Seminari Scuola di Specializzazione in Emergenza Urgenza

Università degli Studi di Ferrara

Nuovo Arcispedale S. Anna, Cona, FE - 27.02.2018

Pancreatite Acuta

…Tutto quello che avreste voluto sapere e non avete mai osato chiedere sulla pancreatite acuta…

Roberto De Giorgio

"Acute Pancreatitis is the most terrible of all the calamities that occur in connection with the abdominal viscera."

Sir Berkeley Moynihan *Ann Surg* 1925

Dati Clinici

- F, 60 anni
- Recente colectomia sx per adenoca. non infiltrante; non altre patologie in APR;
- In PS per: dolore epigastrico, intenso (VAS: 10), irradiato posteriormente in regione lombare; vomito biliare;
- In PS: accesso venoso e analgesici (paracetamolo, poi FANS+PPI)

Esame Clinico

- Addome teso e dolente; segno di Blumberg positivo
- Nulla di patologico all'obiettività toracica e cardiaca
- P.A.: 100 / 60 mmHg

Esami Richiesti

- ECG
- RX torace
- RX addome diretto
- Esami ematochimici

Referto Esami

- ECG: alterazioni della ripolarizzazione ventricolare
- RX addome: presenza di alcuni livelli idroaerei
- RX del torace: piccolo versamento pleurico dx

Esami Ematochimici

- Leucociti: 15.300 / mm^3
- PaO_2: 80 mmHg

Risultati

Indice	Unità di misura	Valore	Limiti normali di riferimento
Amilasi tot	UI/L	267	28-110
Amilasi pancreatica	UI/L	171	13-53
Lipasi	UI/L	181	13-60
AST	UI/L	109	0-37
ALT	UI/L	57	0-40
Sodio	mEq/l	143	135-146
Potassio	mEq/l	4.7	3.5-5.3
Cloro	mEq/l	105	98-110
Calcio	mg/dl	8.7	8.0-11.0
Fosforo	mg/dl	4.5	2.5-4.5
Magnesio	mg/dl	2.2	1.8-2.9
Ferro	µg/dl	59	37-145
Ferritina	ng/ml	890	15-150

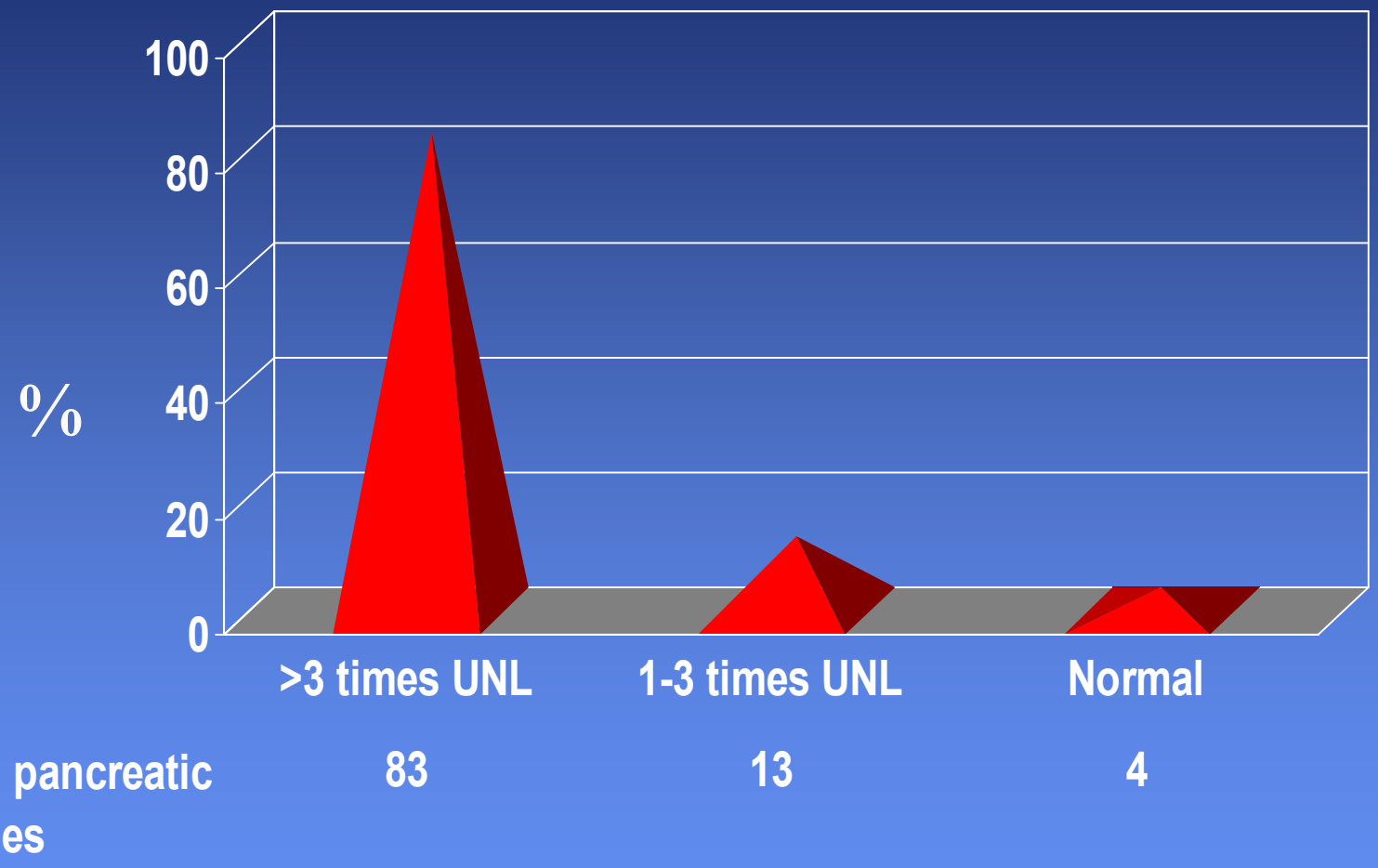
Risultati

Indice	Unità di misura	Valore	Limiti normali di riferimento
Amilasi tot	UI/L	267	28-110
Amilasi pancreatica	UI/L	171	13-53
Lipasi	UI/L	181	13-60
AST	UI/L	109	0-37
ALT	UI/L	57	0-40
Sodio	mEq/l	143	135-146
Potassio	mEq/l	4.7	3.5-5.3
Cloro	mEq/l	105	98-110
Calcio	mg/dl	8.7	8.0-11.0
Fosforo	mg/dl	4.5	2.5-4.5
Magnesio	mg/dl	2.2	1.8-2.9
Ferro	µg/dl	59	37-145
Ferritina	ng/ml	890	15-150

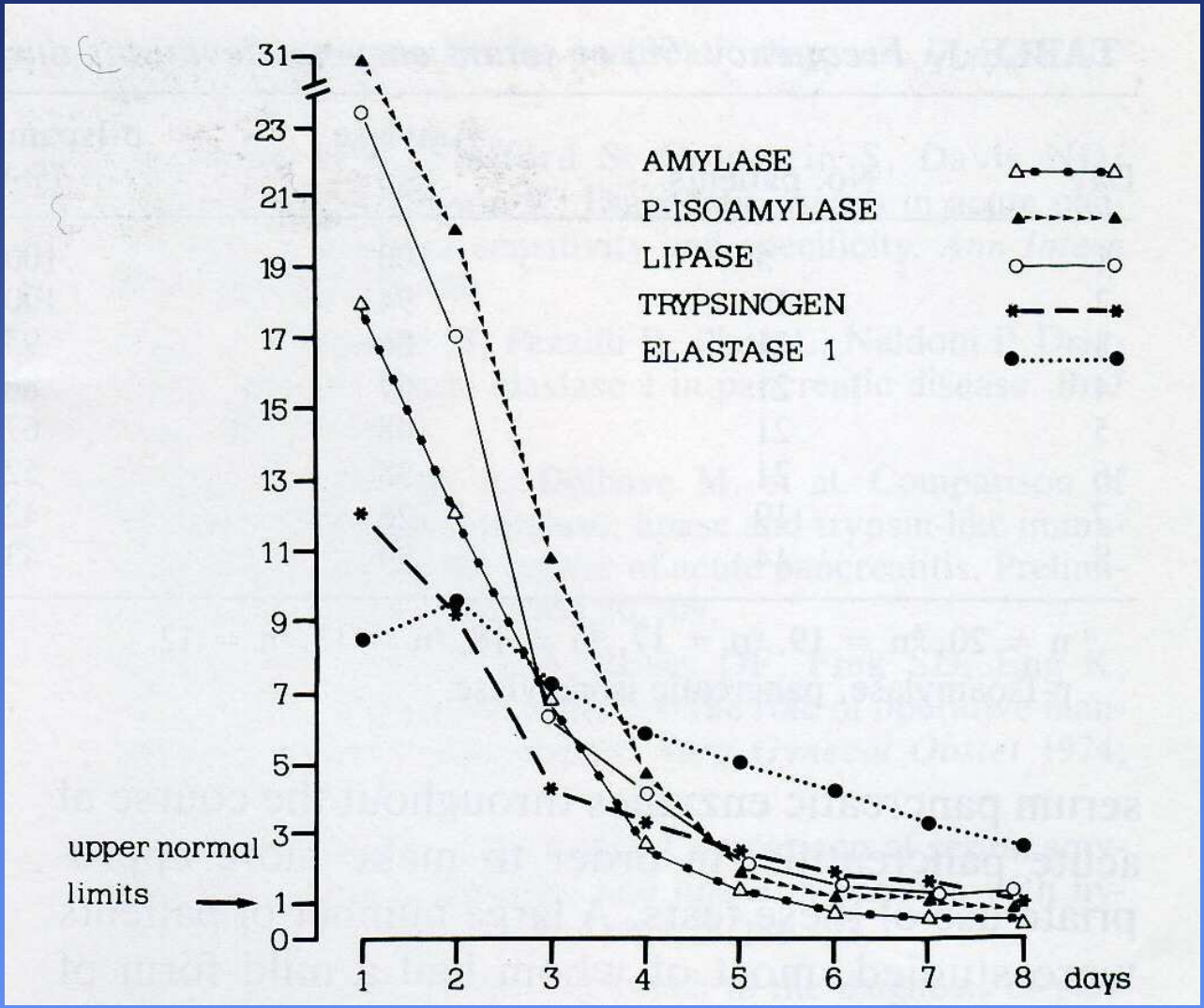
Pro-inf Aisp

Fase 1

SERUM PANCREATIC ENZYMES (Amylase and/or Lipase)



SERUM PANCREATIC ENZYMES



Ventrucci M, Pezzilli R, Naldoni P, Plate L, Baldoni F, Gullo L, Barbara L. Serum pancreatic enzyme behavior during the course of acute pancreatitis. Pancreas 1987;2(5):506-9.

Causes of elevated amylase & lipase

Amylase

- Renal insuf
- Salivary inflammation
  - i.e. parotiditis
- Macroamylasemia
  - Hereditary
- Intestinal infarction / peritonitis
  - Through transperitoneal absorption
- Cholecistitis, Salpingitis, ectopic pregnancy
- Ovarian cysts, lung inflammation
- Acidosis
- Intestinal radiation, obstruction
- Colon, ovar, panc, brst, prst, lung, esoph CA
- Pheo
- Appendicitis, gastroenteritis
- Burns, normal pregnancy

Lipase

- Renal insuff
- Small Intestinal ischemia/obstr
- Ovarian abscess
- Macrolipasemia (LNH, cirrhosis)
- Hypotension / sepsis
- HIV
- Pancreatic ca.
- Cholecystitis

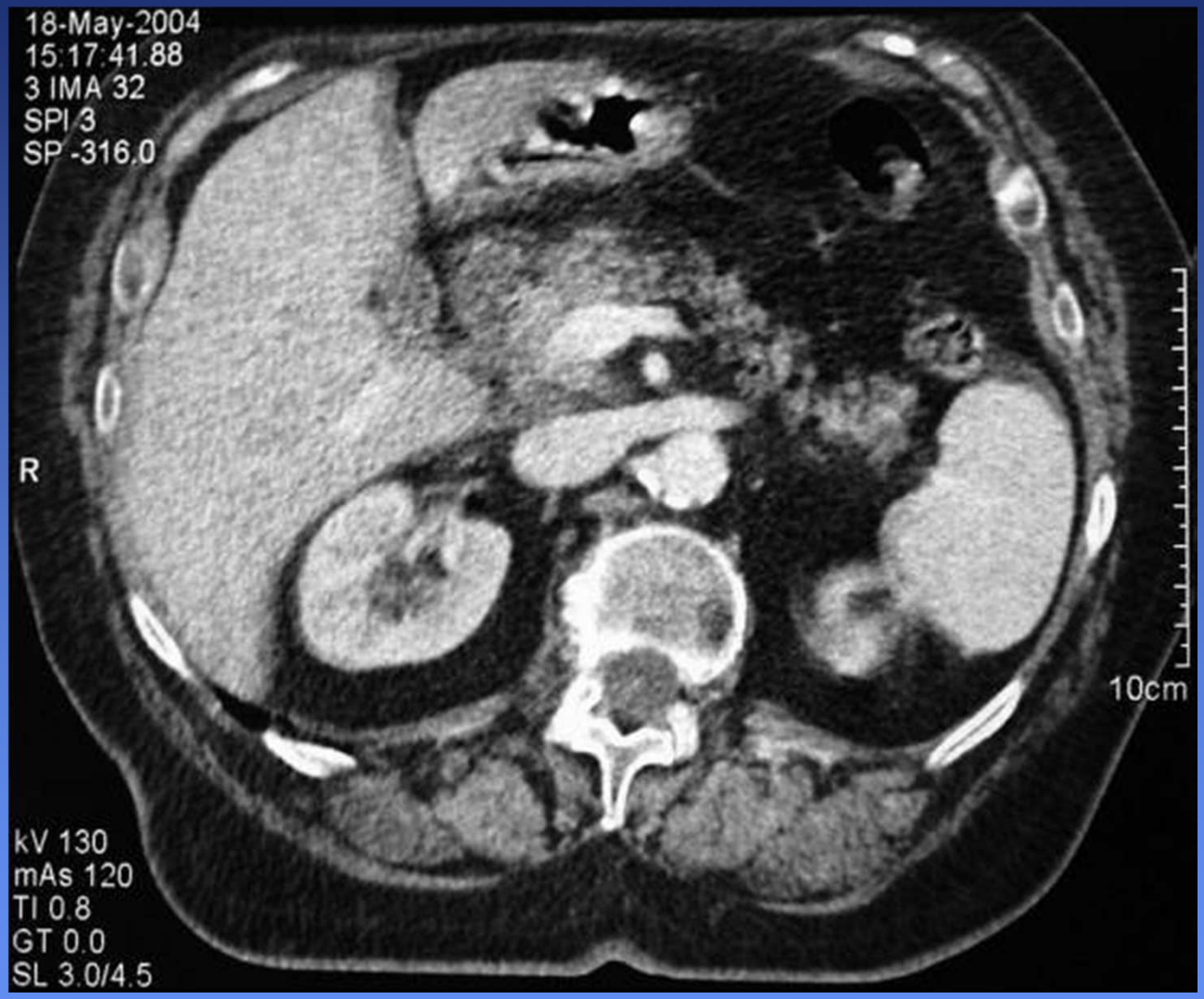
Ricordatevi della Gullo's syndrome !!!

