NEX-AID POLYTRAUMA PROTOCOL

Index:

1: Introduction

Trauma remains the leading cause of death in the population under 45 and globally accounts for about 16,000 deaths per day. The projections for 2121 show a number of deaths related to traumatic pathology of about 8.4 million.
The management of a major trauma patient involves a considerable commitment of human and technological resources whose integration and sharing is essential for optimizing the treatment pathway.
In an organized trauma system there is a clear reduction in patient mortality and morbidity, thus reducing not only the number of deaths but also health costs, hospitalization times and rehabilitation costs for residual disabilities.
The purpose of a treatment protocol for patients with major trauma is to define the indications, times and operating methods of medical intervention and diagnostic procedures.
The main points to be taken into consideration in the development of a protocol for the management of the polytrauma patient accompanied by the degree of scientific evidence when available are the following:

2: Polytrauma Definition

Polytrauma and **multiple trauma** are medical terms describing the condition of a person whose injuries involve multiple body regions, compromise the patient's physiology and potentially cause dysfunction of uninjured organs (13). The term is defined via an Injury Severity Score (ISS) equal to or greater than 16.[1] It has become a commonly applied term by US military physicians in describing the seriously injured soldiers returning from Operation Iraqi Freedom in Iraq and Operation Enduring Freedom in Afghanistan. The term is generic, however, it has been in use for a long time for any case involving multiple trauma. The expected higher risk of mortality of polytrauma patients is based on the assumption that the underlying pathophysiological response of the injured person would aggravate the clinical outcome. The injured person's pathophysiological response to the injury load, however, makes a differentiation between "polytrauma" and "multitrauma".

The addition of a relevant physiologic condition or pathophysiologic change in combination of AIS/ISS is reasonable to increase its predictive power for mortality.

Age, systolic blood pressure (SBP) and Glasgow Coma Scale (GCS) have been reported to have good predictive power for mortality [18]. An international consensus meeting in 2012 first tried to define polytrauma by combining the concept of injuries in different body regions and parameters of physiological response [19,20]. With the addition of at least one of five standardized physiological responses (hypotension [SBP ≤ 90 mmHg], unconsciousness [GCS score ≤ 8], acidosis [base excess ≤ −6.0], coagulopathy [partial thromboplastin time ≥ 40 s or international normalized ratio ≥ 1.4], and age [≥70 years]) in this new "Berlin definition" to the definition of ISS ≥ 16 and AIS ≥ 3 for at least two body regions, an improved definition of polytrauma was determined [13]. Notably, in the study that defines polytrauma as AIS ≥ 3 points for two or more different body regions, mortality was 11.4% and 11.0% in polytrauma and non-polytrauma patients, respectively. A mortality rate of 18.7% was found when polytrauma was defined using ISS ≥ 16 [13] and the mortality rates were increased to as high as 35–38% as soon as one other physiologic parameter was added [13].

3: Prehospital Triage:

To optimize the chances of correctly identifying patients with Major Trauma and establishing the most appropriate destination, the use of a triage test, integrated with clinical judgment, is recommended in the pre-hospital setting.
The use of pre-hospital triage tools in suspected major trauma must be carefully monitored through clinical audits that particularly analyse the performance of the tests used in terms of undertriage and overtriage.
In order to improve the accuracy of the triage and therefore a correct activation of the trauma team, the patient will be evaluated on the basis of anatomical factors, trauma kinetics and factors specific to the individual patient.
Other factors to consider for triage are the severity of the injuries, the chance of survival and the resources available.
In adult patients with suspected Major Trauma it is preferable to use the TRENAU (Northern French Alps Trauma System) triage tool to identify patients with suspected Major Trauma (defined as ISS> 15).
In the TRENAU system(fig. 1): Grade A patients are sent to the nearest level I, II, III trauma center, in the event of a technical stop at level III they are transferred as quickly as possible to higher levels. Grade B patients are referred to level I trauma center if with GCS <9 or spinal cord injury, at I or II trauma center level in other cases. Grade C patients are indifferently referred to the trauma centers of level I, II or III.

