What would be the role of angiography in ED in the future?

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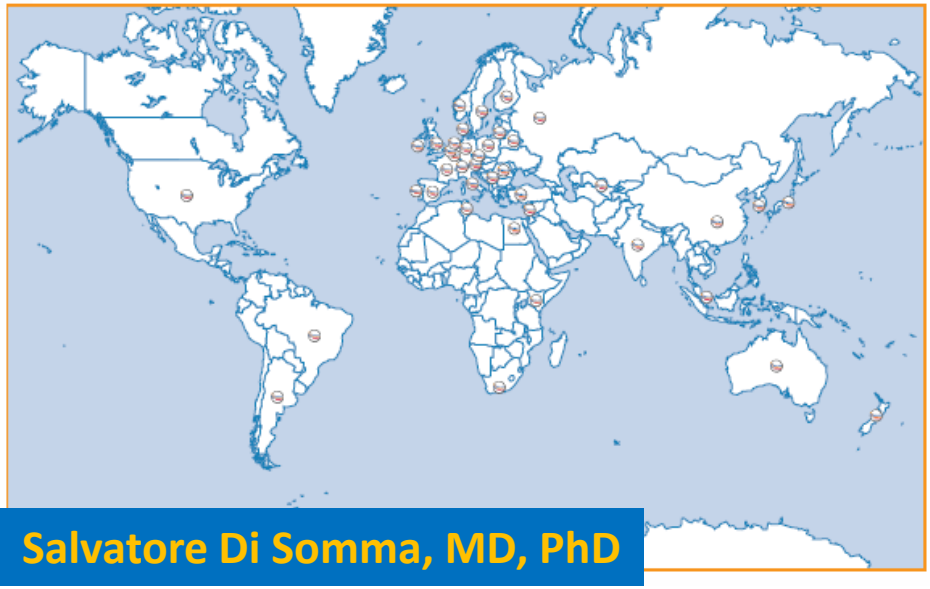

15TH NATIONAL EMERGENCY MEDICINE CONGRESS

6TH INTERCONTINENTAL EMERGENCY MEDICINE CONGRESS

6TH INTERNATIONAL CRITICAL CARE AND EMERGENCY MEDICINE CONGRESS

April 25-28, 2019
Kaya Palazzo Golf Resort Hotel
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ATUDER
Acil Tıp Uzmanları Derneği

EPAT
Emergency Physicians Association of Turkey

Salvatore Di Somma, MD, PhD

Professor of Internal and Emergency Medicine
Director Postgraduate School of Emergency Medicine
Faculty od Medicine and Psicology,
Sapienza University of Rome Italy
Visiting Professor ED UCSD San Diego USA
Expert Professor University of Lund Sweden
President GREAT –Network Italy

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Disclosures

Consultant:

- Novartis;
- Alere;
- Abbott;
- Adrenomed;
- Sphingotec;
- Ortho Clinical Diagnostics;
- NI Medical
- TEVA
- T2 Biosystems

Research Grants:

GE;
Sphingotec;
Novartis;
Biomerieux;

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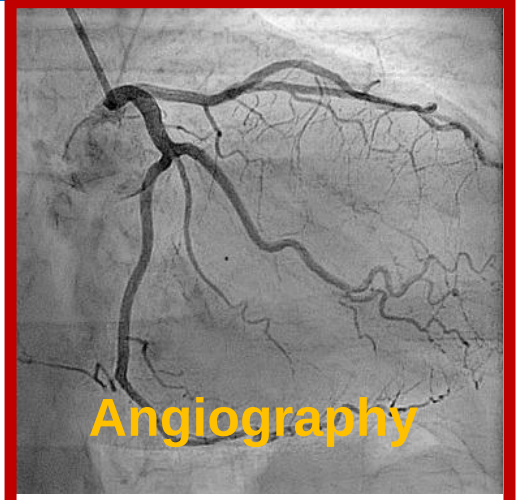
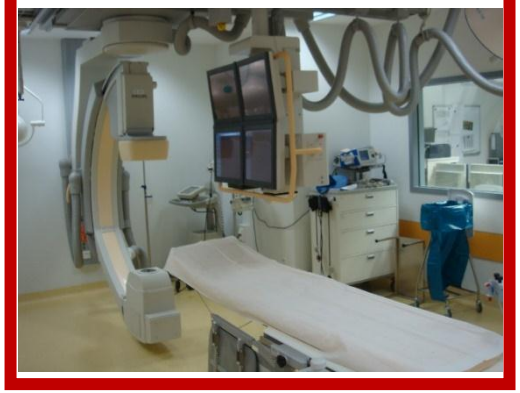
Technology Support to Clinical Evaluation in Acute Diseases

BIOMARKERS

IMAGING





Twanmoh J.R. et Al. . When overcrowding paralyzes an ED. Manag Care 2006.

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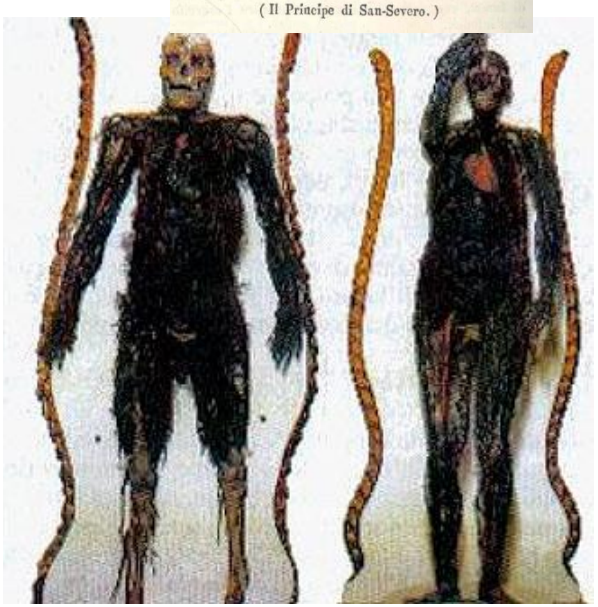
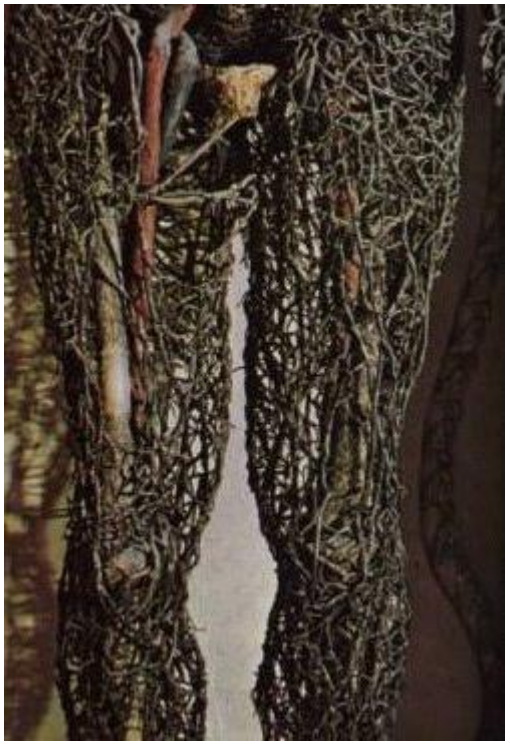
First Experiment of Angiography ” in Vivo”