…ma ritorniamo alla ns paziente …

Risultati-2

Indice	Unità di misura	Valore	Limiti normali di riferimento
Urea	mg/dl	99	15-50
Creatinemia	mg/dl	2.4	0.5-1.2
Acido urico	mg/dl	6.0	2.4-7.0
Glucosio	mg/dl	97	70-120
Colesterolo totale	mg/dl	139	0-200
Colesterolo HDL	mg/dl	34	45-75
Trigliceridi	mg/dl	148	20-175
Proteine totali	g/dl	6.5	6.0-8.0
Fosfatasi alcalina	UI/L	308	98-280
Bilirubina totale	mg/dl	0.93	0.16-1.1
Bilirubina diretta	mg/dl	0.65	0-0.25
GGT	UI/L	96	11-50
CHE	KU/L	4.4	4.3-12.9
LDH	UI/L	597	230-460
CPK	UI/L	312	24-195

Tomografia Computerizzata



Follow-up

- La paziente eseguì una ERCP + sfinterotomia con estrazione di calcoli dalla VBP
- In seguito fu colecistectomizzata per litiasi
- Attualmente le condizioni cliniche della paziente sono buone

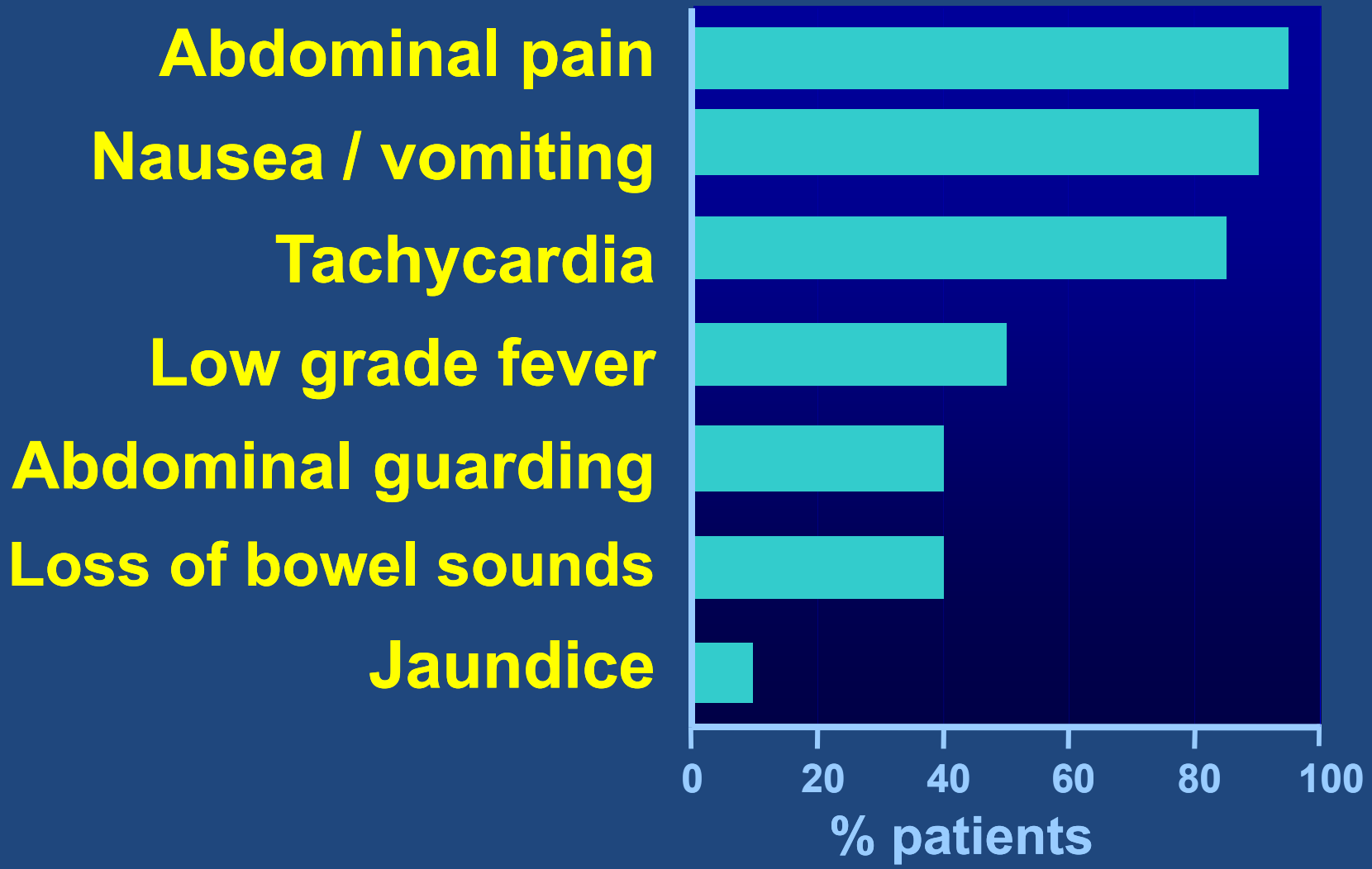
Diagosi finale: pancreatite acuta biliare

Considerazioni Pratiche

Pancreatite Acuta - Definizione

- La **pancreatite acuta** è un processo infiammatorio acuto a carico del pancreas con variabile coinvolgimento dei tessuti peripancreatici e degli organi a distanza

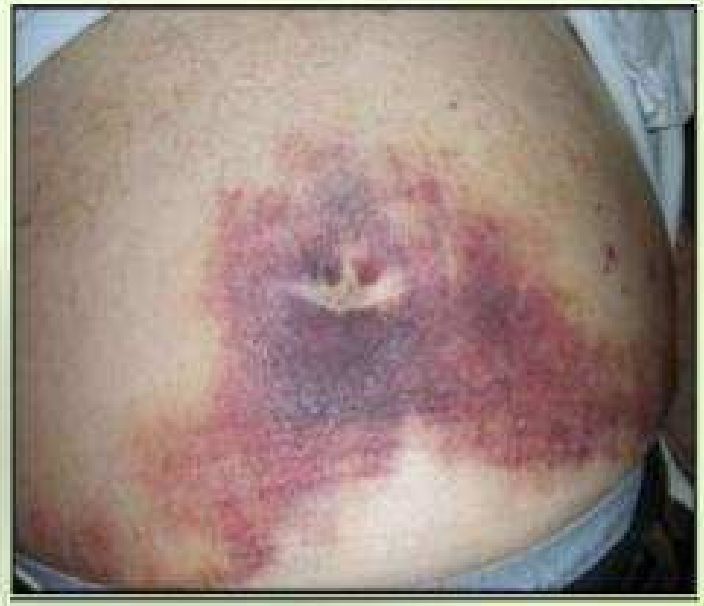
Presenting features



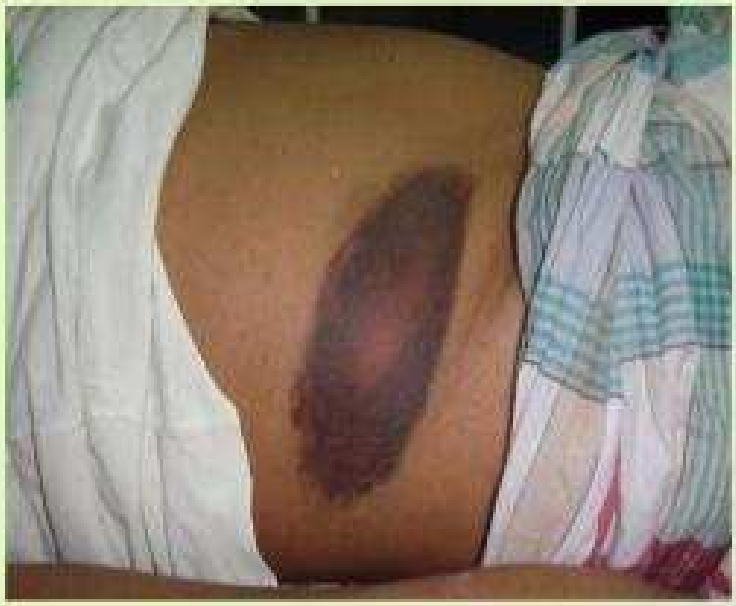
Extraintestinal manifestations

- Arthritis (lipase laden fluid with leuks)
- Serositis (pericarditis, pleuritis)
- Panniculitis, subcutaneous fat necrosis, can look like e nodosum (1% of all cases, 10% have it at autopsy)
- Intrabdominal bleeding (Cullen's sign, etc)
- Purtscher's retinopathy (rare)
  - Sudden blindness, post retinal artery occlusion

Cullen's sign



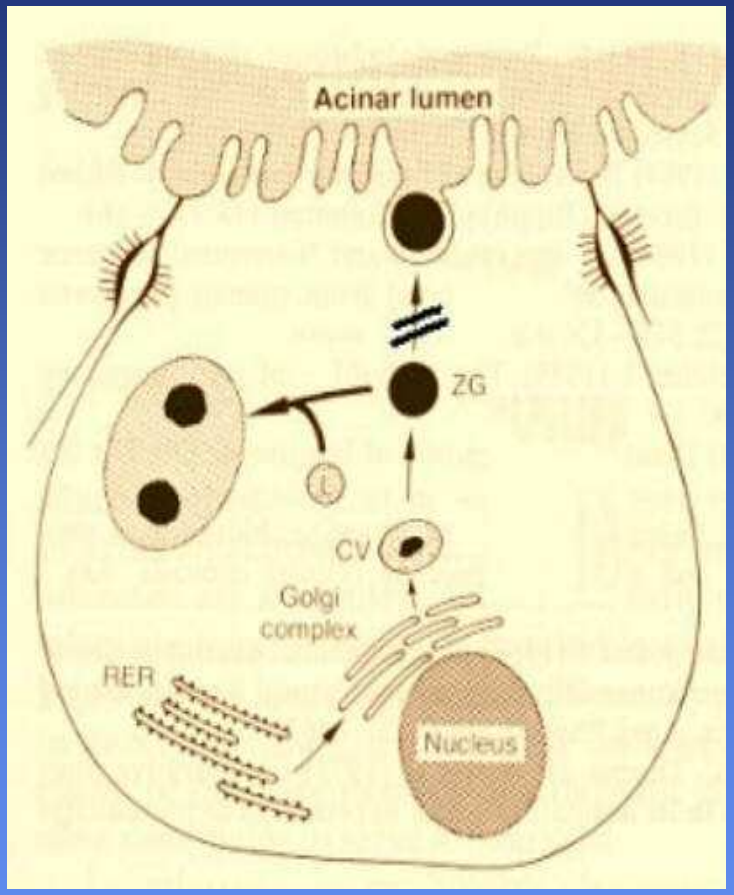
Turner's sign

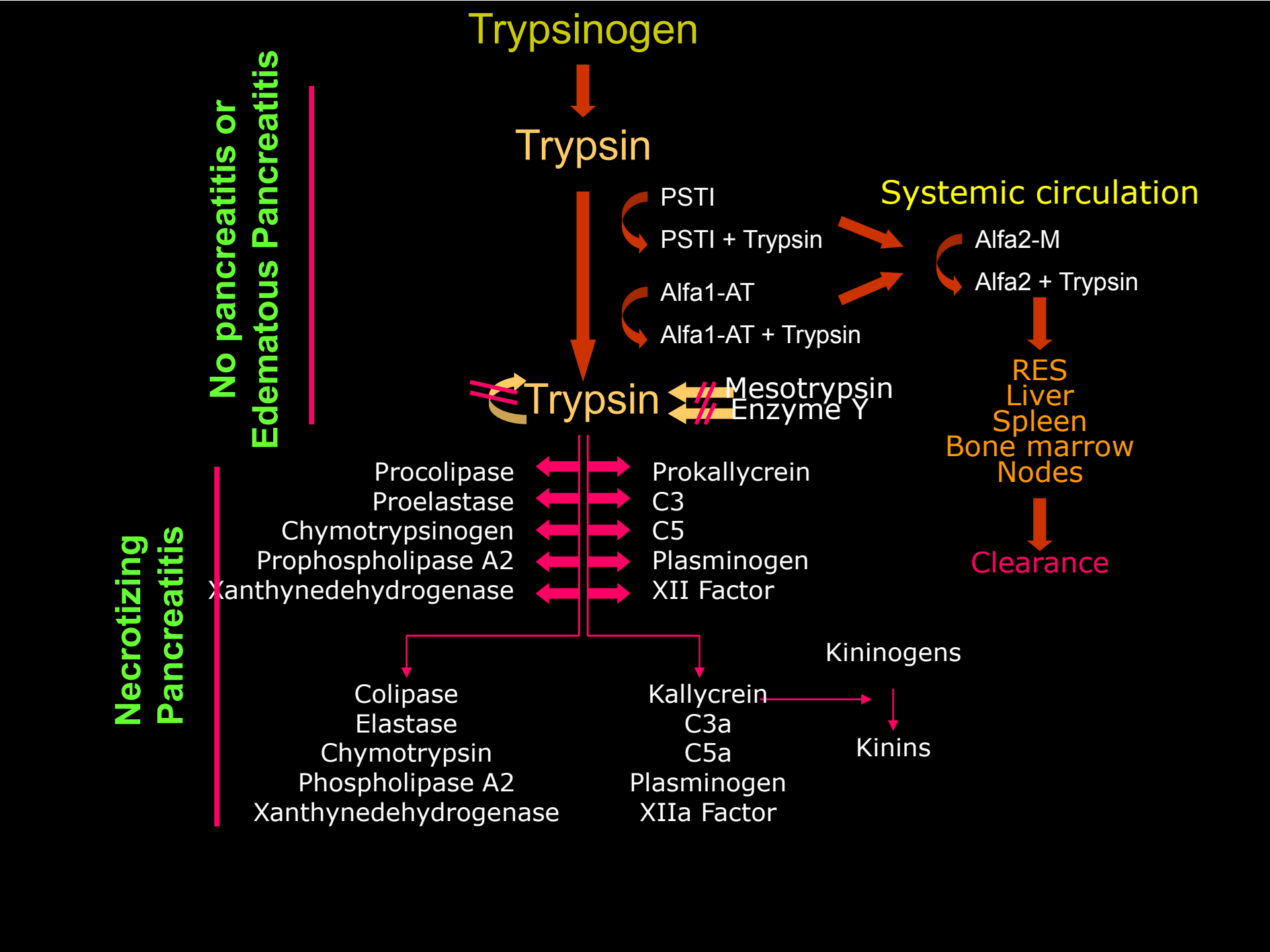


Pain in acute pancreatitis

- *"Worse than childbirth"* *"Worse than being shot"*
- Starts fast within 10-20min reaches peak
  - Third fastest pain onset in GI after perforation and Sup Mes Artery (MSA) thrombosis
- Does not usually undulate (not colicy)
- Lasts days (more, if chronic damage)
  - Longer than biliary colic which is hours
- Radiate to back in 50%
- Sometimes lacking (painless pancreatitis)
- Principal cause of admission in ER for acute pancreatitis

