.

INTERVENTION

Intervention may be required in some cases of severe pancreatitis

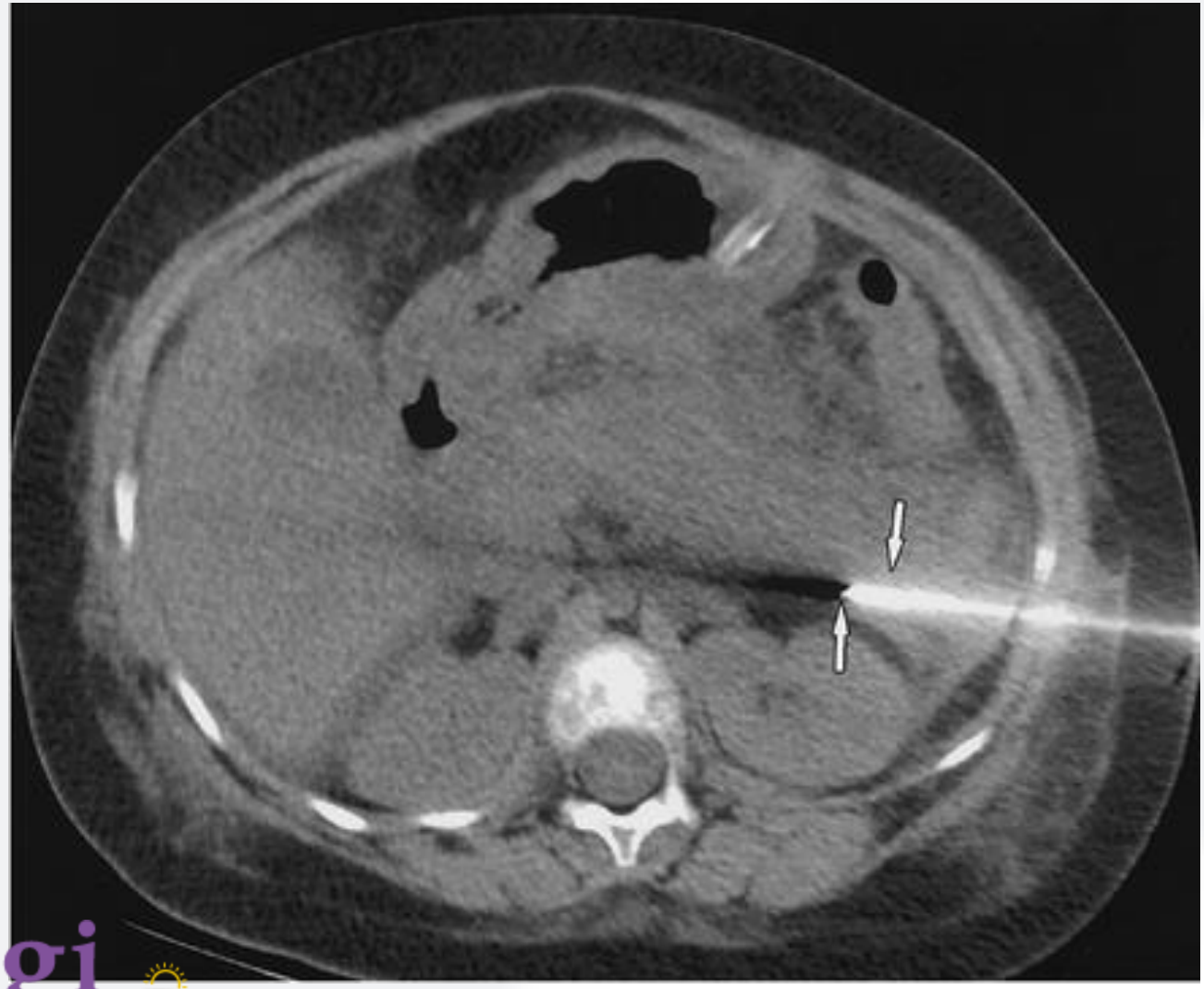
- i.e. in case of proven infected necrosis
- In suspected case of infected necrosis showing no improvement or even worsening
- Causing abdominal compartment syndrome
- Complications of Pancreatitis

PERCUTANEOUS DRAINAGE

- Suspected infected pancreatic necrosis
  - Clinical instability
  - Sepsis
  - Increasing white blood cell count
  - Fever-not resolving with higher antibiotics

- Imaging guided Percutaneous aspiration with gram's stain and culture is recommended