Raimondo Di Sangro .Prince of San Severo
San Severo Chapel Naples Italy 1763

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Angiography

- Angiography is an invasive medical **imaging technique utilizing injection of radio-opaque contrast agent (**iodinated contrast material) **to visualize the lumen of blood vessels;**

- It can be used to look at blood vessels in many areas of the body, including : **brain, neck, heart, aorta, chest, pulmonary circuit, kidneys, gastrointestinal tract, and limbs.**

home/medterms medical dictionary a-z list / *angiography definition*

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Diagnostic and therapeutic goals

- Nowadays, the study of blood vessels occurs in many cases in a non-invasive or less invasive way using:US, echo-Doppler, CT and MRI…

- **Catheter angiography remains widely used in patients who need Emergency surgery or <u>therapeutic procedures performed by interventional radiology.</u>**

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Question # 1

How many of you
do currently have
an Angiography Service
Available 24/ 7
in your Emergency Department?

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Increasing Reasons to Perform Angiography in the Emergency setting

- STEMI/NSTEMI;
- Massive Pulmunary Embolism;
- Aortography;
- Acute limb ischemia;
- Ischemic and Hemorrhagic Stroke;
- Trauma;
- Gastrointestinal Acute bleeding and Ischemia.

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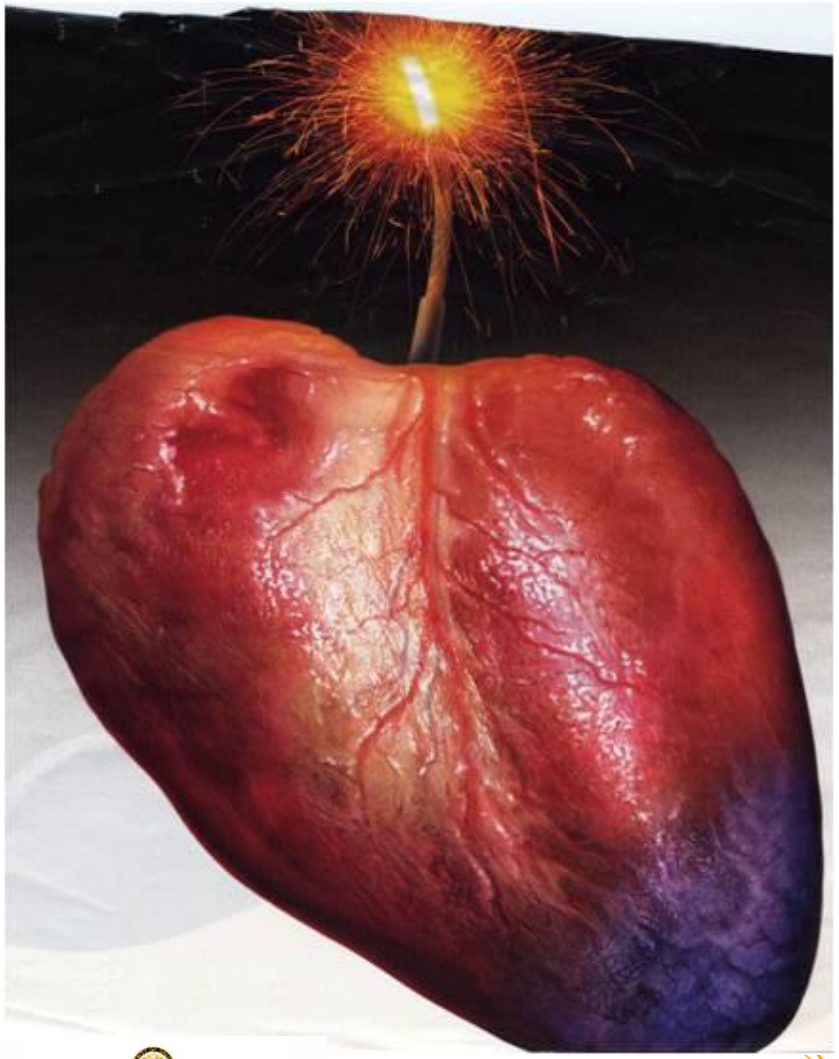
in ACS:Time is Myocardium!

We need to start the right treatment in ED asap!



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Primary PTCA in STEMI

ESC European Society of Cardiology
European Heart Journal (2019) **40**, 87–165
doi:10.1093/eurheartj/ehy394

Primary percutaneous coronary intervention for myocardial reperfusion in ST-elevation myocardial infarction: indications and logistics

Recommendations	Class[a]	Level[b]
Indication		
Reperfusion therapy is indicated in all patients with time from symptom onset <12 h duration and persistent ST-segment elevation.[200,201,236]	I	A
In the absence of ST-segment elevation, a primary PCI strategy is indicated in patients with suspected ongoing ischaemic symptoms suggestive of MI and at least one of the following criteria present: • haemodynamic instability or cardiogenic shock • recurrent or ongoing chest pain refractory to medical treatment • life-threatening arrhythmias or cardiac arrest • mechanical complications of MI • acute heart failure • recurrent dynamic ST-segment or T-wave changes, particularly with intermittent ST-segment elevation.	I	C
A primary PCI strategy is recommended over fibrinolysis within the indicated time frames.[200,201,237,238]	I	A
In patients with time from symptom onset >12 h, a primary PCI strategy is indicated in the presence of ongoing symptoms or signs suggestive of ischaemia, haemodynamic instability, or life-threatening arrhythmias.	I	C
A routine primary PCI strategy should be considered in patients presenting late (12–48 h) after symptom onset.[233,234,239]	IIa	B