Pancreatite Acuta
Patogenesi

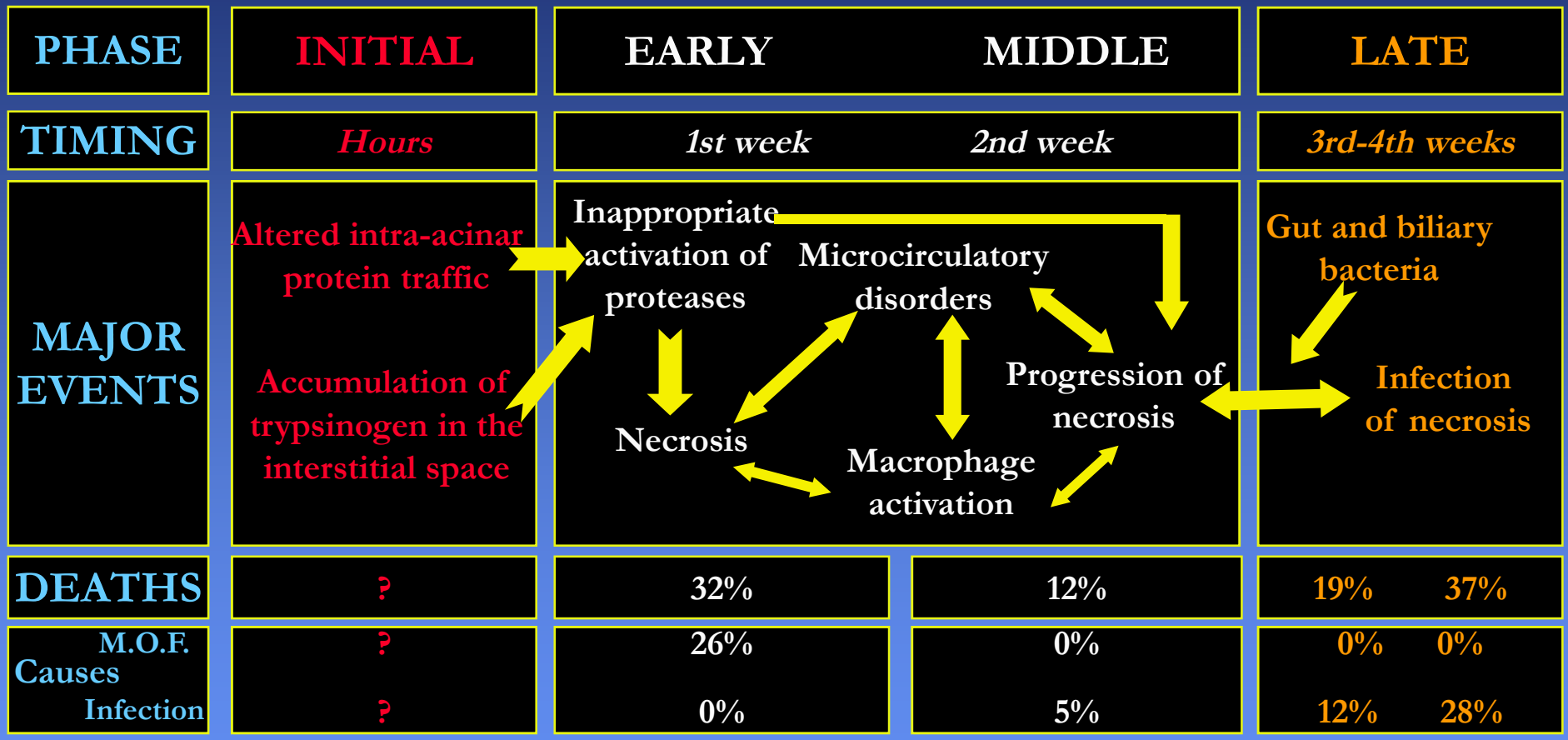



Trypsinogen
Trypsin
No pancreatitis or
Edematous Pancreatitis
PSTI
PSTI + Trypsin
Alfa1-AT
Alfa1-AT + Trypsin
Systemic circulation
Alfa2-M
Alfa2 + Trypsin
RES
Liver
Spleen
Bone marrow
Nodes
Clearance
Trypsin
Mesotrypsin
Enzyme Y
Procolipase
Proelastase
Chymotrypsinogen
Prophospholipase A2
Xanthynedehydrogenase
Prokallycrein
C3
C5
Plasminogen
XII Factor
Necrotizing
Pancreatitis
Colipase
Elastase
Chymotrypsin
Phospholipase A2
Xanthynedehydrogenase
Kallycrein
C3a
C5a
Plasminogen
XIIa Factor
Kininogens
Kinins

Bradley EL.
A clinically based classification system for acute pancreatitis. Summary of the International Symposium on Acute Pancreatitis, Atlanta, Ga, September 11 through 13, 1992.
Arch Surg 1993;128:586-90

- **La pancreatite acuta lieve, generalmente ma non necessariamente edematosa, è caratterizzata da un decorso clinico favorevole che non presenta o ha minime disfunzioni d'organo**
- **La pancreatite acuta severa è un quadro clinico che si associa ad insufficienza d'organo e/o complicanze locali quali necrosi, ascessi o pseudocisti**

Physiopathological and Clinical Phases of Acute Pancreatitis

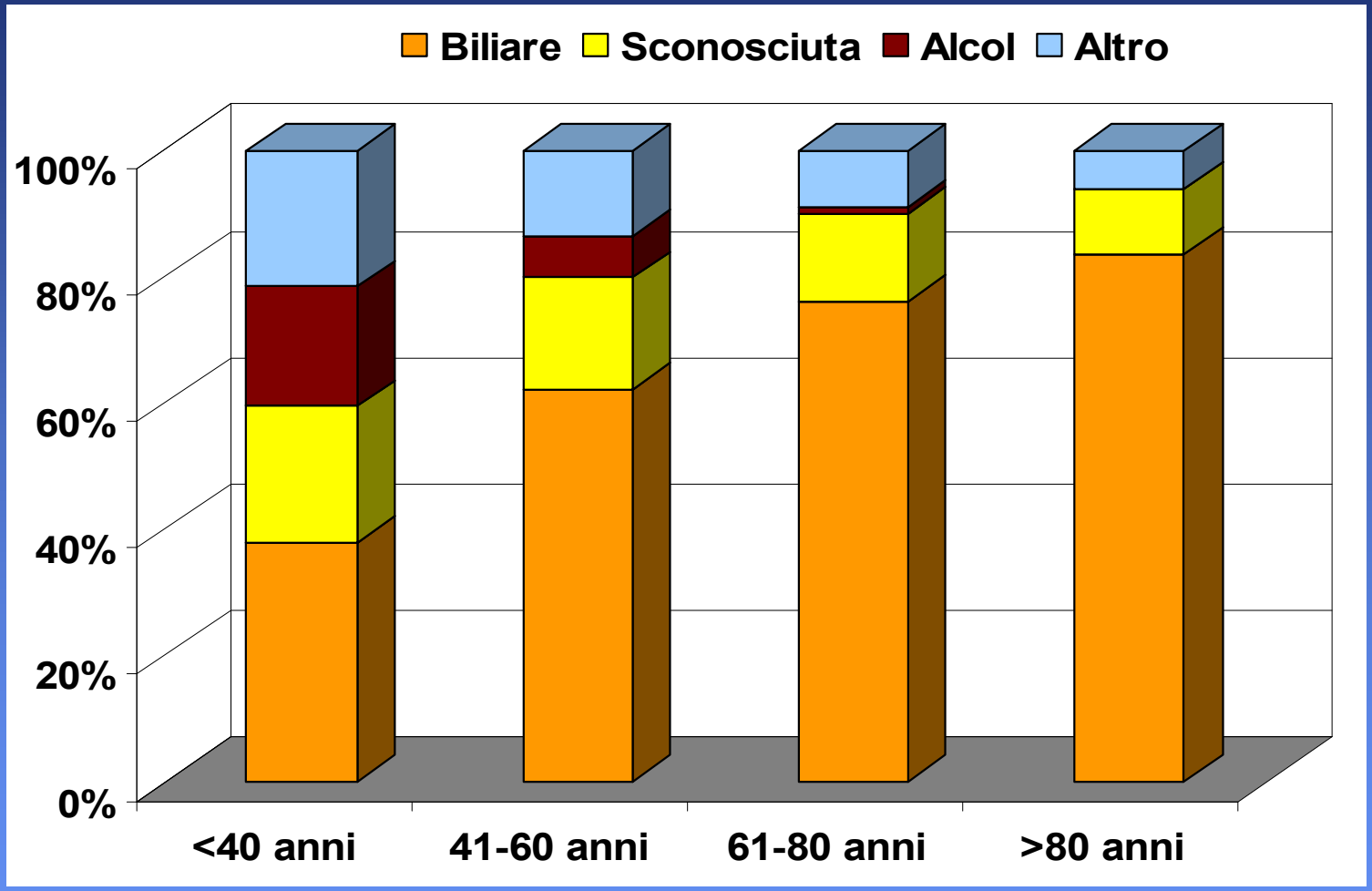


Etiologies of Acute Pancreatitis

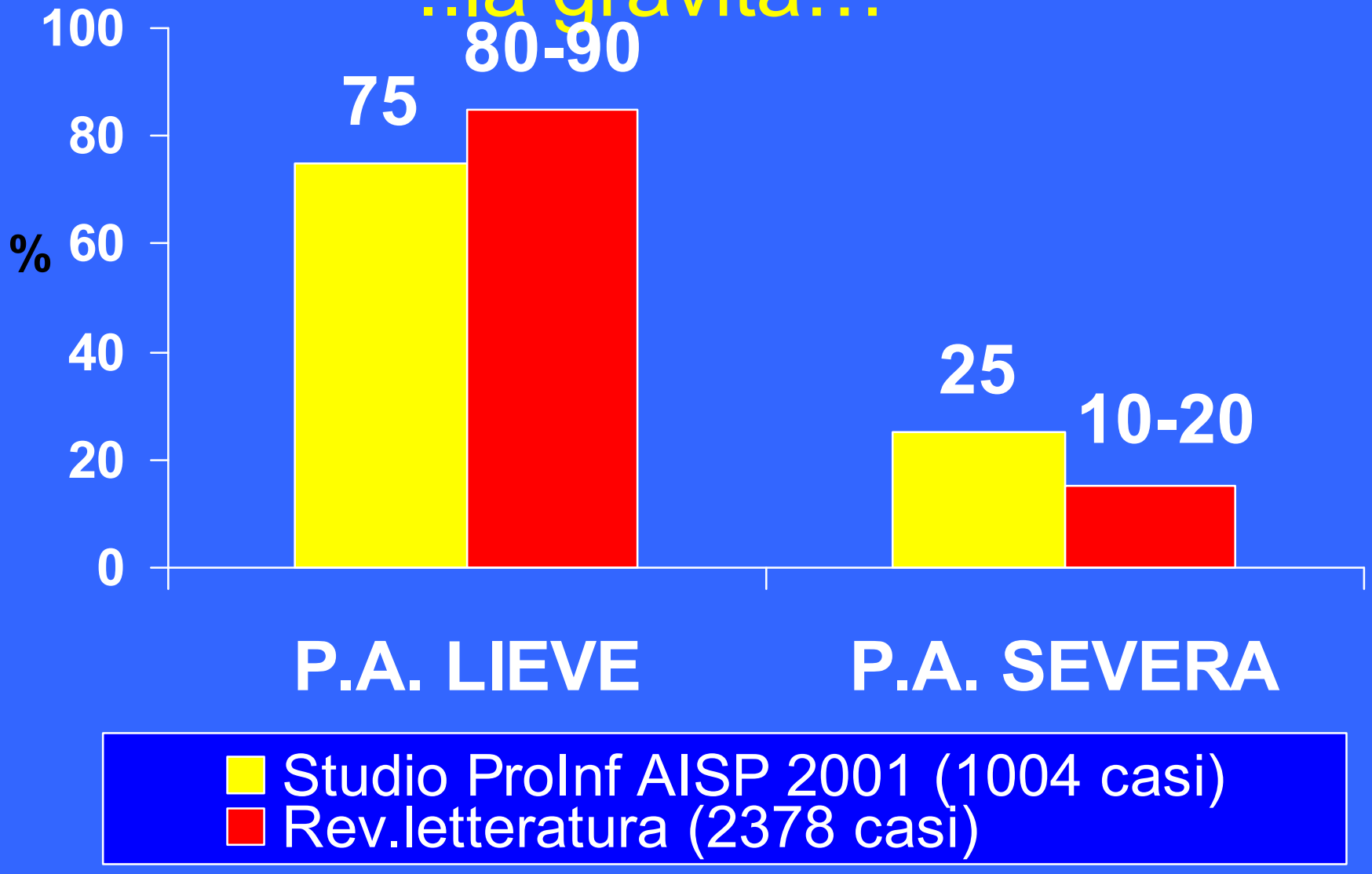
- Biliary (gallstones)***
- Alcohol****
- Triglycerides***
- pERCP,* post surgical
- Drugs**
- Tumors/obstruction
- Trauma**
- Ischemia/embolic***
- Infection (except mumps **)
- Hypercalcemia (hypPTH)
- Autoimmune/Sprue
- Hereditary
- Controversial (divisum/SOD)
- Scorpions***
- Chemical: insecticide/MeOH
- Idiopathic: 30%!!

Number of *'s denotes tendency to severity

Eziologia ed Età



..la gravità…


100
80
%
60
40
20
0
75
80-90
25
10-20
P.A. LIEVE
P.A. SEVERA
Studio ProInf AISP 2001 (1004 casi)
Rev.letteratura (2378 casi)

Necessity for severity assessment

Clinical question (CQ) 1. Is severity assessment necessary in the management of acute pancreatitis?

Severity assessment is essential to the selection of appropriate initial treatment. Even acute pancreatitis that is initially diagnosed as mild or moderate may quickly progress to severe, and continuous assessment is required, particularly during the first 3 days after onset **(Recommendation A)**

JPN guidelines for the management of acute pancreatitis: severity assessment of acute pancreatitis

Hirota e Coll
J Hepatobiliary Pancreat Surg
2006

Severity scores

CQ2. Are severity scoring systems (JPN score, Acute Physiology and Chronic Health Evaluation [APACHE] II score) useful for assessing the severity of acute pancreatitis?