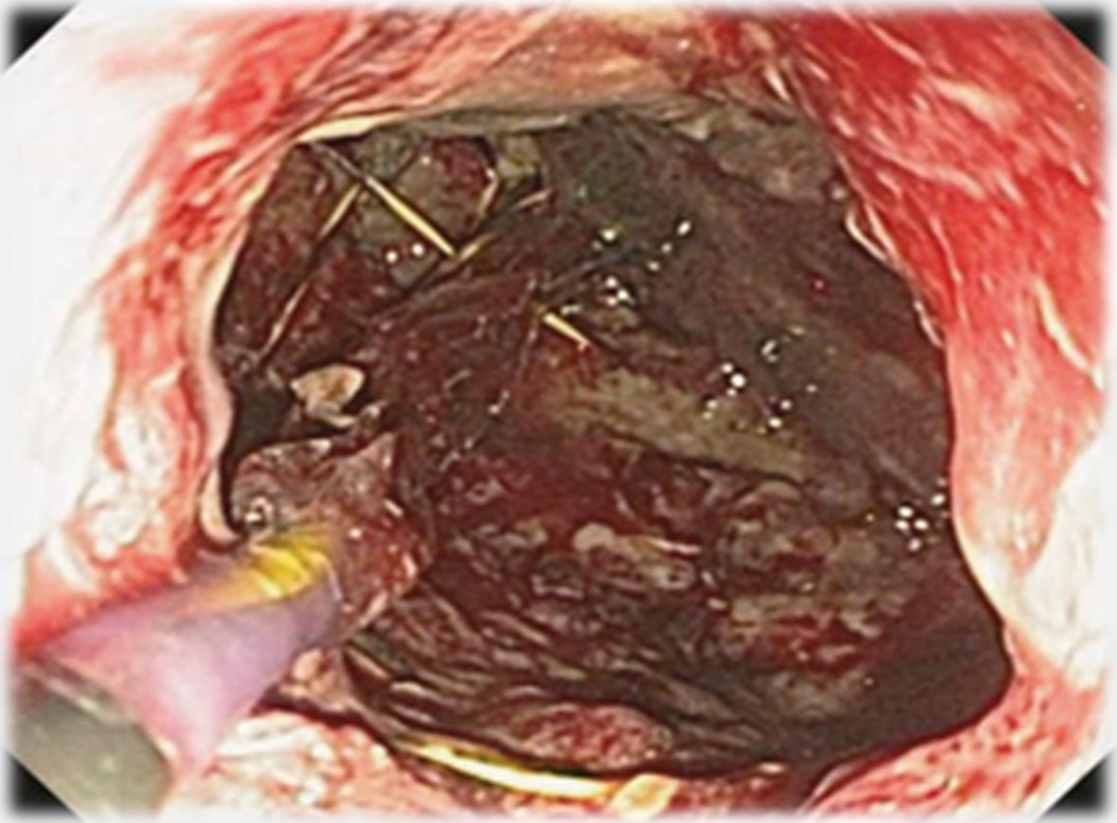
CT image showing localization of Pancreatic abscess and Needle inside Abscess cavity



NECROSECTOMY

- Indications
  - Infected pancreatic necrosis
  - Sterile symptomatic pancreatic necrosis with abdominal pain preventing oral intake

- Approach
  - Open Laprotomy
  - Minimal Invasive
    - Retroperitoneoscopic
    - Endoscopic

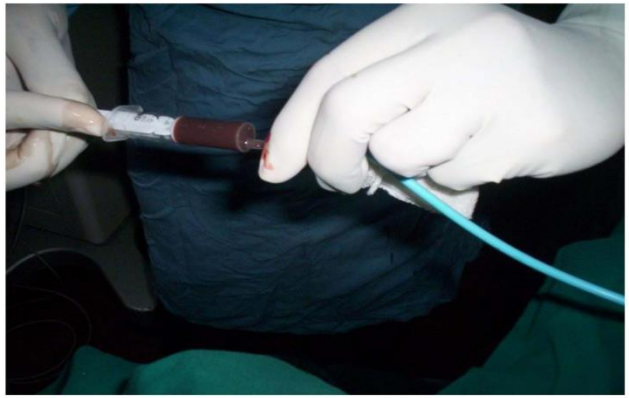


The above image shows endoscopic debridement of pancreatic necrosis.