Il Northern French Alps Trauma System (TRENAU) (traduzione italiana)

GRADO A: instabili nonostante la rianimazione

- Pressione sistolica arteriosa < 90 mmHg nonostante l'utilizzo di farmaci vasopressori e più di 1 litro di soluzioni cristalloidi e/o trasfusioni pre-ospedaliere
- SpO2 < 90% nonostante l'utilizzo di ventilazione meccanica o l'utilizzo di maschere facciali ad alto flusso

GRADO B: stabilizzato dopo la rianimazione preospedaliara o criteri anatomici

- Pressione sistolica > 90 mmHg o SpO2 >90% dopo una resuscitazione iniziale
- Lesione cerebrale traumatica isolata con GCS< 13 o GCS sulla risposta motoria <5
- Sospetto di trauma del midollo spinale
- Fratture toraciche multiple e volet costale
- Trauma pelvico severo
- Ferita penetrante
- Amputazione o arto schiacciato

GRADO C: stabile con situazione in poteziale evoluzione o anamnesi medica a rischio

- Caduta da più di sei metri
- Vittima di esplosione o eiettata
- Decesso del passaggero accanto
- Valutazione della velocità: deformazione della vettura, no cintura di sicurezza, no casco
- Anamnesi medica: <5 anni o > 65 anni, in gravidanza, disordini di coagulazione

Fig. 1

Hemodynamic instability is defined in the presence of a systolic pressure lower than 90 mmHg despite the use of vasopressor drugs, and more than 1 liter of crystalloid solutions and / or pre-hospital transfusions. Respiratory instability is defined in the presence of a SpO2 <90% despite the use of mechanical ventilation or the use of high-oxygen flow face masks.
In adult patients with suspected Major Trauma, it is preferable to use the NTS tool (fig. 2) instead of RTS to identify individuals at risk of trauma-related death. Indeed, hypothermia does not allow for an adequate assessment of the GCS and affects the measurement of SO2 percentage.

Modification of the Revised Trauma Score

Revised Trauma Score				**New Trauma Score**		
Glasgow Coma Scale	**Systolic Blood Pressure**	**Respiratory Rate**	**Coded Value**	**Glasgow Coma Scale**	**Systolic Blood Pressure**	**Oxygen saturation**
13–15	>89	10–29	4	3–15	110–149	≥94
9–12	76–89	>29	3		≥150	80–93
6–8	50–75	6–9	2		90–109	60–79
4–5	1–49	1–5	1		70–89	40–59
3	0	0	0		<70	<40

Fig. 2

Triage tools should be used with caution in extreme age groups, in pregnant women, in patients on antiplatelet and / or anticoagulant therapy.
For the elderly, particular caution is recommended in the use of triage tools since the elderly have a greater likelihood of Major Trauma and the instruments tested may not be sufficiently sensitive in identifying it.
In paediatric age, especially within the age of 8, some triage tools do not give sufficient guarantees of avoiding undertriage, which is of the utmost importance in this subgroup. In this specific population the use of pre-hospital triage tools identified in the scientific literature to identify subjects with Major Trauma is not recommended.
Patients on oral anticoagulant or antiplatelet therapy have excess mortality from trauma (even if they have no significant association with ISS> 15).
For pregnant women, patients on antiplatelet or anticoagulant treatment or with chronic diseases, caution is recommended in the use of triage tests, as there is no indication of accuracy in these subgroups, but which could plausibly be at risk of undertriage.

4: Prehospital Management:

The treatment sequence first considers ABC priorities (airways with protection of the cervical spine, respiration, hemodynamic status with bleeding control).
In the pre-hospital phase, the maintenance of a patent airway, the control of external bleeding and shock treatment, the immobilization of the patient and the rapid transport to the nearest suitable hospital, preferably a Trauma Center, are of primary importance.

1) Adequate oxygenation and ventilation must be ensured in the patient with major trauma who requires airway management at the scene.

   The most effective interventions (strategies) for airway management in patients with pre-hospital trauma are:

- With trauma patients unable to ventilate and maintain open airways for adequate oxygenation, use intubation with rapid induction of anesthesia (RSI) as a definitive maneuver to secure the airways and ensure ventilation and oxygenation.
- If indicated, perform the RSI intubation as soon as possible and in any case within 45 minutes of calling the operations center, preferably on the scene
- If RSI intubation fails, when also a supraglottic device cannot be placed or in case of airways reflex absence, use basic maneuvers for airways management and/or specific devices(aspiration, oro or nasopharyngeal cannulae, bag valve/mask) until the tracheal tube or surgical airway can be positioned.
- If intubation fails, transport the patient to the nearest emergency room for intubation if it is not possible to guarantee patent airways with basic maneuvers or with supraglottic devices or if the estimated transport time to the trauma center is, in optimal conditions, greater than 45 minutes starting from the call to the operations center

2) The use of pneumatic or mechanical tourniquets is cost effective and improves outcomes in severe trauma patients with life-threatening limb hemorrhage.
   In severe trauma at-risk patients with bleeding from the limbs the use of the tourniquet, if immediately available, is favoured to direct compression. The tourniquet should be removed when effective surgical hemostasis is available, possibly within 120 minutes to prevent adverse events related to the permanence of the tourniquet.
   For external bleeding control in serious trauma at-risk patients, in which the use of the tourniquet is not possible due to their location (e.g. Junctional wounds), direct compression is recommended and the additional use of hemostatic dressings and wound packing is recommended if necessary.