Assessment by a severity scoring system is important when deciding on treatment policy and the need for transfer to a specialist unit. Use of the JPN score is recommended for severity assessment in Japan **(Recommendation A)**

Historical progress

Factor Risk Assessment
APACHE-II Score

Variabile fisiologica	Range di anormalità elevata							Range di anormalità bassa		Punti
	+4	*+3*	*+2*	*+1*	*0*	*+1*	*+2*	*+3*	*+4*	
Temperatura rettale (°C)	≥41	30-40.9		38.5-38.9	36-38.4	34-35.9	32-33.9	30-31.9	≤29.9	
Pressione arteriosa media	≥160	130-159	110-129		70-109		50-69		≤49	
Frequenza respiratoria (ventilato o non ventilato)	≥50	36-49		25-34	12-24	10-11	6-9		≤5	
Ossigenazione: A-aDO_2 o PaO_2 (mmHg) a. FiO2 ≥0.5 A-aDO_2 registrata	≥500	350-499	200-349		<200					
b. FiO2 ≥0.5PaO_2 registrata					PO_2>70	PO_2 61-70		PO_2 55-60	PO_2<55-70	
PH arterioso (preferito)	≥7.7	7.6-7.69		7.5-7.59	7.33-7.49		7.25-7.32	7.15-7.24	<7.15	
HCO_3 sierico (mEq/L venoso)	≥52	41-51.9		32-40.9	22-31.9		18-21.9	15-17.9	<15	
Sodio sierico (mEq/L)	≥180	160-179	155-159	150-154	130-149		120-129	111-119	≤110	
Potassio sierico (mEq/L)	≥7	6-6.9		5.5-5.9	3.5-5.4	3-3.4	2.5-2.9		<2.5	
Creatininemia (mg/dL); doppio punteggio per insufficienza renale acuta	≥3.5	2-3.4	1.5-1.9		0.6-1.4		<0.6			
Ematocrito (%)	≥60		50-59.9	46-49.9	30-45.9		20-29.9		<20	
Leucociti (numero/mm^3)	≥40		20-39.9	15-19.9	3-14.9		1-2.9		<1	
Glasgow Coma Score (Score=15 menoscore attuale)										
A. Punteggio totale (somma dei 12 punti precedenti										
B. Età	≤44=0 45-54=2 55-64=3 65-74=5 ≥75=6									
C. Punti patologie croniche	5 punti per pazienti non operati o per pazienti operati in emergenza; 2 punti per pazienti operati in elezione									
Totale Punteggio APACHE II	(sommare i punteggi A+B+C									

Definizioni: L'insufficienza d'organo o lo stato di immunodeficienza deve essere evidente prima dell'ammissione in ospedale e conforme ai seguenti criteri: **Fegato:** biopsia compatibile con cirrosi e ipertensione portale documentata; episodi di pregressa emorragia delle alte vie digestive attribuita ad ipertensione portale; o precedenti episodi di insufficienza epatica/encefalopatia/coma. **Cardiovascolare:** Classe IV NYHA. **Respiratoria:** Malattia cronica restrittiva, ostruttiva o vascolare che determina severo degrado dell'esercizio fisico o dipendenza dal respiratore. **Renale:** dialisi. **Immunocompromissione:** Il paziente riceve terapia che sopprime la resistenza alle infezioni.

Interpretazione del punteggio

0-4 = circa 4% di mortalità	10-14 = Circa 15% di mortalità	20-24 = Circa 40% di mortalità	30-34 = Circa 75% di mortalità
5-9 = circa 8% di mortalità	15-19 = Circa 25% di mortalità	25-29 = Circa 55% di mortalità	>34 = Circa 85% di mortalità

INDICI MULTIFATTORIALI IN CORSO DI P.A.

I. Ranson all' ingresso

Età	> 55 anni
Globuli bianchi	> 16.000/mm3
Glicemia	> 200mg/100ml
LDH	> 350 U/L
AST	> 250 U/L

I. Ranson a 48 ore

Ematocrito	Riduzione > 10%
Azotemia	Incremento > 5 mg/100 ml
Ca^{2+}	< 8 mg/100 ml
PaO_2	< 60 mm Hg
Deficit basi	> 4 mEq/L
Sequestro liquidi	> 6 L

Correlazione tra I.Ranson e mortalità in corso di pancreatite acuta

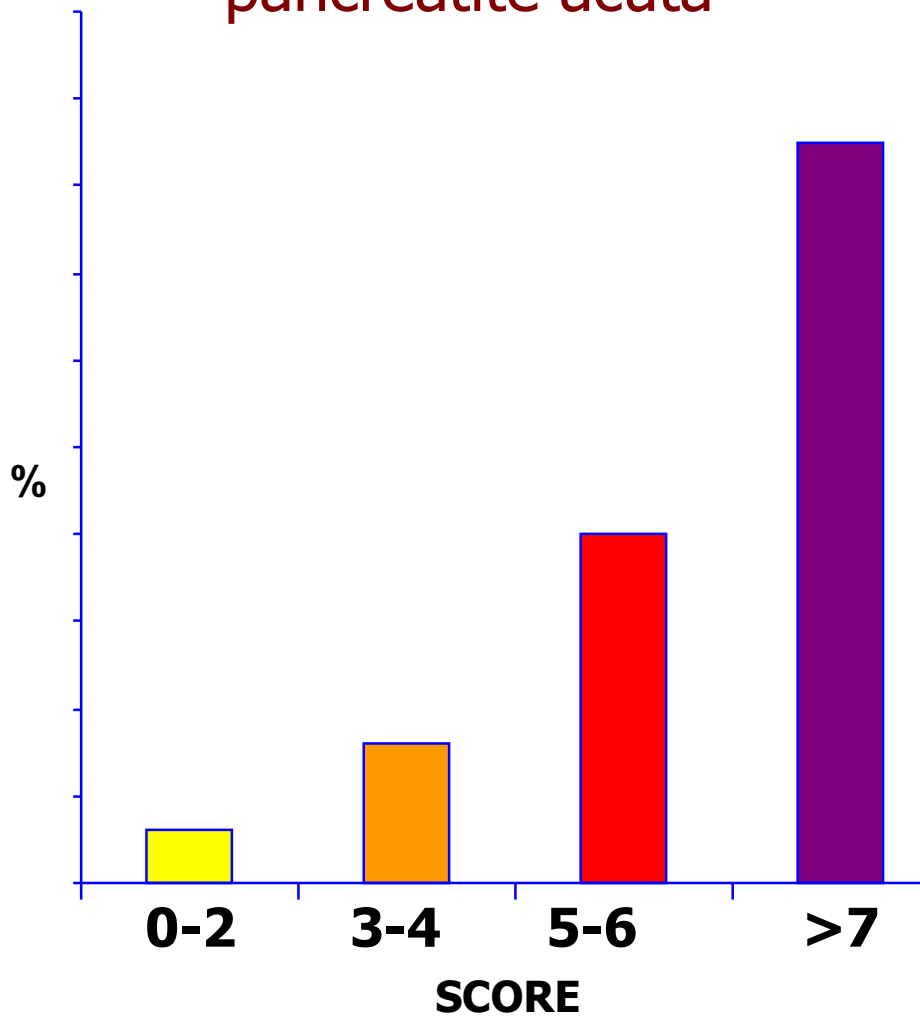


TABLE 1 CT Severity Index [9]

Prognostic Indicator	Points
Pancreatic inflammation	
Normal pancreas	0
Focal or diffuse enlargement of the pancreas	1
Intrinsic pancreatic abnormalities with inflammatory changes in peripancreatic fat	2
Single, ill-defined fluid collection or phlegmon	3
Two or more poorly defined collections or presence of gas in or adjacent to the pancreas	4
Pancreatic necrosis	
None	0
≤ 30%	2
> 30–50%	4
> 50%	6

Balthazar 1994

TABLE 2 Modified CT Severity Index

Prognostic Indicator	Points
Pancreatic inflammation	
Normal pancreas	0
Intrinsic pancreatic abnormalities with or without inflammatory changes in peripancreatic fat	2
Pancreatic or peripancreatic fluid collection or peripancreatic fat necrosis	4
Pancreatic necrosis	
None	0
≤ 30%	2
> 30%	4
Extrapancreatic complications (one or more of pleural effusion, ascites, vascular complications, parenchymal complications, or gastrointestinal tract involvement)	2

Moertele 2004

Available online at www.sciencedirect.com
ScienceDirect
Digestive and Liver Disease 40 (2008) 803–808
Digestive and Liver Disease
www.elsevier.com/locate/dld

Progress Report

Diagnosis and treatment of acute pancreatitis: The position statement of the Italian Association for the study of the pancreas

R. Pezzilli [a,*,1], G. Uomo [b,1], A. Zerbi [c,1], A. Gabbrielli [d,1], L. Frulloni [e,1], P. De Rai [f,1], G. Delle Fave [g,1], V. Di Carlo [c,1]

[a] Department of Internal Medicine and Gastroenterology, S. Orsola-Malpighi Hospital, Bologna
[b] Department of Internal Medicine, Cardarelli Hospital, Naples
[c] Department of Surgery, University Vita e Salute, IRCCS S. Raffaele, Milan
[d] Digestive Endoscopy, Campus Biomedico, Rome
[e] Department of Surgical and Gastroenterological Sciences, University of Verona, Verona
[f] Department of Emergency Surgery, Fondazione IRCCS Maggiore, Mangiagalli and Regina Elena Hospital, Milan
[g] Division of Digestive and Liver Diseases, University "La Sapienza", Rome, Italy

Received 4 February 2008; accepted 14 February 2008
Available online 2 April 2008

Table 1
Prediction of severe acute pancreatitis using different systems and laboratory tests

	Findings	Time of evaluation	Sensitivity (%)	Specificity (%)
APACHE II score[a]	>8	On admission and daily	60	85
Chest X-ray ± serum creatinine	• Chest alterations • Creatinine >2 mg/dl	On admission	60	88
Contrast-enhanced CT[b]	Balthazar criteria	After 72 h from pain onset	85	100
Interleukin-6	>2.7 pg/ml	Within 48 h from pain onset	100	80
C-reactive protein	>150 mg/l	At 48 h after pain onset	85	90

[a] Acute Physiology and Chronic Health Evaluation.
[b] CT Computed tomography.

...la mortalità in corso di pancreatite acuta...

Table 7. Mortality from acute necrotizing pancreatitis

Author (year)	Acute pancreatitis, all causes: *n*	Acute pancreatitis, all causes: Mortality (%)	Severe acute pancreatitis: *n*	Severe acute pancreatitis: Mortality (%)	Necrotizing acute pancreatitis: *n*	Necrotizing acute pancreatitis: Mortality (%)
Karimgani et al.[173] (1992)			26[a]	38		
Bradley and Allen[174] (1991)	194				38	15
Rattner et al.[175] (1992)					73	25
Allardyce[172] (1987)	348	5.2	43	33	17	80
Perez et al.[170] (2002)	1110				99	14
Gullo et al.[14] (2002)	1068	7.8			479	16
Lankisch et al.[176] (2002)	326	7.1			64	
Japan's national survey[177] (2000)	1240	7.4	409	22	117	23

[a] Patients with at least one systemic complication

5.2-7.8% **22-38%** **14-80%**

Table 6. Comparison of mortality and time of death in acute pancreatitis [National Survey Data (Japan) added to data from the review by Blum et al.]

Author	Number of cases	Overall mortality: *n*	Overall mortality: %	Proportion of early deaths (%): *n*	Proportion of early deaths (%): %	Proportion of late deaths (%): *n*	Proportion of late deaths (%): %
Mann et al.[149]	631	57	9	18	32[a]	39	68
Talamini et al.[152]	192	17	9	14	82[b]	3	18
Lowham et al.[153]	105	6	6	6	100[a]	—	—
McKay et al.[151]	NA	NA	8	NA	54[a]	—[c]	46
Mutinga et al.[154]	805	8	2	8	47[b]	9	53
Blum et al.[155]	368	17	5	7	41[a]	10	59
National Survey (Japan)[157]	1131	67[d]	6	19	28[a]	48	72
	1131	67[d]	6	27	40[b]	40	60

[a] Early mortality was defined as death within 1 week
[b] Early mortality was defined as death within 2 weeks
[c] No single piece of data given
[d] Includes only the 67 cases in which acute pancreatitis was presumed to be the cause of death among a total of 94 fatal cases

Sekimoto 2006

…diagnosi di pancreatite acuta biliare…

Table 3
Assessment of biliary acute pancreatitis using different radiological and laboratory tests

	Sensitivity (%)	Specificity (%)	Accuracy (%)
Ultrasonography (US)	71.8	98	86.4
Computed tomography	52.9	100	79.5
Biochemical parameters (alkaline phosphatase, AST, ALT)	84.6	69.4	76.1
US + Biochemical	94.9	100	97.7
Endoscopic ultrasonography	87.0	100	93.3
MR cholangiography	82.6	97.5	94.2

Pancreatite acuta biliare *severa*

ERCP + ES
entro 48/72 ore

SEMPRE
(Neoptolemos, Fan)

ITTERO
COLANGITE ACUTA
VB DILATATA (Folsch)

TERAPIA MEDICA INTENSIVA

In severe gallstone-associated acute pancreatitis, cholecystectomy should be delayed until there is sufficient resolution of the inflammatory response and clinical recovery
Recommendation grade B

No early surgery (entro 48 ore)
Si delayed surgery (dopo 48 ore)