2018 ESC/EACTS Guidelines on myocardial revascularization

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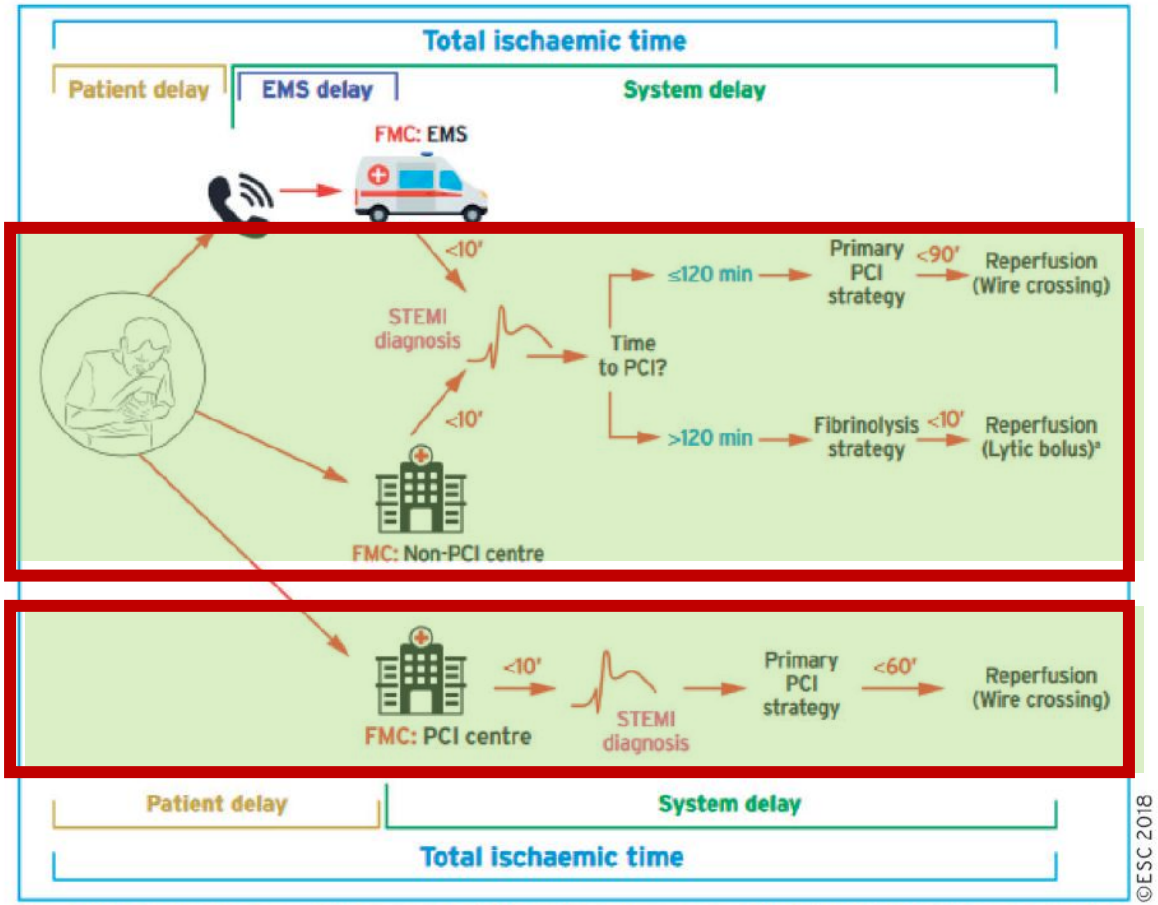
Ideal Time to PTCA in STEMI

ESC European Society of Cardiology
European Heart Journal (2019) **40**, 87–165
doi:10.1093/eurheartj/ehy394



The recommended mode of patient presentation is by alerting the EMS (call national emergency number: 112 or similar number according to region). When STEMI diagnosis is made in the out-of-hospital setting (via EMS) or in a non-PCI centre, the choice of reperfusion strategy is based on the estimated time from STEMI diagnosis to PCI-mediated reperfusion (wire crossing). System delay for patients alerting the EMS starts at the time of phone alert, although FMC occurs when the EMS arrives at the scene. EMS = emergency medical service.
FMC = first medical contact; PCI = percutaneous coronary intervention; STEMI = ST-segment elevation myocardial infarction. 'denotes minutes.
*Patients receiving fibrinolysis should be transferred to a PCI centre immediately after administration of the lytic bolus.

2018 ESC/EACTS Guidelines on myocardial revascularization

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PTCA in NSTEMI

ESC European Society of Cardiology
European Heart Journal (2019) **40**, 87–165
doi:10.1093/eurheartj/ehy394