3) In haemorragic shocked patients with suspected pelvic fracture or just in case of suspicion, the use of the circumferential external compressive devices (ECD or Pelvic Binder) in restraint mode is suggested as opposed to the non-positioning of the ECD. These kind of devices are cost-effective and are demonstrated to improve the outcomes in case of use in pre-hospital setting.

4) When it comes to patients with suspected hypertensive PNX, in the presence of hemodynamic instability and / or respiratory compromise, a pleural decompression maneuver is recommended. In the pre-hospital setting in ventilated patients with positive pressure and with suspected hypertensive PNX, in the presence of haemodynamic instability and / or respiratory compromise, open thoracostomy is preferable to needle decompression or chest drainage. The use of the needle in the anterior position for the execution of this maneuver is recommended only in the paediatric population. In a pre-hospital setting with non-ventilated positive pressure patients with suspected hypertensive PNX, in the presence of haemodynamic instability and / or respiratory compromise, needle decompression in the V intercostal space between the middle and posterior axillary is preferable in the first instance compared to more invasive maneuvers (open thoracostomy or chest drainage). In the case of open PNX without respiratory failure, the application of adhesive dressing on three sides or with a one-way valve is recommended. In the case of open PNX with respiratory failure, the application of an adhesive dressing on three sides or with a one-way valve and positive pressure ventilation is recommended in the absence of rapid resolution of the clinical picture.

5) The use of systemic haemostatic agents is clinically cost-effective for improving outcomes in patients with confirmed or suspected bleeding following major trauma in the pre-hospital setting.

6) For trauma patients with trauma and hemodynamic instability or shock and without evidence of head trauma, volume resuscitation is suggested according to a strategy of permissive hypotension (target systolic BP 70 - 90 mmHg) until definitive control of the bleeding. For patients with trauma and haemodynamic instability or shock and evidence of moderate to severe head injury, volume resuscitation according to a strategy of permissive hypotension is not recommended, but an infusion of fluids with a target of higher blood pressure (target systolic BP 100- 110 mmHg) is.

7) For a traumatized patient with haemorrhage it is recommended to use crystalloids in the pre-hospital setting. In the trauma patient with haemorrhage in the pre-hospital setting, whenever possible, consider the transfusion of blood components if available. To identify patients with critical haemorrhage resulting from trauma in the pre-hospital phase, we suggest the use of the Shock Index for the interpretation of clinical data and the ABC score in case of availability of extended-fast ultrasound, considering both cases the evolutionary trend of the indices. To identify patients with critical bleeding resulting from trauma after admission to hospital, the use of the TASH score is suggested.

8) For major trauma patients, temperature monitoring and the prevention as well as timely treatment of hypothermia are recommended.

9) With major trauma with bleeding, the use of TXA is recommended rather than non-use. The recommended setting for the first administration is the pre-hospital setting. However, if not performed in the pre-hospital phase, it is recommended to use it in the early stages of in-hospital treatment not exceeding 3 hours from the trauma for the first administration in the dosage of 1g to be infused in 10 to 15 minutes.
In case of brain injury only with GCS equal to or less than 12, the use of TXA is preferable to non-use. Also in this case the setting foreseen for the recommendation is the pre-hospital

one. However, if not performed in the pre-hospital phase, it is recommended to use it in the early stages of in-hospital treatment with the same indications as before.