Pancreatite acuta severa

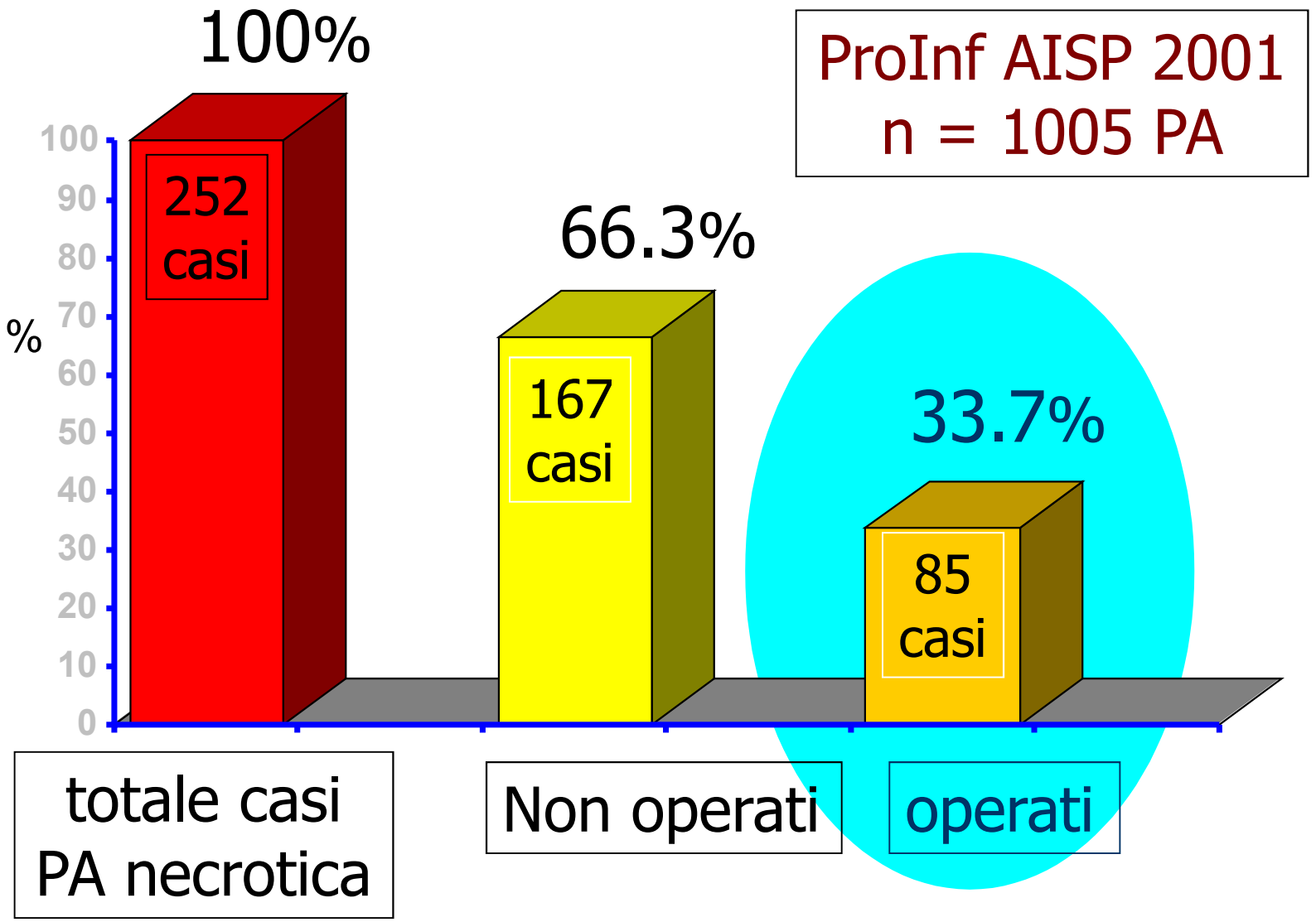
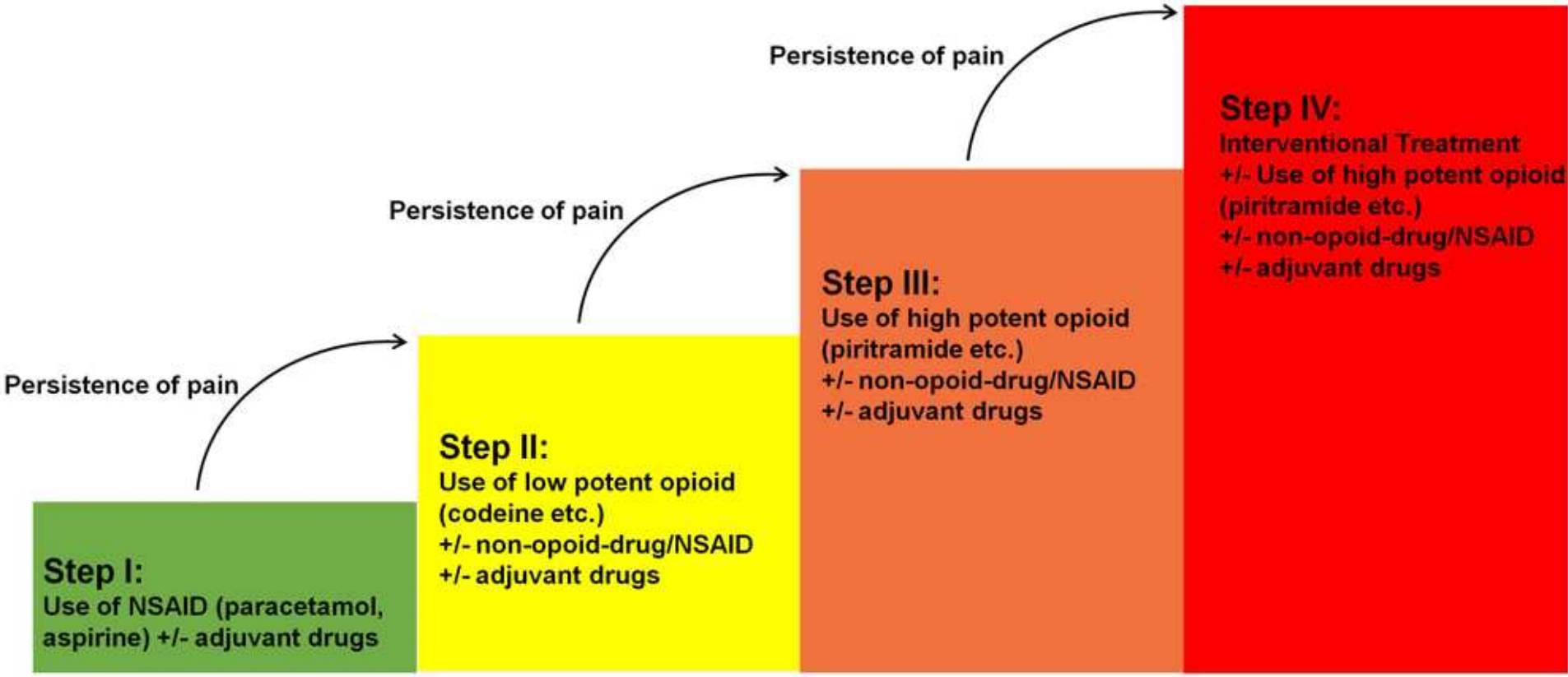


Table 5
Suggested pharmacological dosages and diet formula in severe acute pancreatitis

Drug	Dosage
Gabexate mesilate	900 mg per day
Imipenem	1500 mg per day
Standard enteral formula	12 g nitrogen and 7.11 non-protein mega joule (MJ) in 2000 ml per 24 h once established; of the non-protein energy 36% should be lipid based. The enteral feed need to be introduced at 30 ml/h and the rate should be increased, depending on tolerance, at up to 100 ml/h
Standard parenteral formula	Standard parenteral formula should have a volume of 2500 ml providing 9.4 g nitrogen and 7.52 non-protein MJ per 24 h and lipid must contribute 55% of the non-protein calories
Refeeding	Low-fat solid diet after pain disappearance

+ Pain control with petidine / tramadol !!!

Step-up increase of Rx strategy



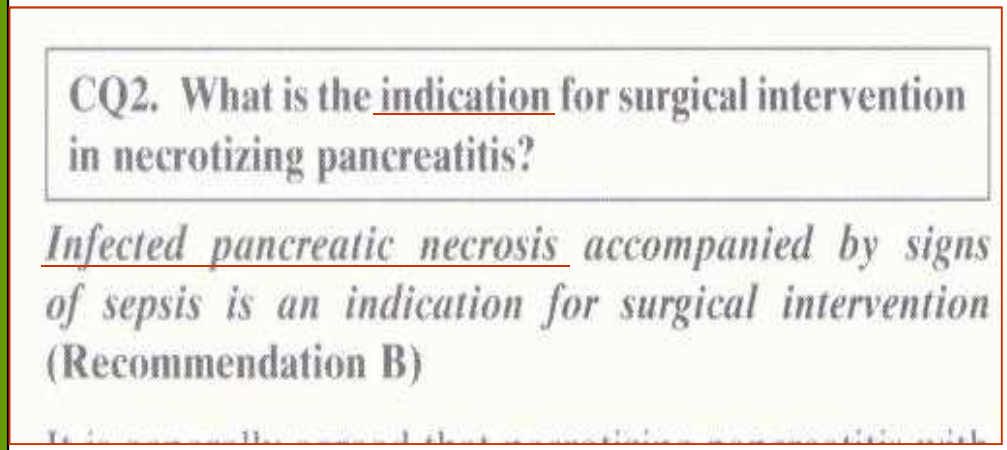
Pancreatite acuta severa

ProInf AISP 2001

…indicazioni
all'intervento chirurgico…

Necrosi infetta	57.8%
Peritonite	44.6%
Necrosi sterile	20.5%
MOF	19.3%
Pseudocisti	8.4%

JPN guidelines



CQ2. What is the indication for surgical intervention in necrotizing pancreatitis?

Infected pancreatic necrosis accompanied by signs of sepsis is an indication for surgical intervention (Recommendation B)

Tadahiro 2006

Pancreatite acuta severa

Quale chirurgia ?

Surgical procedures

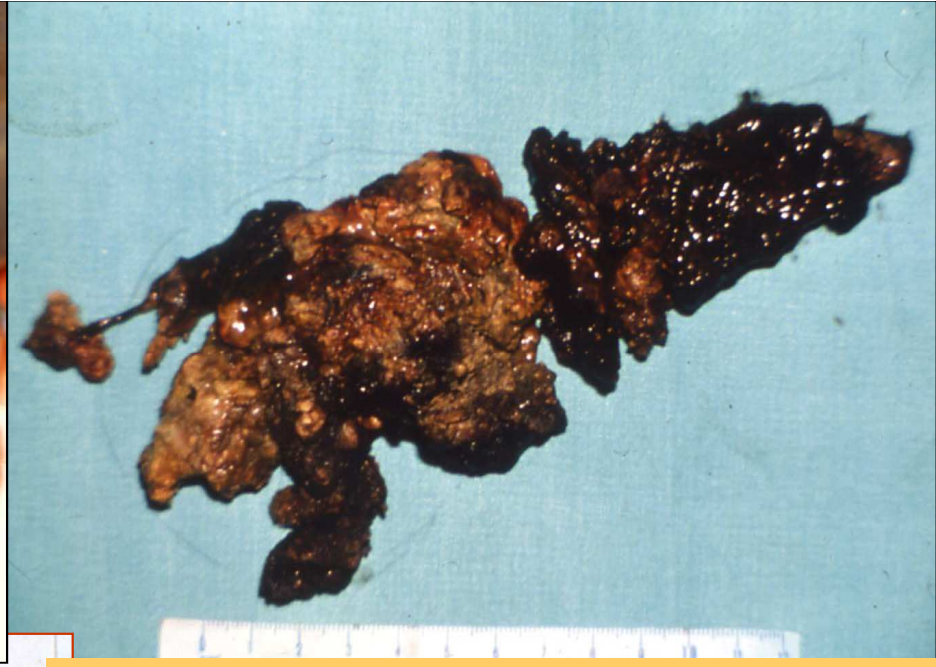
CQ5. What is the optimal surgical procedure for infected pancreatic necrosis?

***Necrosectomy** is recommended as the optimal surgical procedure for infected pancreatic necrosis* **(Recommendation A)**

CQ6. What is the optimal drainage procedure after necrosectomy?

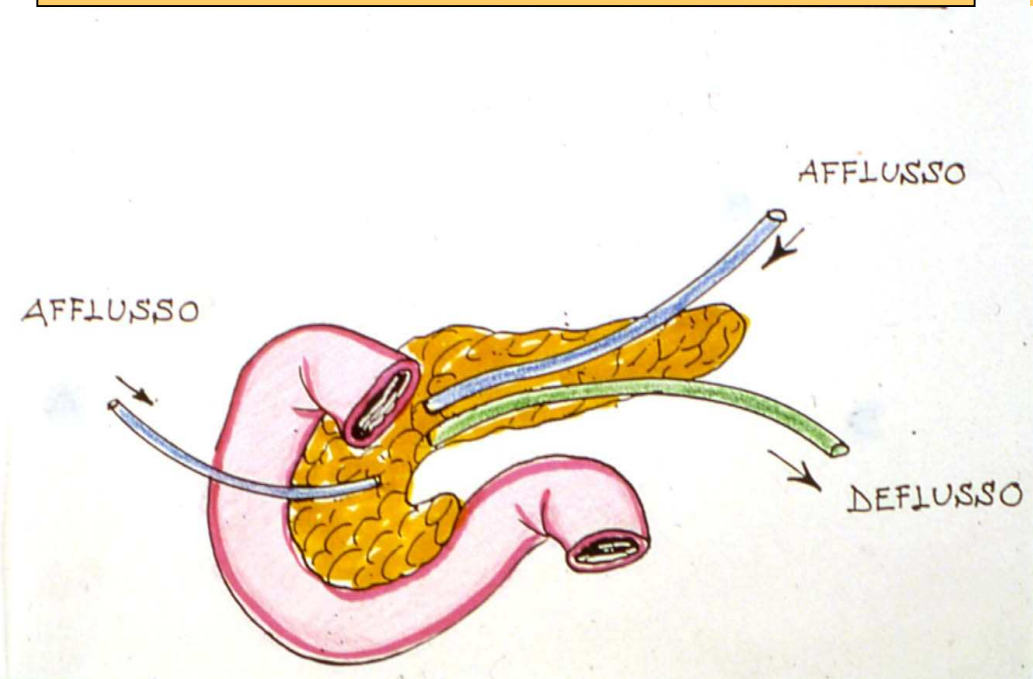
Simple drainage **(Recommendation D)** ***should be avoided** as the drainage procedure after necrosectomy, and either continuous closed lavage or open drainage (planned necrosectomy)* **(Recommendation B)** *should be performed instead. The choice between these two procedures can be made at the time based on the surgical findings and/or surgeon's experience*

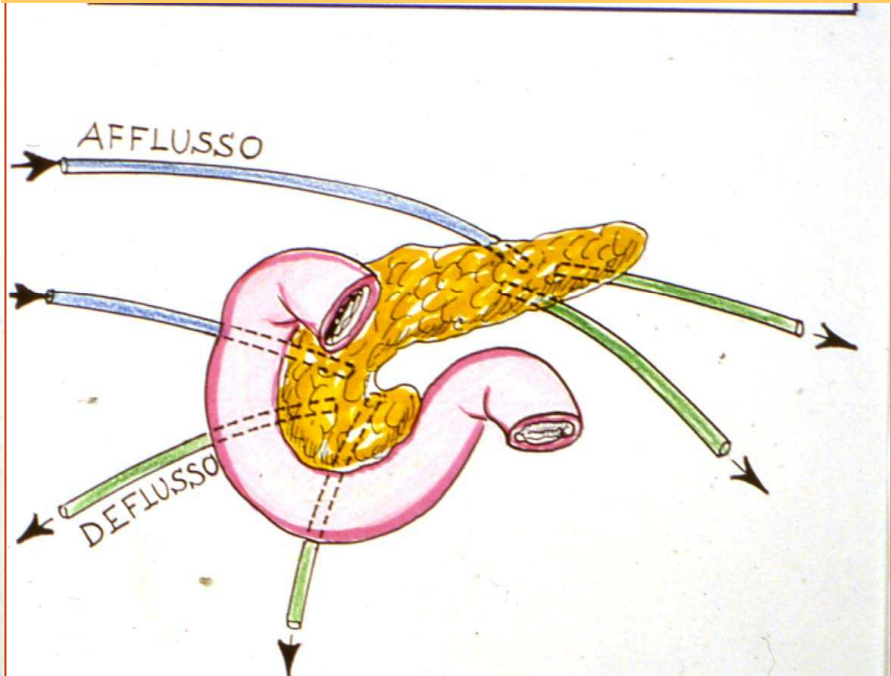
JPN guidelines 2006



Lavaggio faccia anteriore

Lavaggio faccia posteriore





Practice points

- Acute pancreatitis in Italy is a disease of increasing annual incidence.
- The diagnosis of the disease should be established within 48 h of admission.
- Early identification of patients at risk of developing a severe attack of acute pancreatitis is of great importance because rapid therapeutic interventions improve outcome.
- The endoscopic approach seems to be most beneficial measure in patients with acute pancreatitis with jaundice and in those with cholangitis.
- The development of infected necrosis should be assessed using fine-needle aspiration and the sample should be cultured for germ isolation and characterization.

Research agenda

- The role of early ERCP in all patients with severe acute pancreatitis of biliary origin is still controversial.
- The data supporting the efficacy of antibiotic prophylaxis to prevent infection of necrosis are conflicting.
- The refeeding is a crucial topic in patients who have recovered from an acute episode of mild acute pancreatitis, but there are very few studies on this issue.

trattamento delle complicanze

Pancreatic abscess

CQ7. How should pancreatic abscess be managed?
CQ8. What is the indication for surgical drainage in pancreatic abscess?