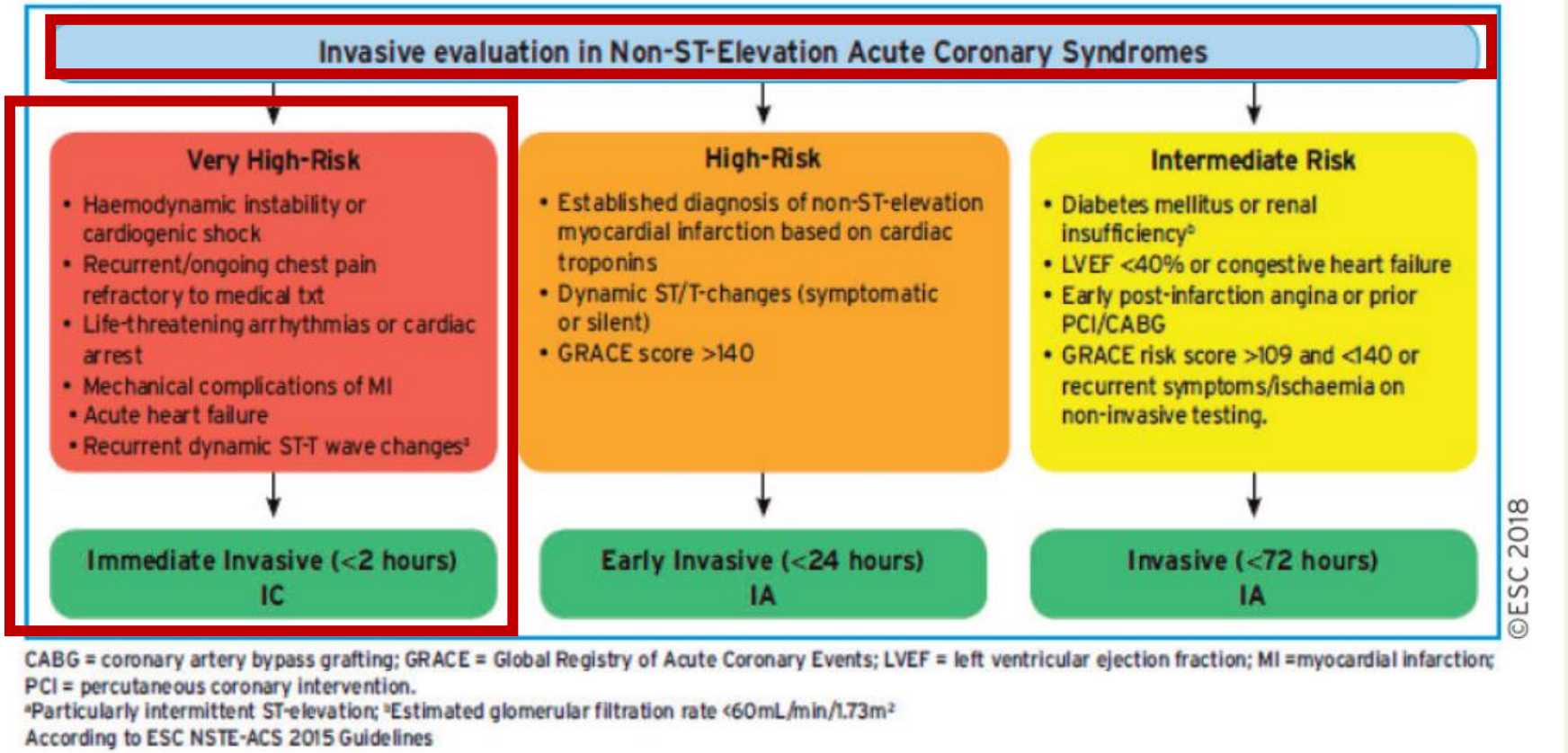

Figure 4 Selection of non-ST-elevation acute coronary syndrome treatment strategy and timing according to initial risk stratification.

2018 ESC/EACTS Guidelines on myocardial revascularization

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Society of Interventional Radiology Position Statement on Catheter-Directed Therapy for Acute Pulmonary Embolism

William T. Kuo, MD, Akhilesh K. Sista, MD, Salomão Faintuch, MD, MSc, Sean R. Dariushnia, MD, Mark O. Baerlocher, MD, Robert A. Lookstein, MD, MS, Ziv J Haskal, MD, Boris Nikolic, MD, MBA, and Joseph J. Gemmete, MD

STATEMENT

The Society of Interventional Radiology (SIR) considers the use of catheter-directed therapy (CDT) or thrombolysis to be an acceptable treatment option for carefully selected patients with massive (ie, high-risk) pulmonary embolism (PE) involving the proximal pulmonary arterial vasculature, in accordance with multidisciplinary guidelines (1–4). SIR defines acute proximal PE as new main or lobar emboli identified on radiographic imaging within 14 days of PE symptoms. In addition, SIR encourages the investigative use of CDT and new endovascular techniques in prospective outcomes studies and clinical trials, with particular attention to patients with acute submassive (ie, intermediate-risk) PE.

J Vasc Interv Radiol 2018; 29:293–297

Aortography: indications

- Abnormalities including :**acute traumatic injury, dissection, aneurysm**, occlusive disease, aortitis, and congenital anomaly;

- **Spontaneous hemorrhage.**

2017 ACR- SIR-SPR Practice parameter for performance of arteriography

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Journal of the American College of Cardiology
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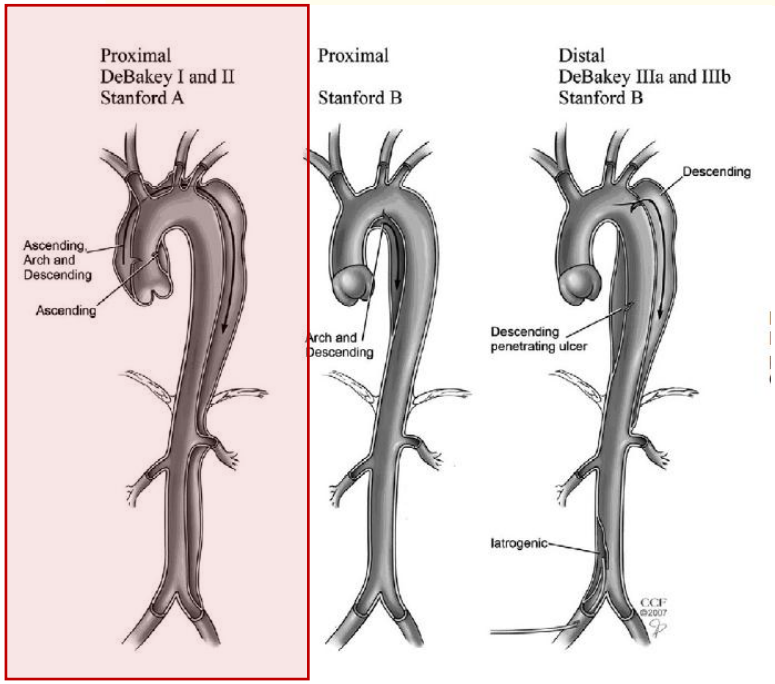
ISSN 0735-1097/10/$36.00
doi:10.1016/j.jacc.2010.02.015

PRACTICE GUIDELINE: FULL TEXT

2010 ACCF/AHA/AATS/ACR/ASA/SCA/SCAI/SIR/STS/SVM Guidelines for the Diagnosis and Management of Patients With Thoracic Aortic Disease



8.6.4. Recommendation for Surgical Intervention for Acute Thoracic Aortic Dissection

CLASS I

1. **For patients with ascending thoracic aortic dissection, all of the aneurysmal aorta and the proximal extent of the dissection should be resected. A partially dissected aortic root may be repaired with aortic valve resuspension. Extensive dissection of the aortic root should be treated with aortic root replacement with a composite graft or with a valve sparing root replacement. If a DeBakey Type II dissection is present, the entire dissected aorta should be replaced. (*Level of Evidence: C*)**