5: Activation Sequence from Extra-Hospital Aid to Intra-Hospital Aid

The pre-hospital rescue team that intervenes on the traumatized patient assigns him to one of the severity classes marked by an alert code/LEVEL(Tab. 1):

Tabella 1: livelli di allertamento per trauma grave	
LIVELLO 1	traumi maggiori con ipotensione sulla scena o durante il trasporto e/o segni obiettivi di possibili emorragie interne o di ipoperfusione sistemica
LIVELLO 2	traumi maggiori emodinamicamente stabili o stabilizzati, con lesioni potenzialmente evolutive e con necessità di stabilizzazione secondaria chirurgica
LIVELLO 3	traumi maggiori potenzialmente evolutivi per dinamica, clinica o dati anamnestici, ma emodinamicamente e neurologicamente stabili

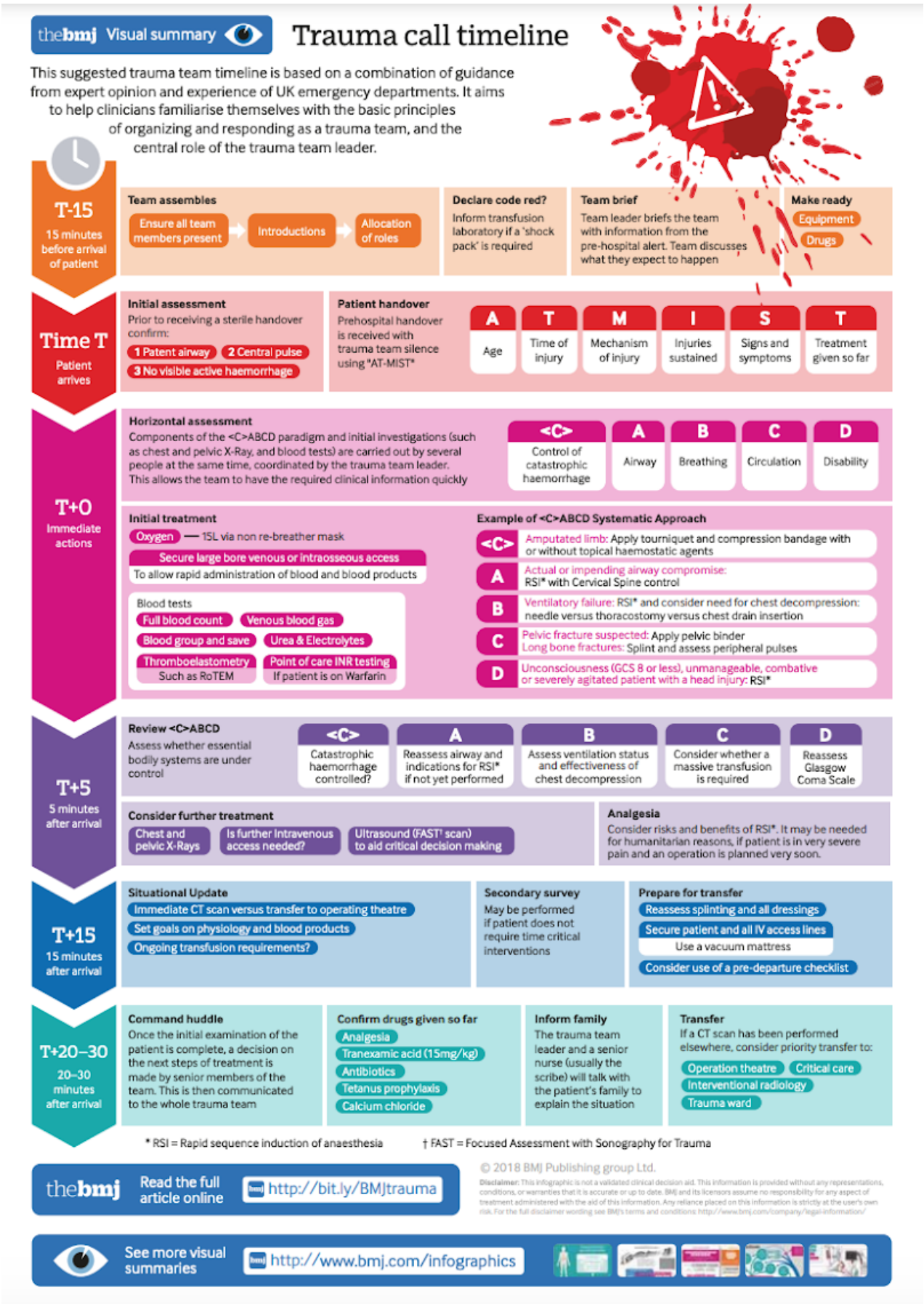
Tab. 1: Alert codes

Each level corresponds to specific alerting characteristics of the different components of the intrahospital Trauma Team. The alert procedure by levels must already take place in the pre-hospital phase by the health care manager of the EMS team.
In the Trauma protocol it should be foreseen that the rescue personnel transmit the data related to the accepting hospital, before the patient is transported.
The handover should be transmitted using the "AT-MIST" tool(fig. 3) to which the estimated time of arrival of the patient at the receiving hospital will be added.