***Surgical or percutaneous drainage should be performed for pancreatic abscess (Recommendation B). If the clinical findings of pancreatic abscess are not improved by percutaneous drainage, surgical drainage should be performed immediately* (Recommendation A)**

JPN guidelines
2006

Pancreatic pseudocysts

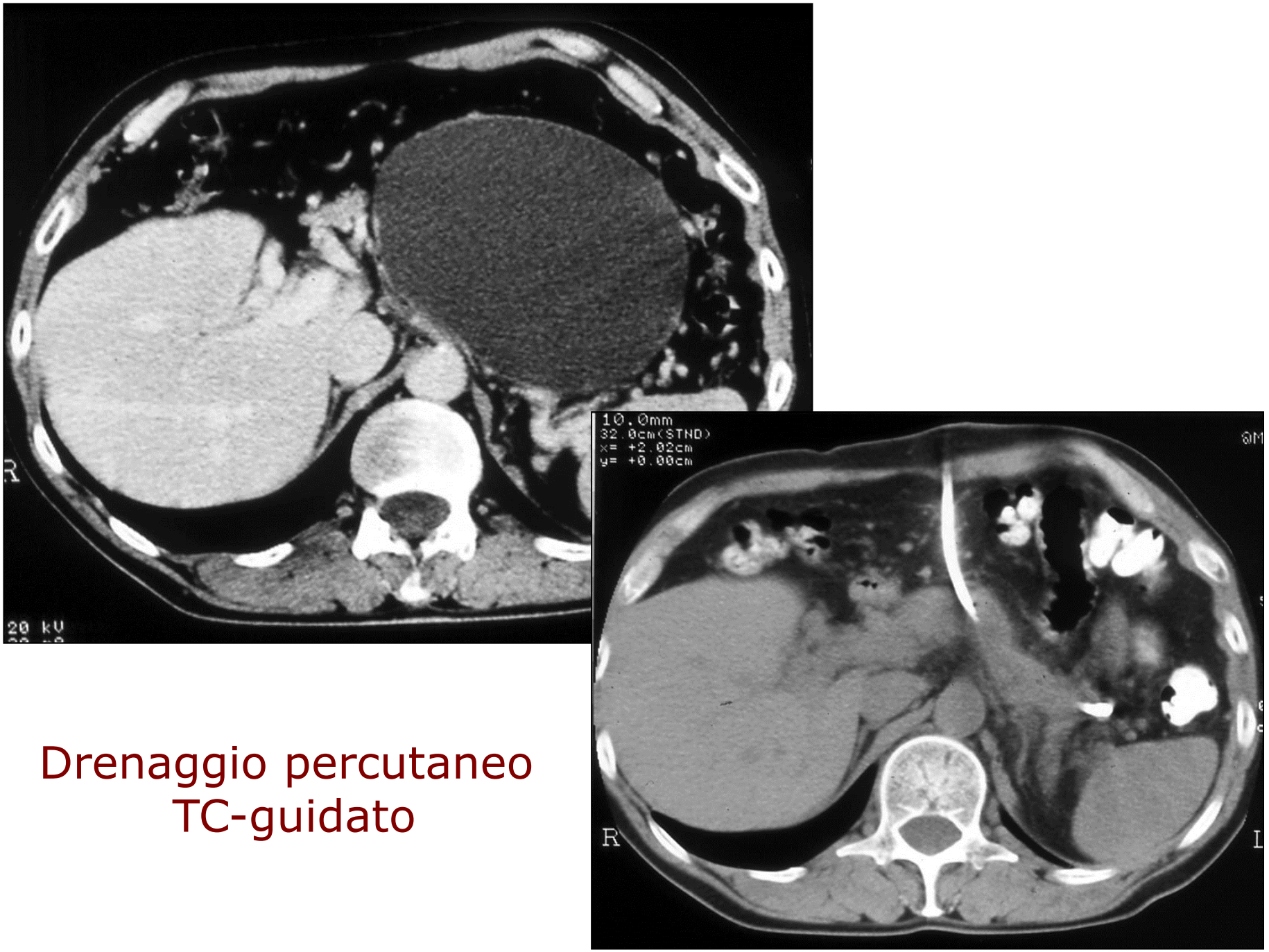
CQ9. What are the indications for drainage treatment in pancreatic pseudocysts?

Pancreatic pseudocysts that give rise to symptoms and complications or the diameter of which increases should be treated by drainage **(Recommendation A)**

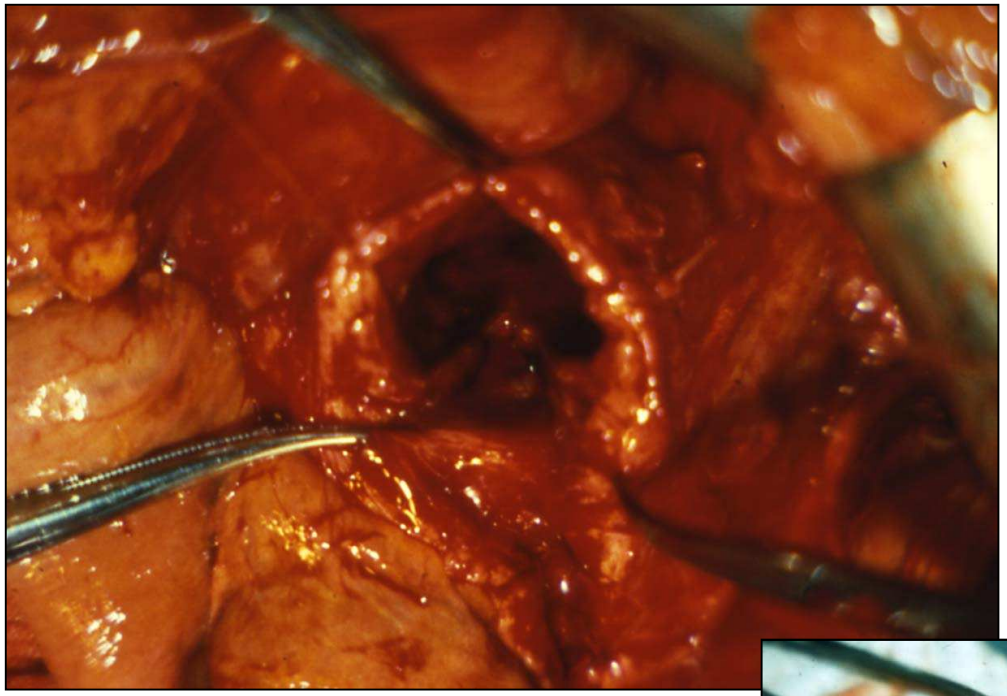
CQ10. What is the indication for surgical intervention in pancreatic pseudocysts?

Pancreatic pseudocysts that do not tend to improve in response to percutaneous drainage or endoscopic drainage should be managed surgically **(Recommendation A)**

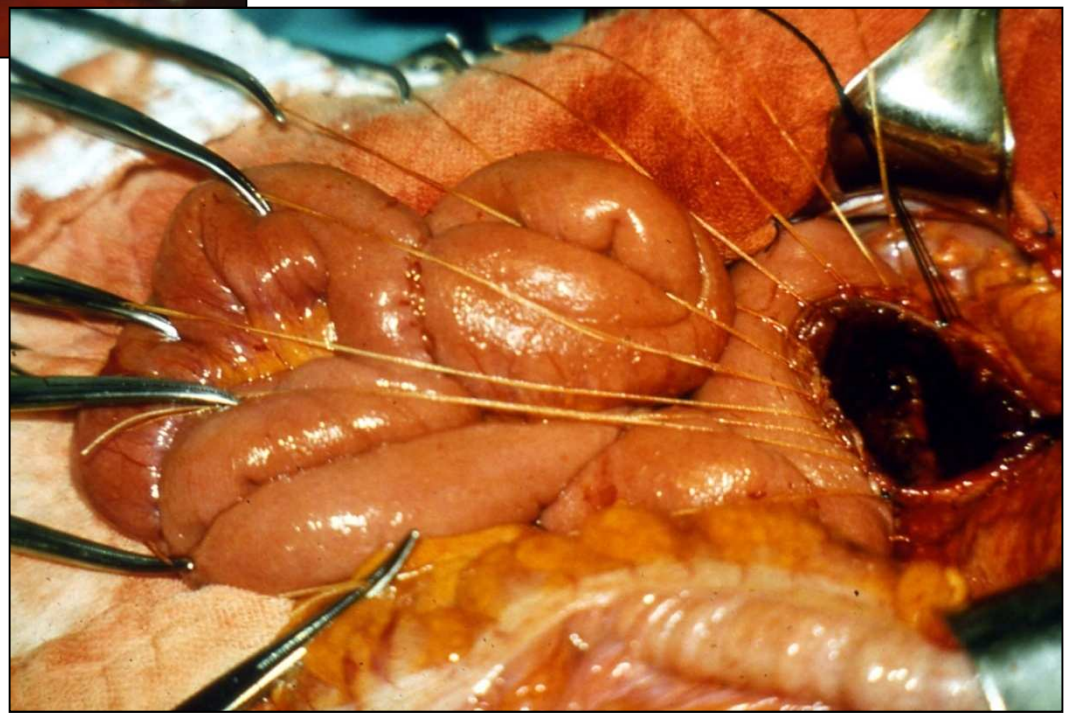
JPN guidelines
2006



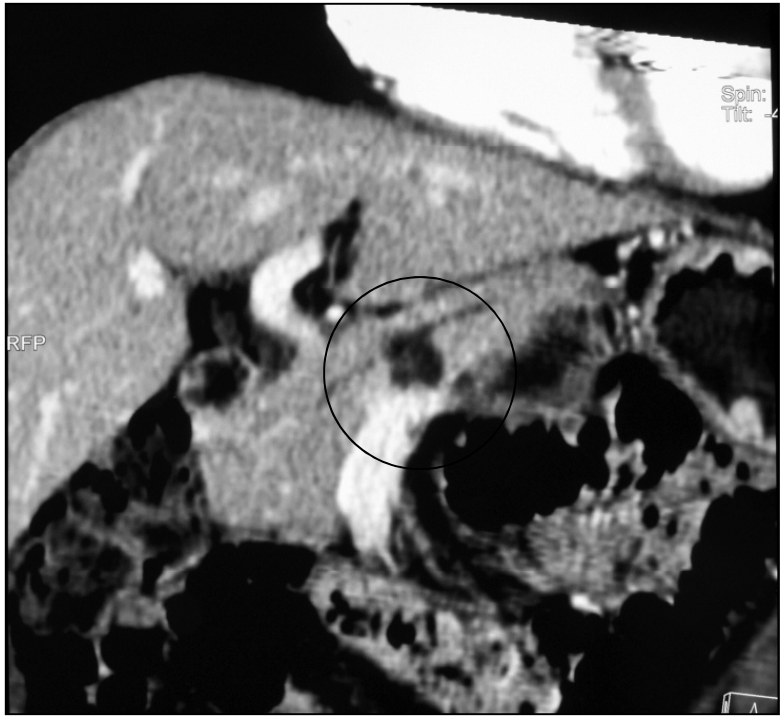
Drenaggio percutaneo TC-guidato



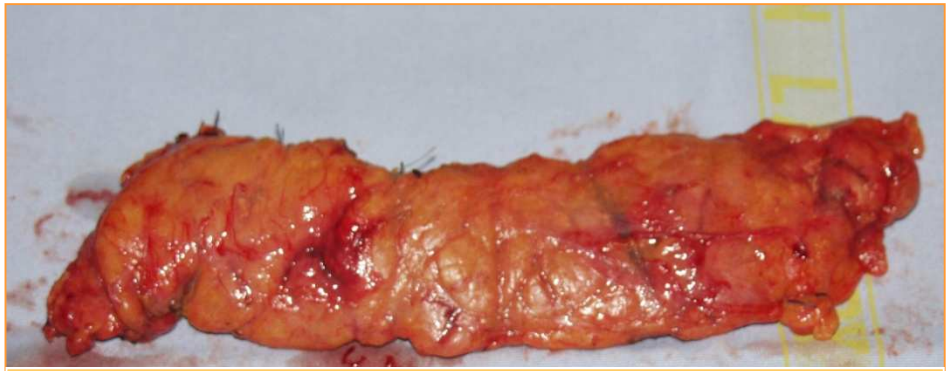
Derivazione pancreatico-digiunale



..la pancreatite acuta lieve può essere una manifestazione di un IPMN…



M., 67 aa
Precedenti episodi di PA



Pancreasectomia sinistra spleen preserving

Ultrasonography, Computed Tomography, and Biochemical Tests in Predicting Biliary Acute Pancreatitis

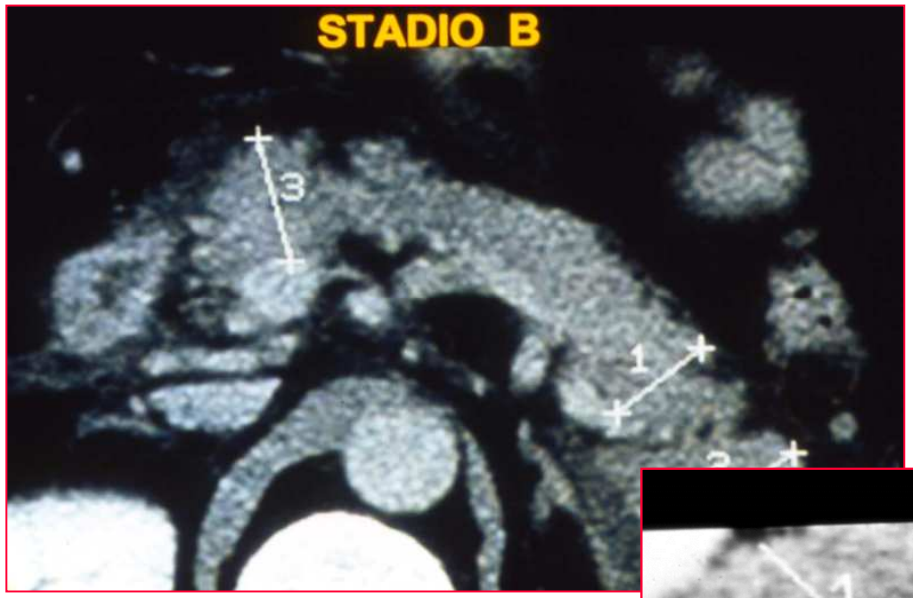
	Sensitivity (%)	Specificity (%)	Accuracy (%)
US	71.8	98	86.4
CT	52.9	100	79.5
Biochemical (AP, GGT, AST, ALT)	84.6	69.4	76.1
US + Biochemical	94.9	100	97.7

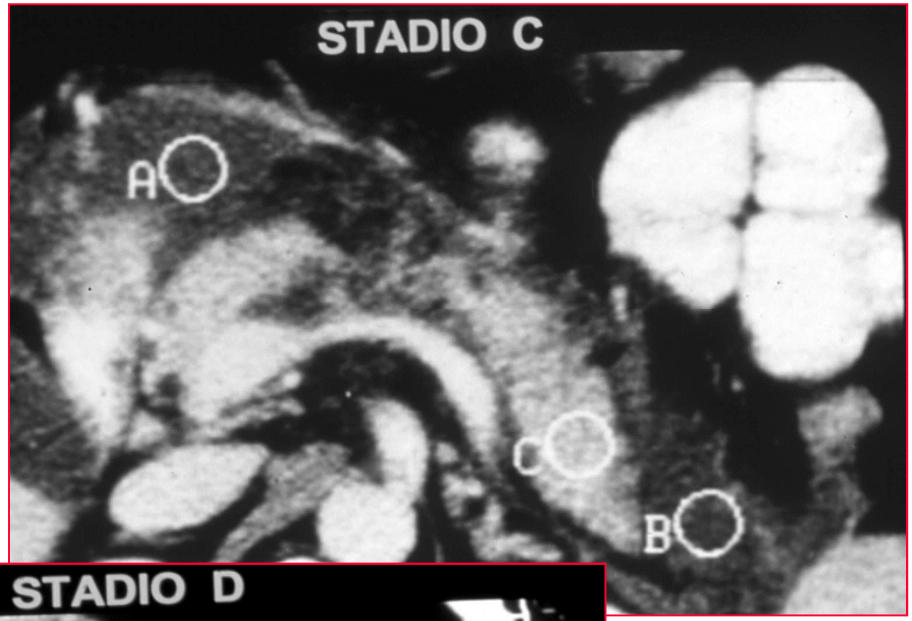
Factor Risk Assessment
Chest Radiograph and/or Serum Creatinine>2 mg/dL