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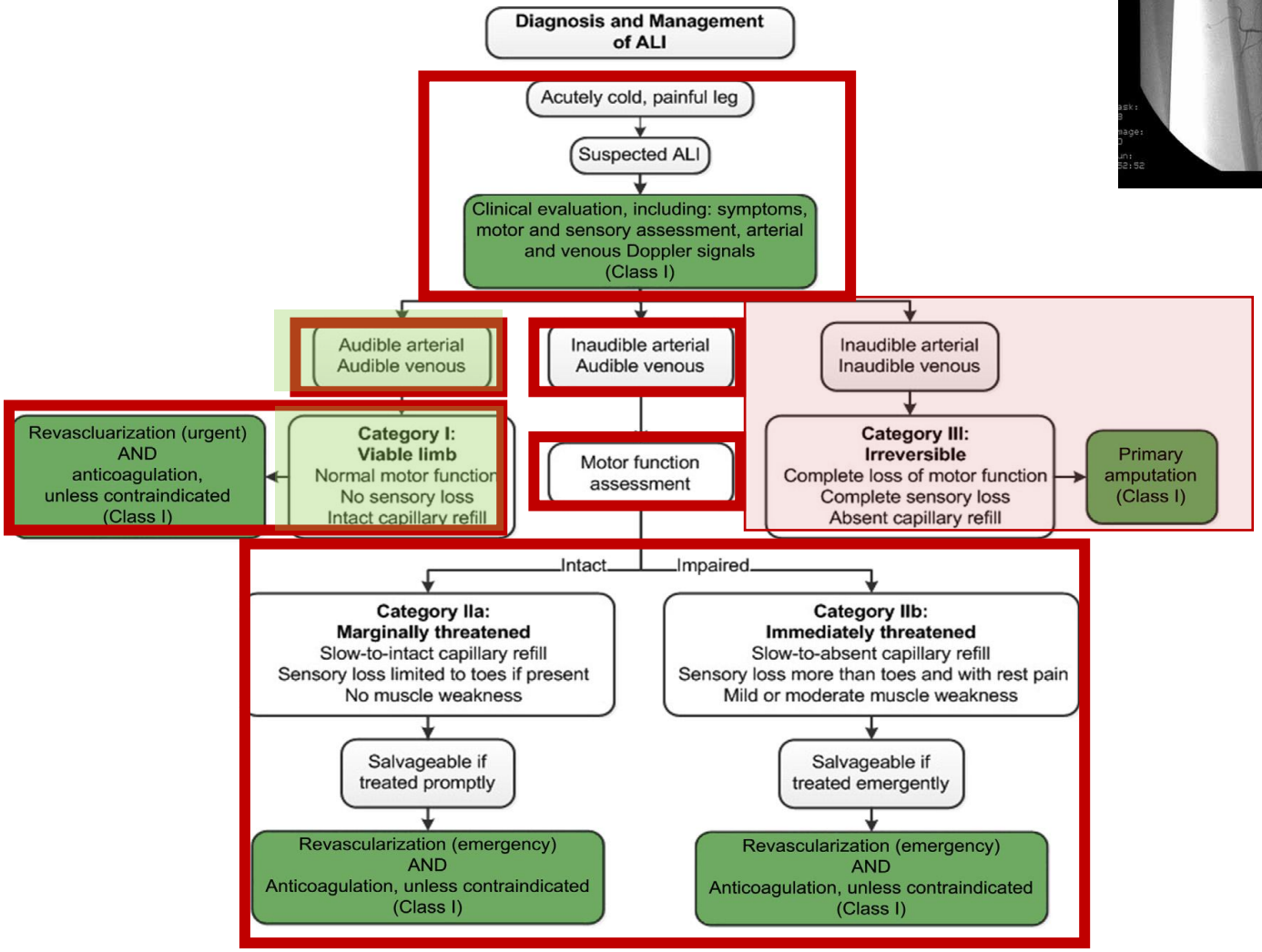
Acute limb ischemia



2016 AHA/ACC Guideline on the management of patients with lower extremity peripheral artery disease

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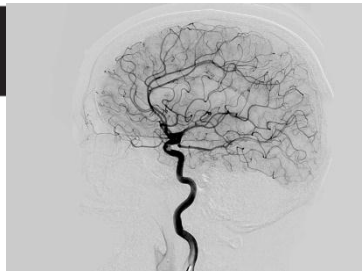
AHA/ASA Guideline



2018 Guidelines for the Early Management of Patients With Acute Ischemic Stroke

A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association

3.7. Mechanical Thrombectomy (Continued)	COR	LOE
3. Patients should receive mechanical thrombectomy with a stent retriever if they meet all the following criteria: (1) prestroke mRS score of 0 to 1; (2) causative occlusion of the internal carotid artery or MCA segment 1 (M1); (3) age ≥18 years; (4) NIHSS score of ≥6; (5) ASPECTS of ≥6; and (6) treatment can be initiated (groin puncture) within 6 hours of symptom onset.	I	A

Stroke. 2018;49:e46

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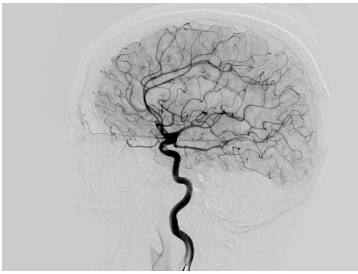
AHA/ASA Guideline



2018 Guidelines for the Early Management of Patients With Acute Ischemic Stroke

A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association

5. Multicomponent quality improvement initiatives, which include ED education and multidisciplinary teams with access to neurological expertise, are recommended to safely increase IV thrombolytic treatment.

I	A

2. Mechanical thrombectomy requires the patient to be at an experienced stroke center with rapid access to cerebral angiography, qualified neurointerventionalists, and a comprehensive periprocedural care team. Systems should be designed, executed, and monitored to emphasize expeditious assessment and treatment. Outcomes for all patients should be tracked. Facilities are encouraged to define criteria that can be used to credential individuals who can perform safe and timely intra-arterial revascularization procedures.

I	C-EO

Stroke. 2018;49:e46

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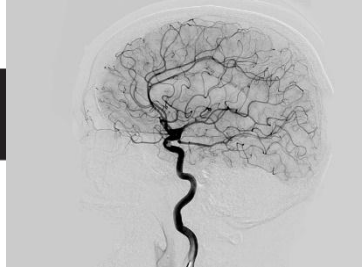
AHA/ASA Guideline



Guidelines for the Management of Spontaneous Intracerebral Hemorrhage

A Guideline for Healthcare Professionals From the American Heart Association/American Stroke Association

Patients with cerebellar hemorrhage who are deteriorating neurologically or who have brainstem compression and/or hydrocephalus from ventricular obstruction should undergo surgical removal of the hemorrhage as soon as possible *(Class I; Level of Evidence B)*. (Unchanged from the previous guideline)

Stroke. 2015;46:2032-2060.

In cases where the Hemorrhage is due to an aneurysm rupture it appears to be equally effectively to treat either by coiling or clipping, **coiling is the preferred treatment** (class I, level A)

European Stroke organization guidelines 2016

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Arteriography in trauma patients: indications

ATLS®
ADVANCED TRAUMA LIFE SUPPORT

- To guide the surgical treatment of a damaged limb artery;
- To correct incontrollable internal bleeding (surgical - sparing treatment) of:
  i. liver
  ii. spleen
  iii. kidney
  iv. Vascular
  v. others

2017 ACR- SIR-SPR Practice parameter for performance of arteriography

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Liver trauma

Table 1 AAST Liver Trauma Classification

Grade	Injury type	Injury description
I	Haematoma	Subcapsular <10 % surface
	Laceration	Capsular tear <1 cm parenchymal depth
II	Haematoma	Subcapsular 10–50 % surface area; intraprenchymal, <10 cm diameter
	Laceration	1–3 cm parenchymal depth, <10 cm in length
III	Haematoma	Subcapsular >50 % surface area or expanding, ruptured subcapsular or parenchymal haematoma. Intraprenchymal haematoma >10 cm
	Laceration	>3 cm parenchymal depth
IV	Laceration	Parenchymal disruption 25–75 % of hepatic lobe
	Vascular	Juxtavenous hepatic injuries i.e. retrohepatic vena cava/centrl major hepatic veins
VI	Vascular	Hepatic avulsion

Advance one grade for multiple injuries up to grade III
AAST liver injury scale (1994 revision)

The WSES Classification divides Hepatic Injuries into three classes:

- Minor (WSES grade I).
- Moderate (WSES grade II).
- Severe (WSES grade III and IV).