Retroperitoneoscopic Minimal Invasive Pancreatic Necrosectomy

Marking the site CT guided

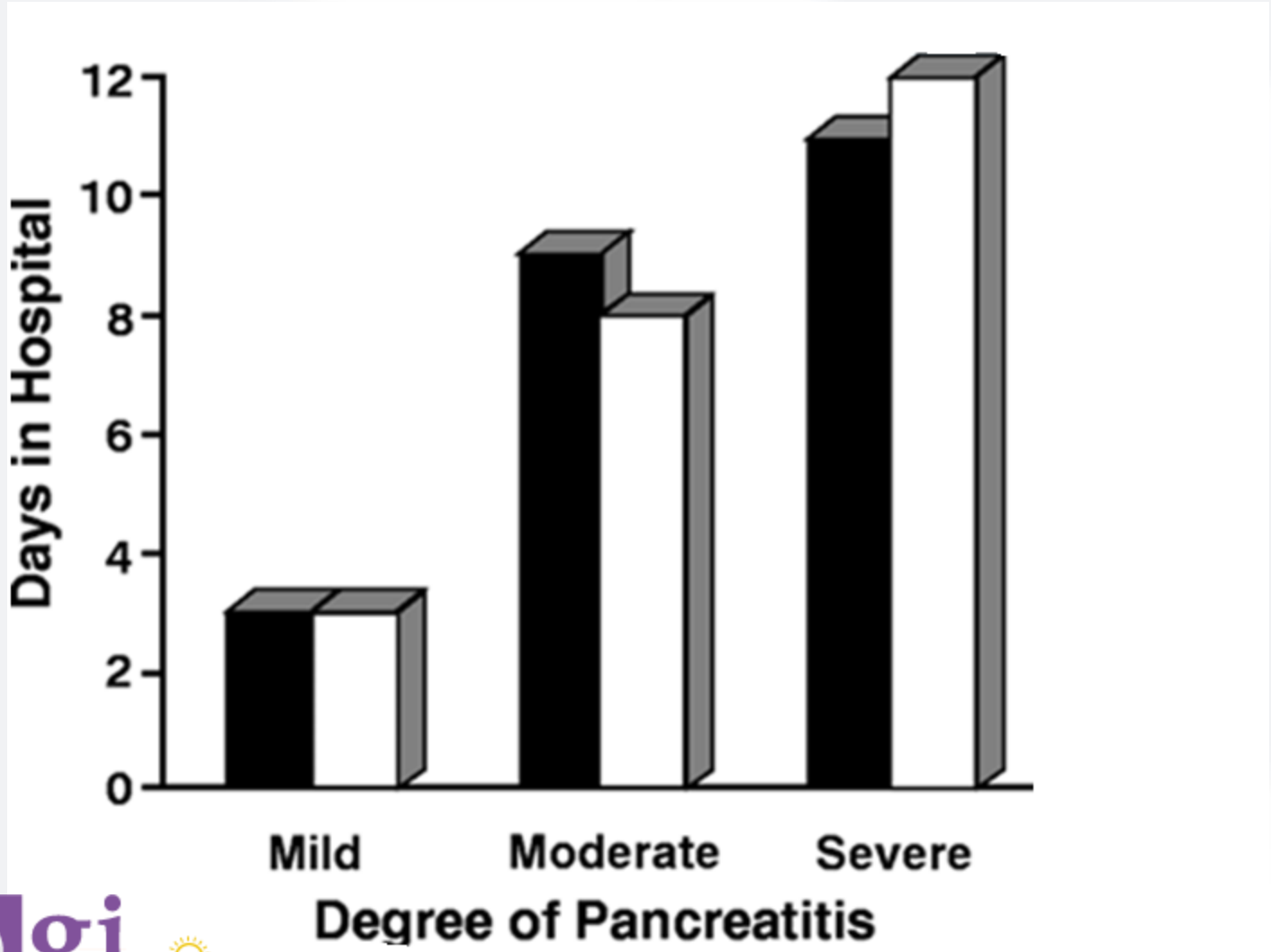
Insertion of CT guided Catheter



Confirming the Location

Laprotomy through Transverse incision for Relieving Abdominal Compartment syndrome in Acute Pancreatitis