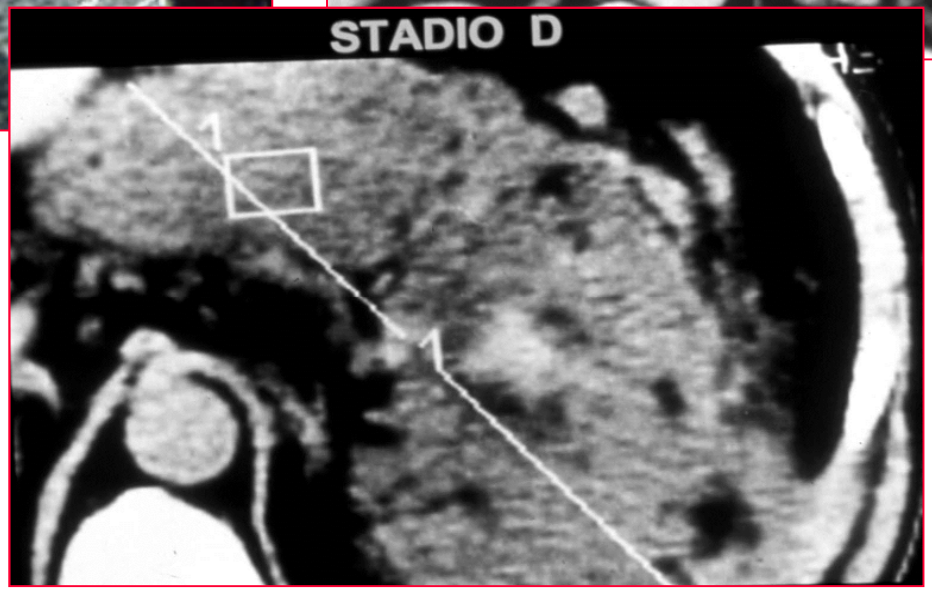
	Sensitivity	Specificity
➢Mortality	90%	76%
➢Pancreatic necrosis	60%	88%
➢Infection of necrosis	83%	75%

Talamini G, Uomo G, Pezzilli R et al, Am J Surg ,1999

Ecografia addome:
Calcolosi colecisti,
VBP, VBI modicamente dilatate







Dopo 48-72 ore

pancreatite acuta

..eziologia…

Table 3. Etiology of acute pancreatitis by country

Author (year)	Country	Alcohol (%)	Cholelithiasis (%)	Others (%)
Gullo et al.[14] (2002)	Hungary	60.7	24.0	15.3
	France	38.5	24.6	36.9
	Germany	37.9	34.9	27.2
	Greece	6.0	71.4	22.6
	Italy	13.2	60.3	26.5
Cavallini et al.[15] (2004)	Italy	8.5	60	31.5
Andersson et al.[4] (2004)	Sweden	30	35	35
Gislason[6] (2004)	Norway	17	47	36
Kim[16] (2003)	Korea	32.5	26.6	40.9
Suazo-Barahona et al.[17] (1998)	Mexico	34	43	23
National survey (1998)	Japan	30	24	46

Sekimoto e Coll. 2006

Acute Pancreatitis: Epidem

- 5-35/100,000
- Increasing incidence (detection?meds?iatrog?)
- Increases with increasing age
- Onset before 14-15 yrs unusual
  - unless hereditary, traumatic, anatomic anomaly
- 250,000 admissions per year in U.S. (2nd GI)
- $2 billion in direct costs per year
- 6th costliest GI disease behind ESLD, cancers, IBD
- NIDDK funding is 11 out of 17 GI illnesses

Available online at www.sciencedirect.com
ScienceDirect
Digestive and Liver Disease
Digestive and Liver Disease 40 (2008) 803–808
www.elsevier.com/locate/dld

Progress Report

Diagnosis and treatment of acute pancreatitis: The position statement of the Italian Association for the study of the pancreas

R. Pezzilli[a,*,1], G. Uomo[b,1], A. Zerbi[c,1], A. Gabbrielli[d,1], L. Frulloni[e,1], P. De Rai[f,1], G. Delle Fave[g,1], V. Di Carlo[c,1]

[a] Department of Internal Medicine and Gastroenterology, S. Orsola-Malpighi Hospital, Bologna
[b] Department of Internal Medicine, Cardarelli Hospital, Naples
[c] Department of Surgery, University Vita e Salute, IRCCS S. Raffaele, Milan
[d] Digestive Endoscopy, Campus Biomedico, Rome
[e] Department of Surgical and Gastroenterological Sciences, University of Verona, Verona
[f] Department of Emergency Surgery, Fondazione IRCCS Maggiore, Mangiagalli and Regina Elena Hospital, Milan
[g] Division of Digestive and Liver Diseases, University "La Sapienza", Rome, Italy

Received 4 February 2008; accepted 14 February 2008
Available online 2 April 2008

Table 2
Clinical conditions and their frequencies associated with acute pancreatitis

Clinical conditions	(%)
Biliary diseases	69.3
Alcohol	6.6
Post-ERCP	3.0
Surgery	1.4
Hyperlipemia	1.1
Drugs	0.9
Trauma	0.4
Pancreatic malformations	0.3
No presence of clear factors	17.1

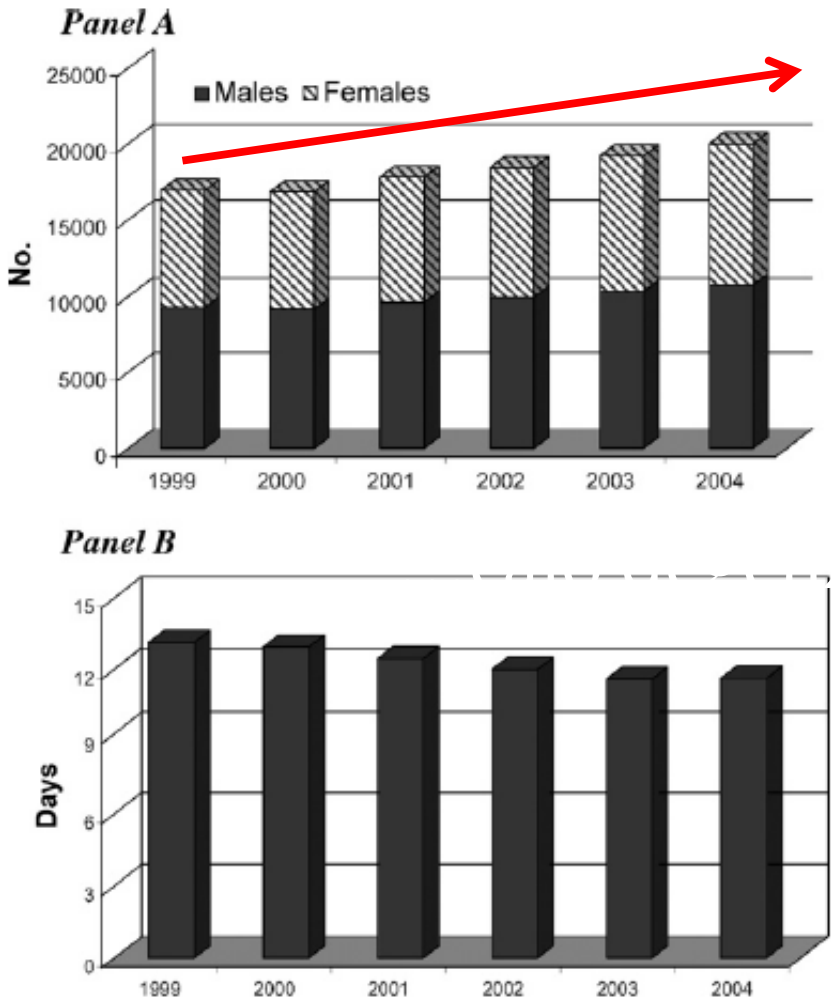


Fig. 1. (Panel A) Number of hospitalization for acute pancreatitis in Italy in the period of 1999–2004. (Panel B) Hospital stay for acute pancreatitis in Italy in the period of 1999–2004.

APACHE III SCORING SYSTEM

Temperatura

Pressione arteriosa media

Frequenza cardiaca

Frequenza respiratoria

PaO2

pH arterioso

Sodio e potassio sierico

Glicemia

Creatininemia

BUN

Leucociti

ematocrito

albumina

Bilirubina

Fattori addizionali:

Età, pregressa insufficienza d'organo, Immunosoppressione, pregressi interventi chirurgici

INDICI MULTIFATTORIALI IN CORSO DI P.A.

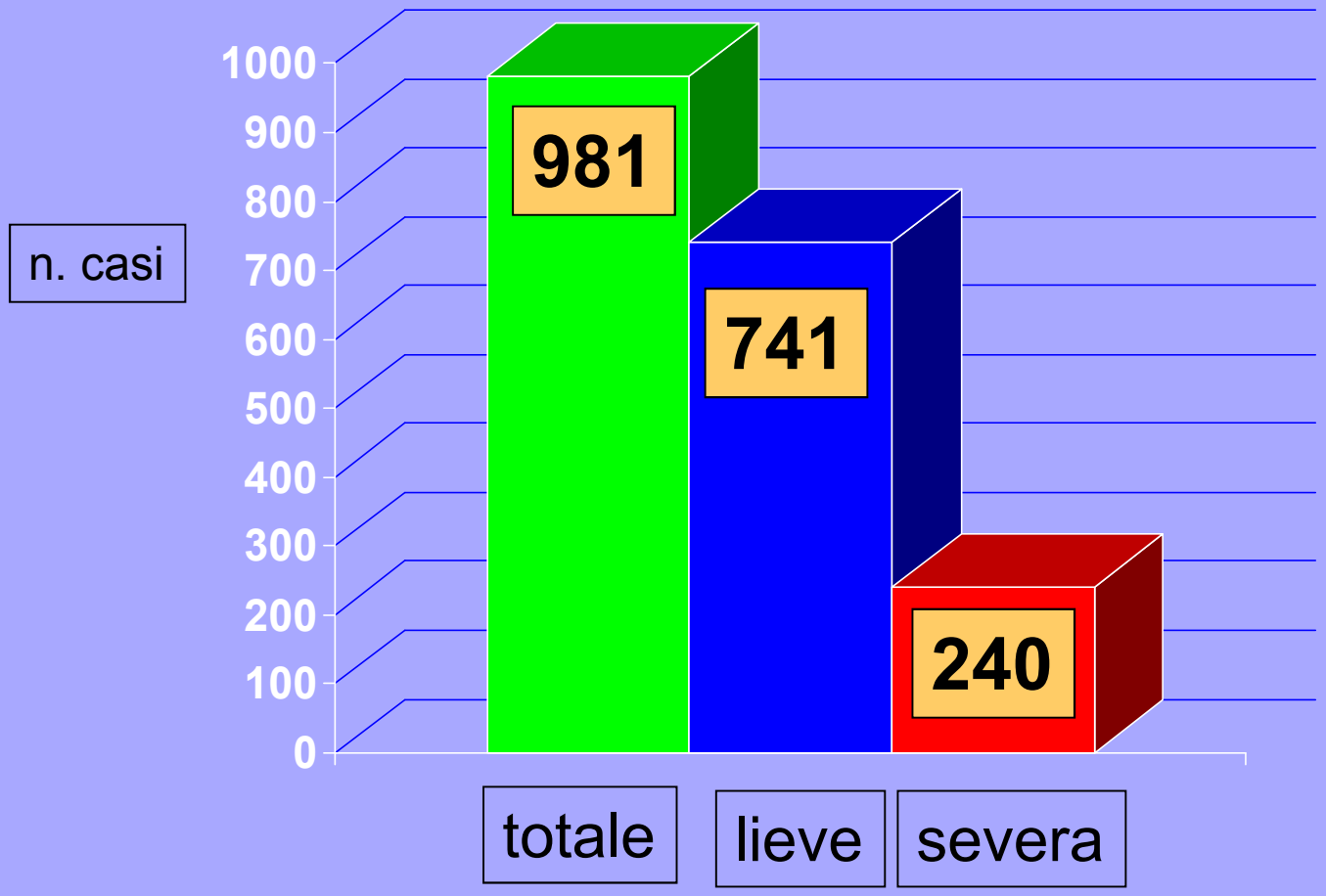
Indice di Glasgow

- Indice di Ranson
- Apache Score
- Proteina C reattiva
- Elastasi granulocitaria
- Interleuchine
- Rx Torace + creatininemia

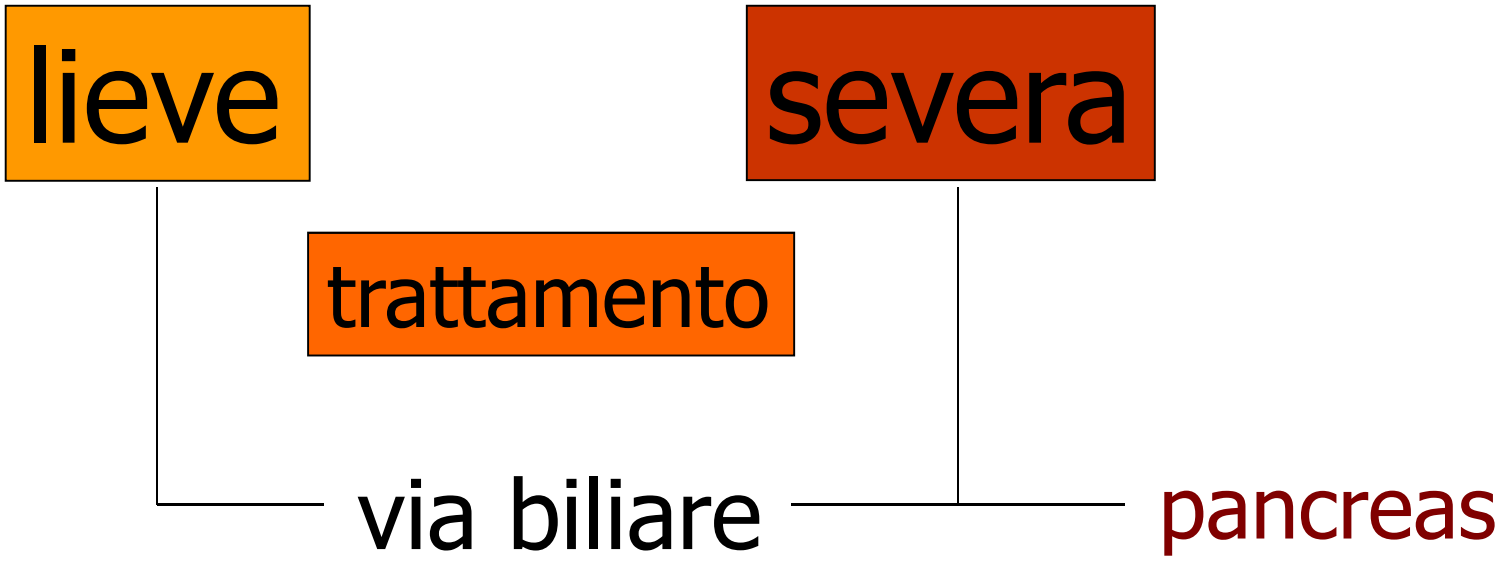
Età	> 55 anni
Globuli bianchi	> 15.000/mm^3
Glicemia	> 200 mg/100 ml
Azotemia	> 45 mg/100 ml
Ca^{2+}	< 8 mg/100 ml
Albuminemia	< 32 g/L
LDH	> 600 U/L
AST	> 200 U/L
PaO_2	< 60 mm Hg