The classification considers either the AAST classification either the hemodynamic status and the associated lesions (Table 2).

Minor hepatic injuries:

- *WSES grade I* includes AAST grade I-II hemodynamically stable either blunt or penetrating lesions.

Moderate hepatic injuries:

- *WSES grade II* includes AAST grade III hemodynamically stable either blunt or penetrating lesions.

Severe hepatic injuries:

- *WSES grade III* includes AAST grade IV-VI hemodynamically stable either blunt or penetrating lesions.
- *WSES grade IV* includes AAST grade I-VI hemodynamically unstable either blunt or penetrating lesions.

WSES classification and guidelines for liver Trauma - 2016

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Liver trauma Algorithym

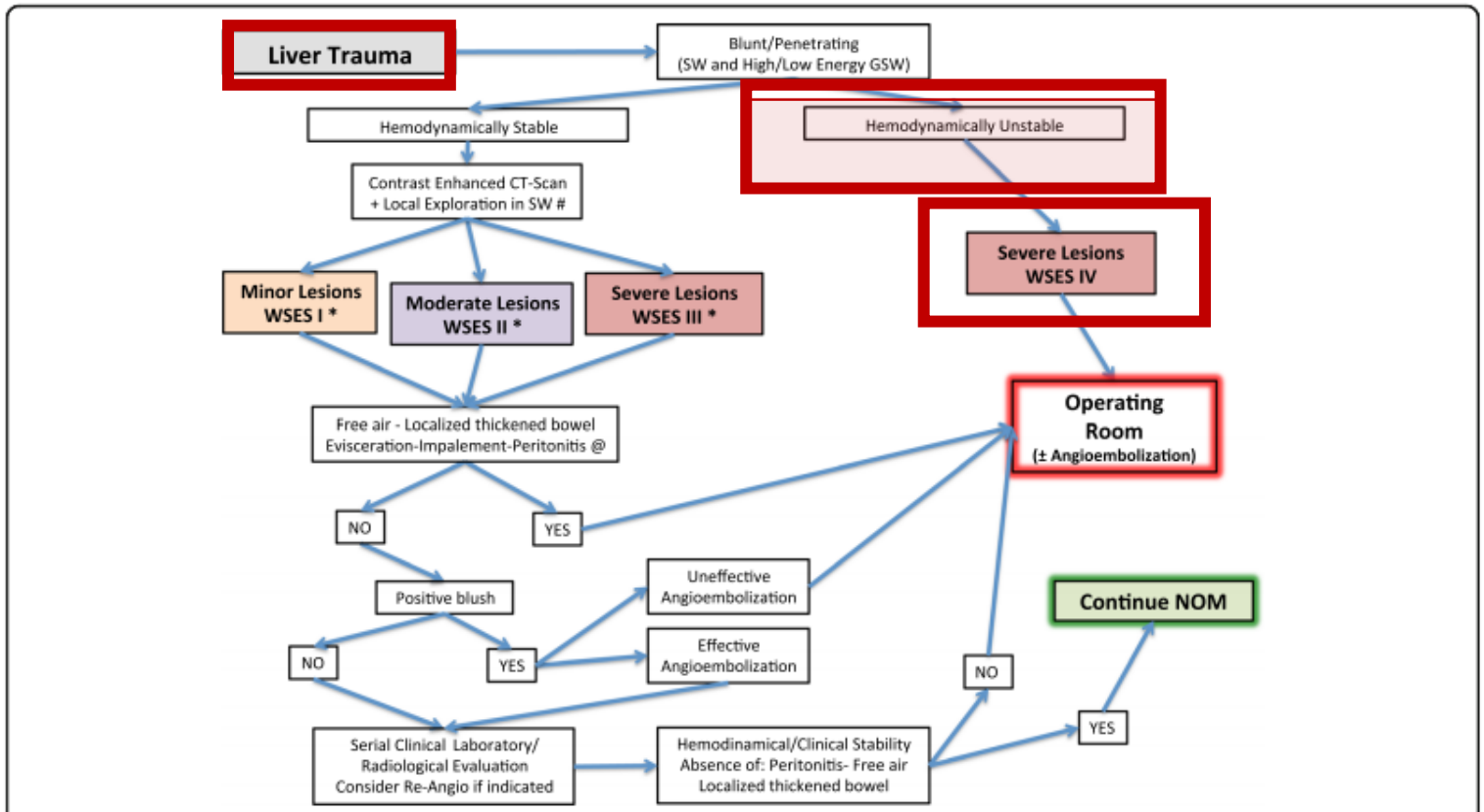

Fig. 1 Liver Trauma Management Algorithm. (*SW* Stab Wound, *GSW* Gun Shot Wound; *NOM should only be attempted in centers capable of a precise diagnosis of the severity of liver injuries and capable of intensive management (close clinical observation and haemodynamic monitoring in a high dependency/intensive care environment, including serial clinical examination and laboratory assay, with immediate access to diagnostics, interventional radiology and surgery and immediately available access to blood and blood products; # wound exploration near the inferior costal margin should be avoided if not strictly necessary because of the high risk to damage the intercostal vessels; @ extremely selected patients hemodynamically stable with evisceration and/or impalement and/or diffuse peritonitis with the certainty of an exclusive and isolated abdominal lesion could be considered as candidate to be directly taken to the operating room without contrast enanched CT-scan)

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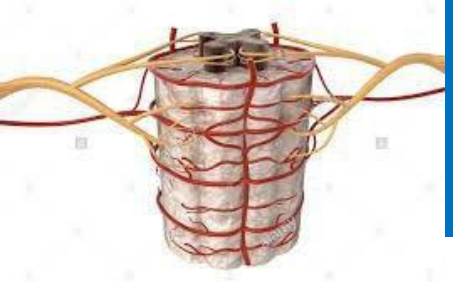

Spinal arteriography: Indications

- Spine and spinal cord tumors
- Vascular malformations
- **Spinal trauma**
- Preoperative evaluation prior to open or endovascular aortic or spinal surgery
- **Spontaneous hemorrhage**