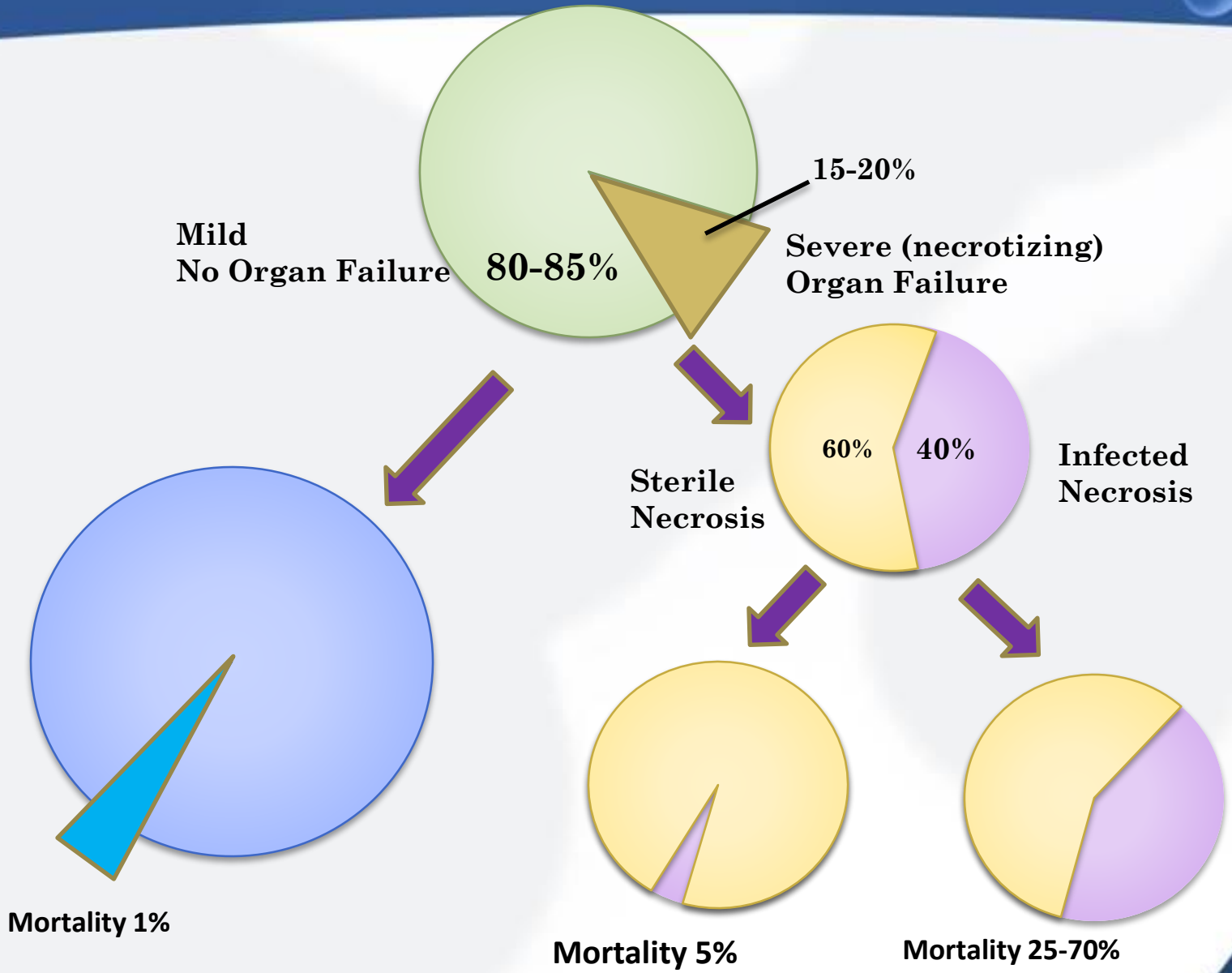
Outcome of Acute Pancreatitis



Outcome of Acute Pancreatitis

	MILD 80%		Severe 20%
	Interstinal	**Exudative**	**Necrotic**
Pancr. Necrosis	No	No	Yes
Collections	No	Yes	Usually
Complications	No	12%	82%
Mortality	< 1%	< 8%	10-23%

Outcome of Acute Pancreatitis



CONCLUSION

- Acute severe pancreatitis is unpredictable and sometimes very serious and fatal course-must not to be taken casually.

- Detection of complications at their very early stage and management of complex situations like organ failure in acute severe pancreatitis-- requires greater degree of suspicion and ***fully equipped armamentarium of diagnostic modalities*** and ***intensive care unit.***

- Management of pancreatitis requires involvement of physician, intensivist, nutritionist, physiotherapist, radiologist, pathologist and surgical gastroenterologist- ***multidisciplinary team***

THANK YOU !