Pancreatite acuta biliare

ProInf AISP 2001



Pancreatite acuta biliare

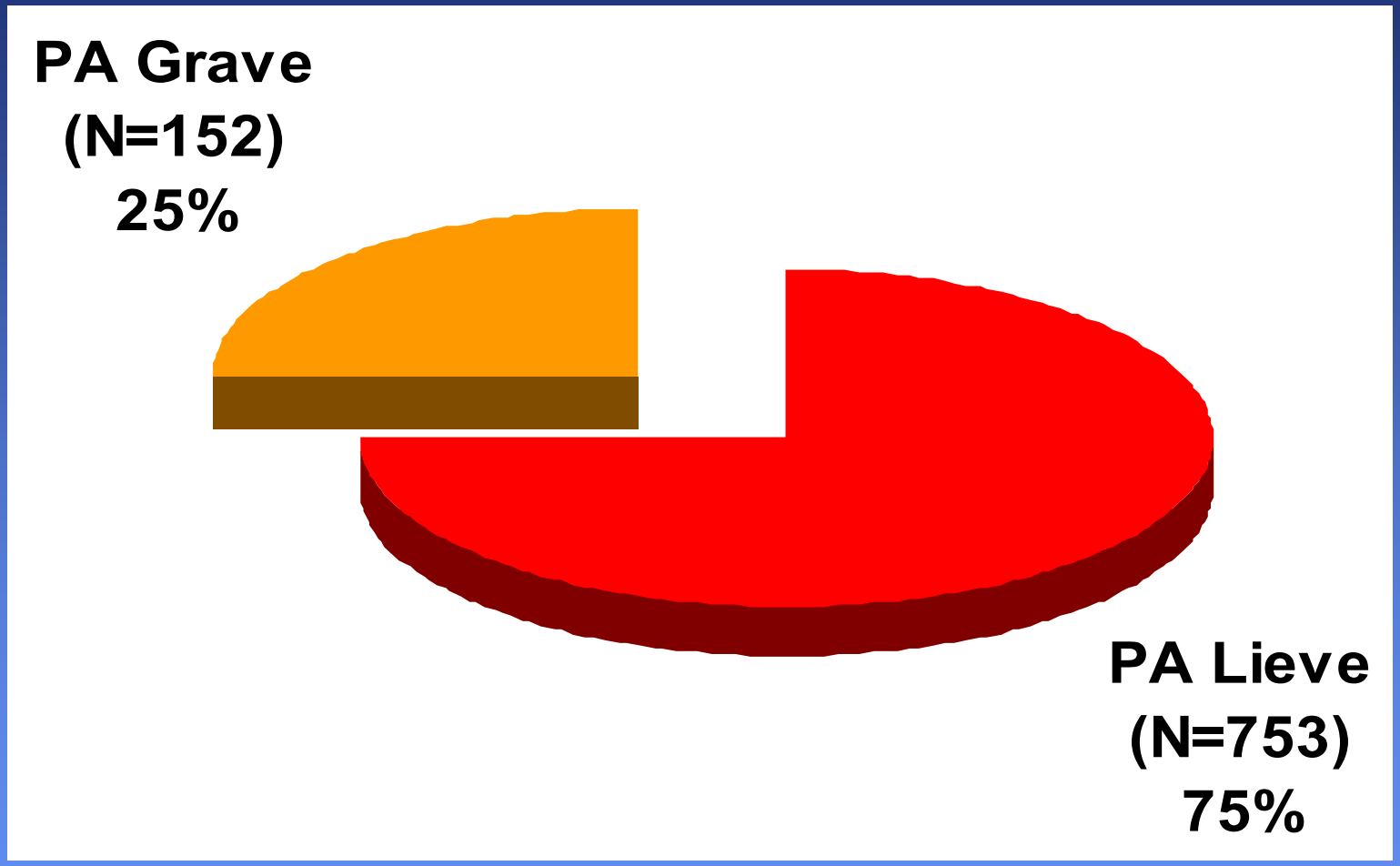


Mild acute pancreatitis
is not an indication for pancreatic surgery
Recommendation grade B

Pro-infAisp

Fase 1

Gravità



United Kingdom guidelines for the management of acute pancreatitis. British Society of Gastroenterology.Gut 1998; 42 Suppl 2:S1-13.
Uomo G, Pezzilli R, Cavallini G. Management of acute pancreatitis in clinical practice. Ital J Gastroenterol Hepatol 1999;31:635-42

Severity Assessment

- All patients should be considered as suffering from severe acute pancreatitis until proven otherwise (Recommendation Grade C)
- Severity stratification should be made in all patients within 48 hours of admission (Recommendation Grade B)
- A dynamic CT scan should be performed in all severe cases between three and 10 days after admission (Recommendation Grade B)

The APACHE II Score

Physiologic Variable	High Abnormal Range					Low Abnormal Range			
	+4	+3	+2	+1	0	+1	+2	+3	+4
Rectal Temp (°C)	≥41	39-40.9		38.5-38.9	36-38.4	34-35.9	32-33.9	30-31.9	≤29.9
Mean Arterial Pressure (mmHg)	≥160	130-159	110-129		70-109		50-69		≤49
Heart Rate	≥100	140-179	110-139		70-109		50-69	40-54	≤39
Respiratory Rate	≥50	35-49		25-34	12-24	10-11	6-9		≤5
Oxygenatation a) $FIO_2 \geq 0.5$ record $A\text{-}aDO_2$ b) $FIO_2 < 0.5$ record PaO_2	≥500	350-499	200-349		<200 PO_2>70	PO_2 61-70		PO_2 55-60	PO_2<55
Arterial pH	≥7.7	7.6-7.69		7.5-7.59	7.33-7.49		7.25-7.32	7.15-7.24	<7.15
HCO_3 (mEq/l)	≥52	41-51.9		32-40.9	22-31.9		18-21.9	15-17.9	<15
K (mEq/l)	≥7	6-6.9		5.5-5.9	3.5-5.4	3-3.4	2.5-2.9		<2.5
Na (mEq/l)	≥100	160-179	155-159	150-154	130-149		120-129	111-119	≤110
S. Creat (mqm/dl)	≥3.5	2-3.4	1.5-1.9		0.6-1.4		<0.6		
Hematocrit (%)	≥60		50-59.9	46-49.9	30.45.9		20-29.9		<20
TLC (10^3/cc)	≥40		20-39.9	15-19.9	3-14.9		1-2.9		<1
GCS									

Age -score

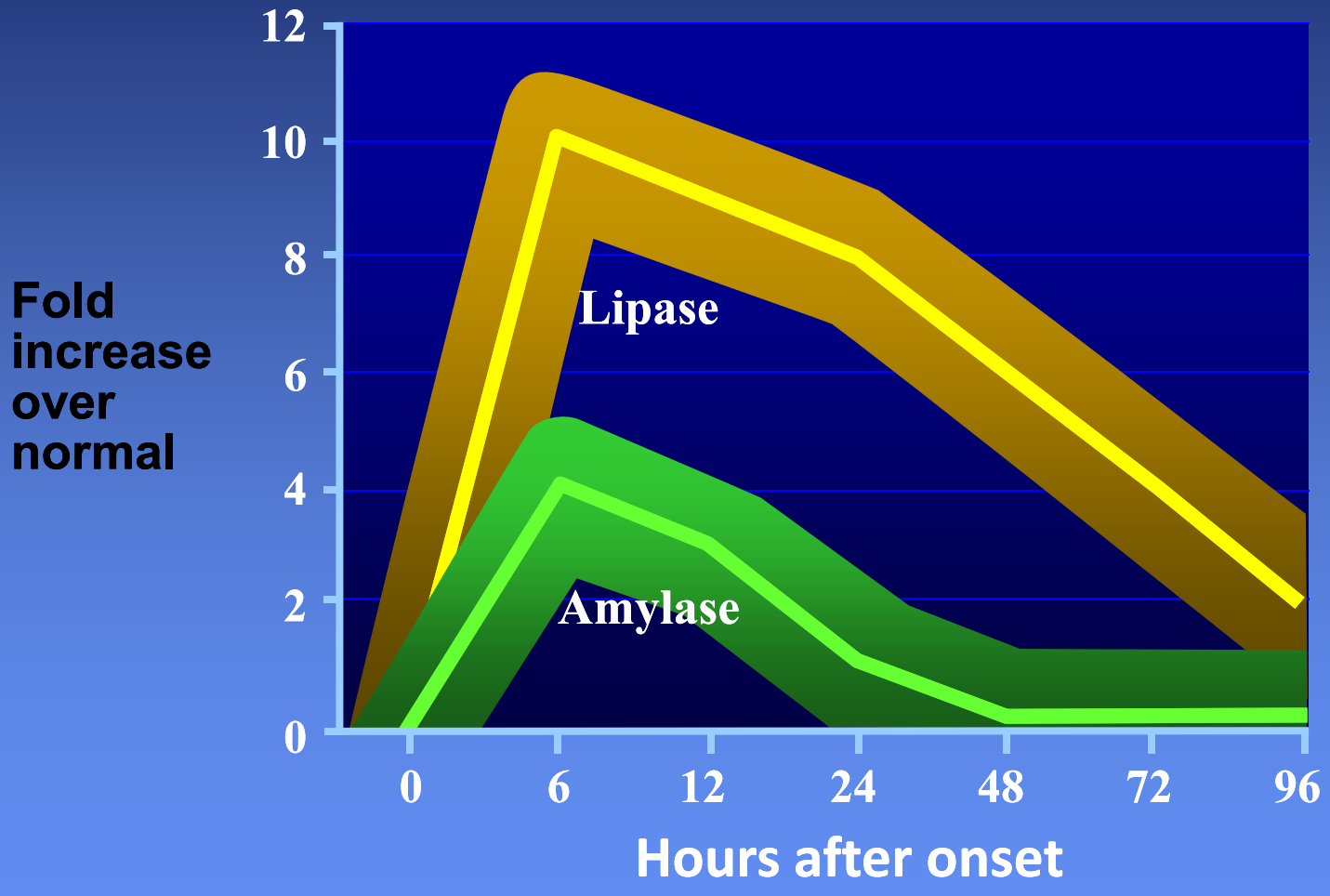
<44 → 0
45-54 → 2
55-64 → 3
65-74 → 5
≥75 → 6

GCS:

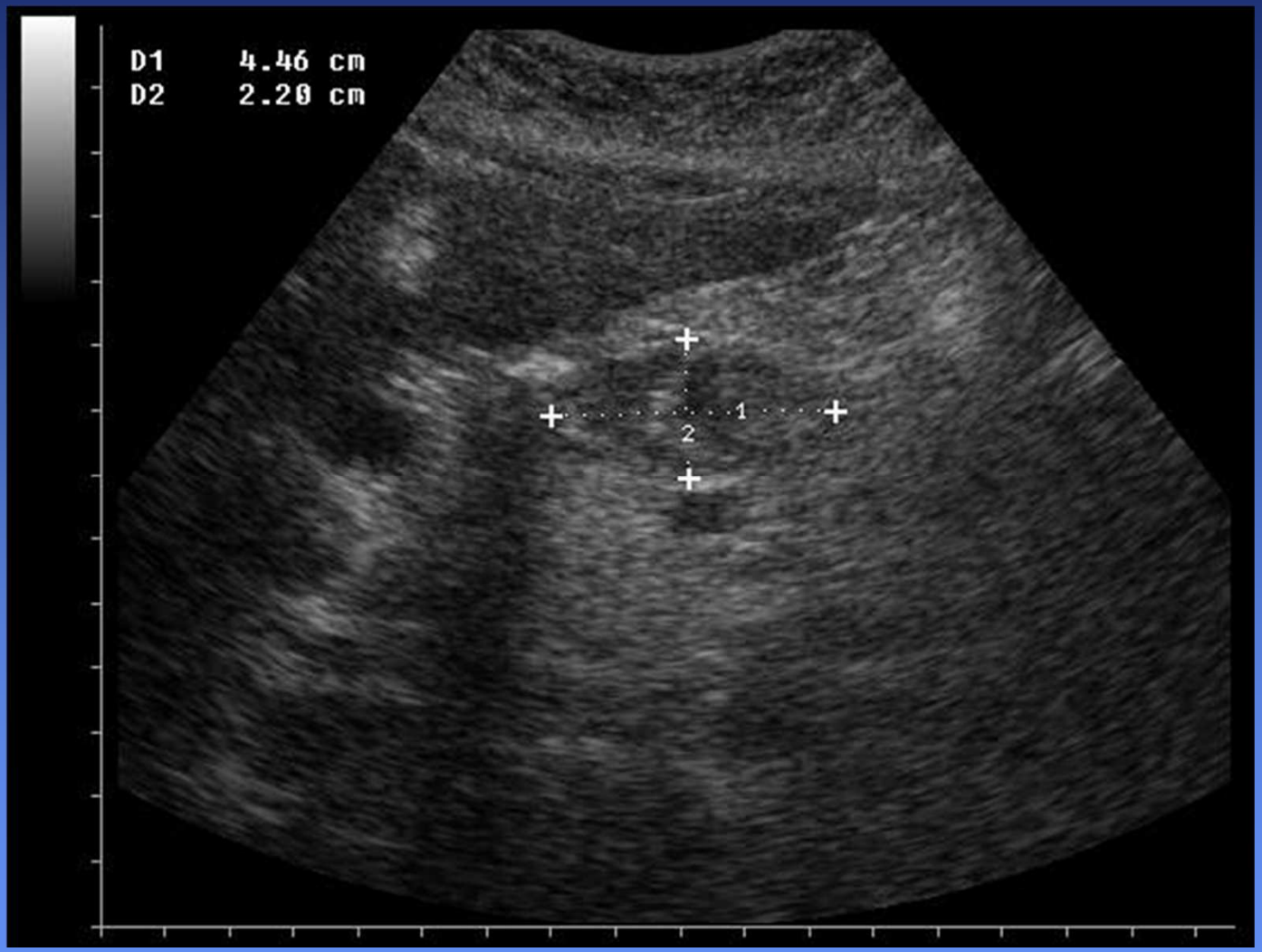
15 → 0	14 → 1	13 → 2
12 → 3	11 → 4	10 → 5
9 → 6	8 → 7	7 → 8
6 → 9	5 → 10	4 → 11
3 → 12		

JAMA 1993;270(24):2957-2963

Acute Pancreatitis: Time course of enzyme elevations



Ecografia Addominale



Finestra Terapeutica