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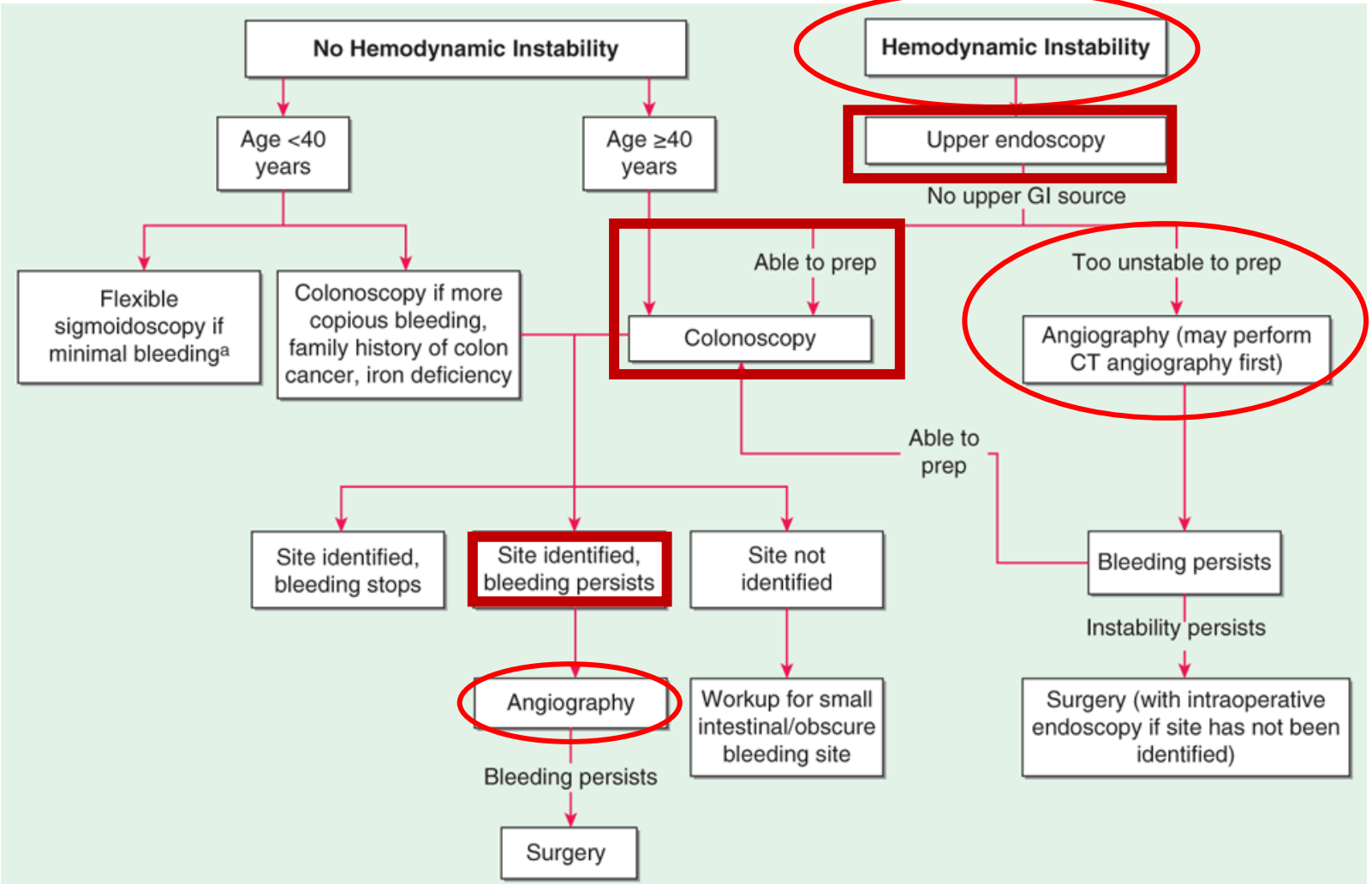
Acute gastrointestinal bleeding



Transcatheter Angiography Guided Embolization

Table 1
Success Rates for Percutaneous Transcatheter Embolization

	Reported Success Rates (%)	Suggested Threshold (%)
Bronchial arteries (3,47,55–58,92,93)		
Initial success (all indications)	70–100	85
1-y success (all indications)	64–82	70
Aspergillosis and malignancy clinical success*	58–67	60
Cystic fibrosis*		
Clinical success	95	85
9-mo success	64–68	65
Pulmonary artery arteriovenous malformation (24,48)	96	90
Renal arteries (21,54,61,63,75)		
Nonneoplastic	64–100	90
Malignant	64–100	75
Preoperative	79–100	90
Selective	82–100	90
Hypogastric/lumbar (16,17,42,43,54,94,95)		
Obstetric/gynecologic (benign and malignant)	88–100	95
Clinical success rates in patients with malignancy	60	40
Trauma	93–95	90
Overall	88–100	95
Endoleak (type II) (80–85)		
Technical success	92–100	90
Clinical success	40–100	85
Gastrointestinal (5,12,27–30,31,33,34)		
Upper gastrointestinal bleeding	62–100	75
Focal gastroesophageal (Mallory-Weiss, gastric ulcer)	71–100	90
Hemorrhagic gastritis (vasopressin or embolization)	25–78	70
Duodenal ulcer (benign)	72–100	
Technical success		90
Clinical success		60
Lower gastrointestinal bleeding (95,96)	95	90
Pancreatic (10,20)	100	90
Splenic (38,66,74,97–100) (trauma and hypersplenism)	87–100	95
Portal vein embolization (78,79,101,102)		
Technical success	99–100	95
Adequate left lobe hypertrophy for surgery	85–86	85
Varicocele (68–72)		
Success	83–96	90
Recurrence (after 6 wk)	7–16	16
Overall suggested technical success rate		95
Overall suggested clinical success rate		85
Pelvic congestion syndrome (103–105)		
Success	100	95
Clinical success	83	83

Acute Mesenteric ischemia

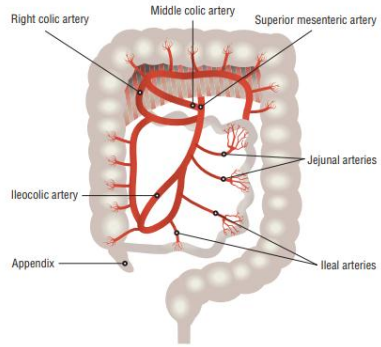


Fig 1 Distribution of blood supply to the small intestine and colon from the superior mesenteric artery, branches of which include the middle, right, and ileocolic arteries as well as jejunal and ileal arteries and arterioles

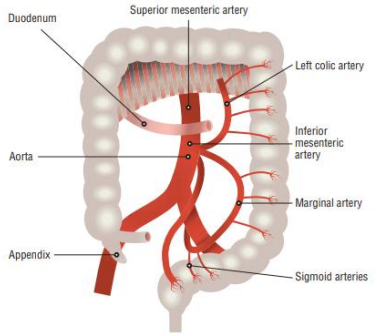


Fig 2 Distribution of blood flow to the colon originating from the inferior mesenteric artery, branches of which include the left colic, marginal, and sigmoid arteries and supply the left colon and superior portion of the rectum

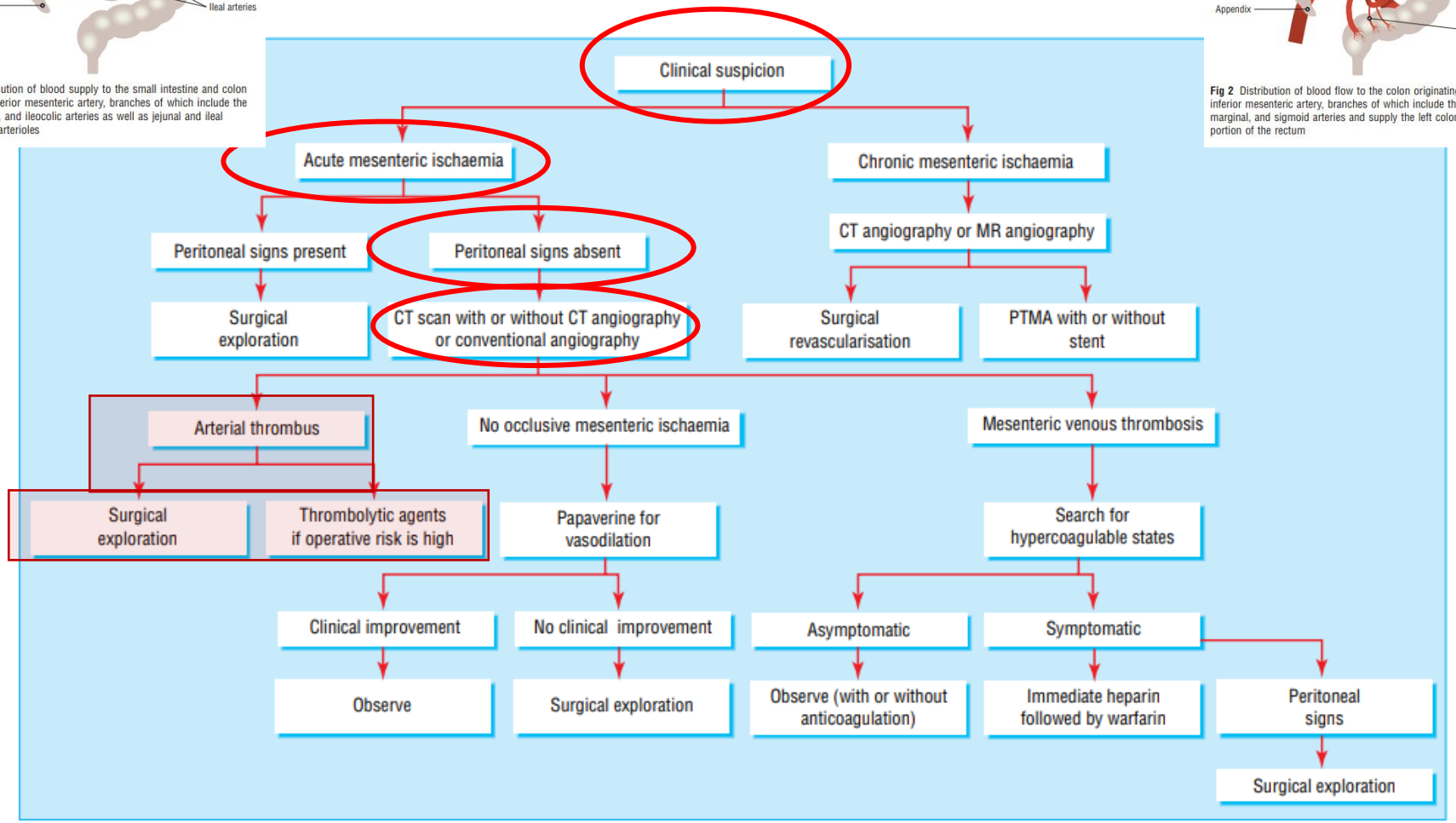


Fig 3 Management of mesenteric ischaemia. CT=computed tomography; MR=magnetic resonance; PTMA=percutaneous transluminal mesenteric angioplasty

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General contraindications

- There are no absolute contraindications to arteriography.

Relative contraindications include:

1. **Severe hypertension;**
2. Uncorrectable coagulopathy or thrombocytopenia;
3. **Clinically significant sensitivity to iodinated contrast material;**
4. **Renal insufficiency based on the estimated glomerular filtration rate (eGFR);**
5. Congestive heart failure;
6. Certain connective tissue disorders (reported complications at the puncture site).

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Emergency Department Overcrowding

..."and hospitals have closed 198,000 beds . With more patients needing care and fewer resources to care for them, emergency department crowding was inevitable." .

Arthur L. Kellermann, M.D., M.P.H

The NEW ENGLAND JOURNAL of MEDICINE

Volume 355:1300-1303, 2006, Number 13

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Conclusions

1. **After an ınıtıal Clınıcal and non ınvasıve Technology evaluatıon ,Angiography represents a cornerstone in various clinical critical situations in the ED;**
2. It allows to avoid more invasive options like surgery and their adverse effects and major costs;

1. **in the future… it would be of great importance to improve worlwide the use of both diagnostic and therapeutic angiography in the ED.**

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Published in final edited form as:

Acad Emerg Med. 2015 May ; 22(5): 625–631. doi:10.1111/acem.12640.

Optimizing Diagnostic Imaging in the Emergency Department

While emergency diagnostic imaging use has increased significantly, there is a lack of evidence for corresponding improvements in patient outcomes. Optimizing emergency department (ED) diagnostic imaging has the potential to improve the quality, safety, and outcomes of ED patients, but to date, there have not been any coordinated efforts to further our evidence-based knowledge

. The six components herein will serve as the group topics for the conference: 1) patient-centered outcomes research; 2) clinical decision rules; 3) training, education, and competency; 4) knowledge translation and barriers to image optimization; 5) use of administrative data; and 6) comparative effectiveness research: alternatives to traditional CT use.

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Question # 2

How many of you
Would like to have
in next Future
an Angiography Service
Available 24/ 7
in your Emergency Department?

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World Congress on Geriatric Emergency Medicine

UCSD La Jolla San Diego November 12-16 ;2020

June 27-28 2019

Royal College of Physicians of Edinburgh,
9 Queen Street, Edinburgh EH2 1JQ.

GREAT XII INTERNATIONAL MEETING

JUNE 27TH -28TH 2019

EDINBURGH - SCOTLAND

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