Based on the classification received, the shift head nurse in the Trauma Bay will alert the triage area and the Emergency Room areas dedicated to the management of polytrauma and the related Emergency staff. Major trauma patients labeled as level I and II will be managed in the Trauma Bay while the level III traumas will be managed in the green area unless different and specific indications are provided by the MET or contingent Emergency Department issues.

The patient will access directly in the dedicated process area (ED Trauma Bay for major trauma level I and II, ED green area for level III polytrauma). In particular for level I and II traumas, it will be a responsibility of the nursing staff operating in the area dedicated to the management of polytrauma, to register the patient in the computer system.
Level III traumas, also in consideration of the contingent operational commitment in the emergency room, may eventually pass through triage where they will be recorded in the computer system by the triage nurses before being sent to a specific examination area.

It will become the responsibility of the EMS head to hand over the patient to the Trauma Leader and the Trauma Team. They would use the ATMIST tool and highlight any changes that occurred during the transport period.

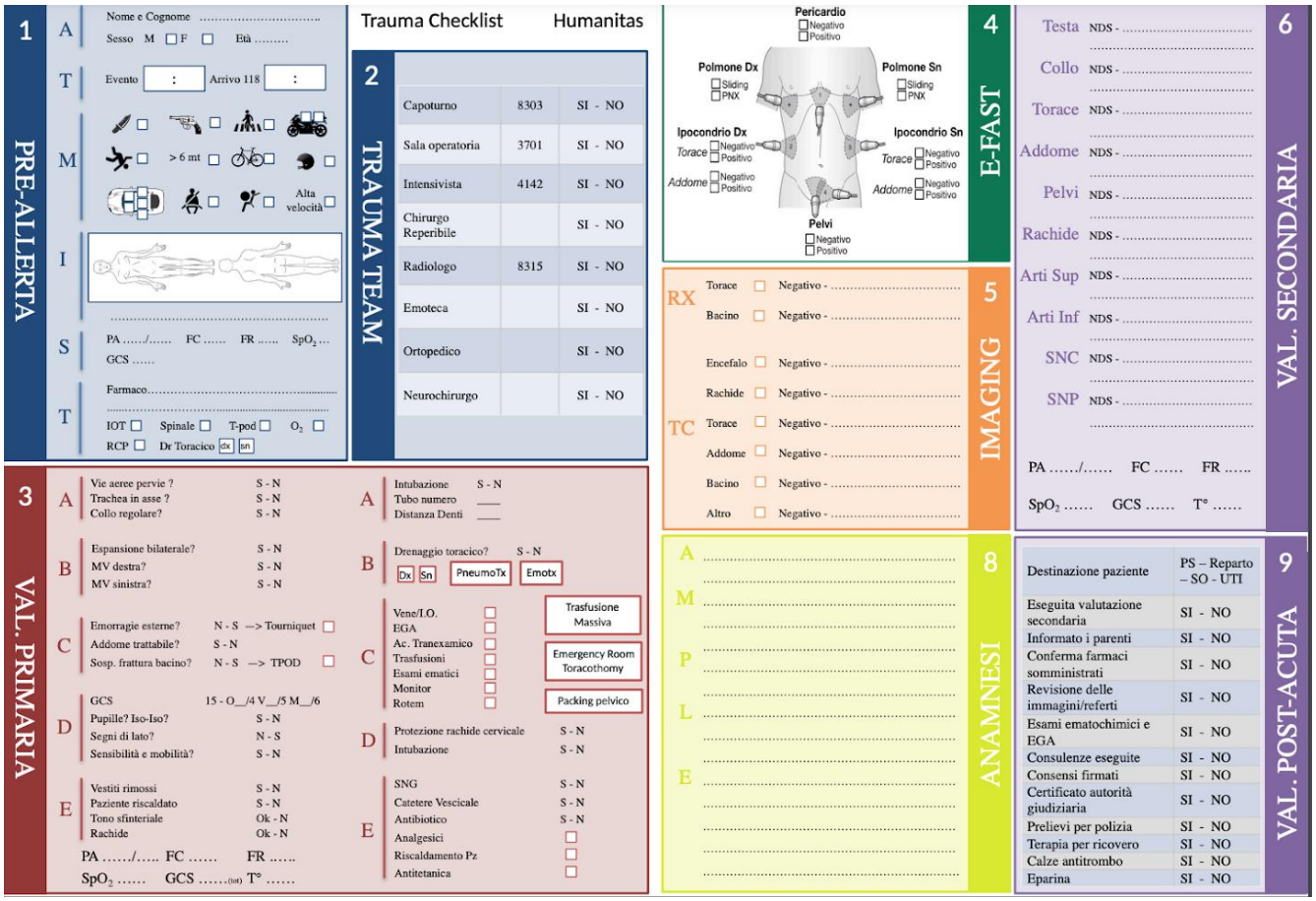


Tab 2: WHO Trauma Call Timeline

A.T.M.I.S.T. Handover Tool

AGE	Age and sex of casualty (demographic).	
TIME	Estimated time of arrival and the time of incident.	
M.O.I.	Mechanism of injury. This should include: • The gross mechanism of injury (e.g. motor vehicle crash or stab wound to the chest) and, • Details of other factors known to be associated with major injuries e.g. entrapment, vehicle rollover, occupant ejected from vehicle.	
Injuries	Seen or suspected.	
Signs	• Vital signs including heart rate, blood pressure, respiratory rate, oxygen saturation and Glasgow Coma Score. • An indication as to whether the physiological state of the patient has improved or deteriorated since first seen.	
Treatment	Treatment given.	

Tab 3: AT-MIST model handover



Tab 4: Trauma management checklist

6: Hospital Preparation for Trauma Arrival:

6.1 The basic aspects of hospital preparation are the following:

- availability of a warmed shock room for patients;
- rapid activation of the Trauma Team
- rapid availability of adequate and verified equipment for airway management (laryngoscopes, ET tubes, etc.);
- rapid availability of adequate and verified equipment for pneumotorax/haemothorax management
- rapid availability of adequate and verified equipment for limb external bleeding(gauzes, tourniquet, etc.);
- rapid availability of adequate and verified equipment for pelvic stabilization bleeding(pelvic binder, etc.);
- availability of warmed crystalloids for IV infusion and patient monitoring devices;
- a protocol for the activation of massive transfusion
- a protocol for the activation of additional medical personnel and for the prompt intervention of laboratory and radiology technicians;
- operative modalities for the transfer in another Trauma Centre

6.2 in-hospitalTrauma Team:

The Trauma Team, in its basic composition - for adult patients, includes the emergency doctor, the intensivist, the trauma or general surgeon, the radiologist, the x-ray technician, the nurses and the care technician.

It is the responsibility of the organization to provide for the shifts of the TT components in order to ensure the participation in the TT of professionals with adequate experience. According to the clinical evaluations that emerged following the first evaluation of the patient or inferable from the dynamics of the trauma or from other elements communicated by 118, this composition can be extended to other specialized professionals for specific needs.

The Trauma Team is coordinated by the team's lead physician. The team leader has the role of coordinating the overall management of the patient, even more in the period of greatest instability ("golden hour"), in order to optimize the work of the TT.

The Team Leader coordinates the trauma team on the basis of protocols defined and approved by the Management in order to:

- define the diagnostic-therapeutic priorities involving any other specialists
- check the general condition of the patient according to the principle of continuous re-evaluation - evaluate the results of the investigations diagnostic
- managing infusion and transfusion therapy
- carrying out and monitoring the mobilization and immobilization maneuvers of the patient
- managing relations with the patient's family members.

After the initial phase of First Aid, in particular at the end of the secondary survey, or in any case when the lesion balance and the level of organ dysfunction are clear, the patient is taken care of by the relevant specialist reference figure.

The effectiveness and efficiency of the Trauma Team (TT) is linked to the professional preparation of the individual components but the final result in terms of performance of the TT requires

teamwork that can be reached with specific training of all the components, therefore a adequate training course for the homogenization and maintenance of professional skills through continuous training.
The hospital Trauma Team is made up of nurses and radiology technicians in the hospitals of the Center for Trauma of High Specialization (CTS) as well as doctors from the disciplines of First Aid, Anesthesia-Intensive Care, Surgery and Radiology.
All Doctors belonging to the Trauma Team must have followed a certified training process according to the ATLS or ETC methodology. The boards will have to analyse the training needs of the medical and nursing staff involved in the activities of the Trauma Team. Moreover, they will have to proceed to the establishment of training moments referring to both certified courses (ATLS and / or ETC and / or PTC) in the first phase and activate courses ad-hoc based on the indications of the Strategic Committee of the Network (this applies to Italian system). Each training process started must in any case see its integration with training sessions structured with high fidelity simulation. Refreshing must also be planned for operators already certified in ATLS or in ETC.

7. Emergency Room Rescue and Primary Survey

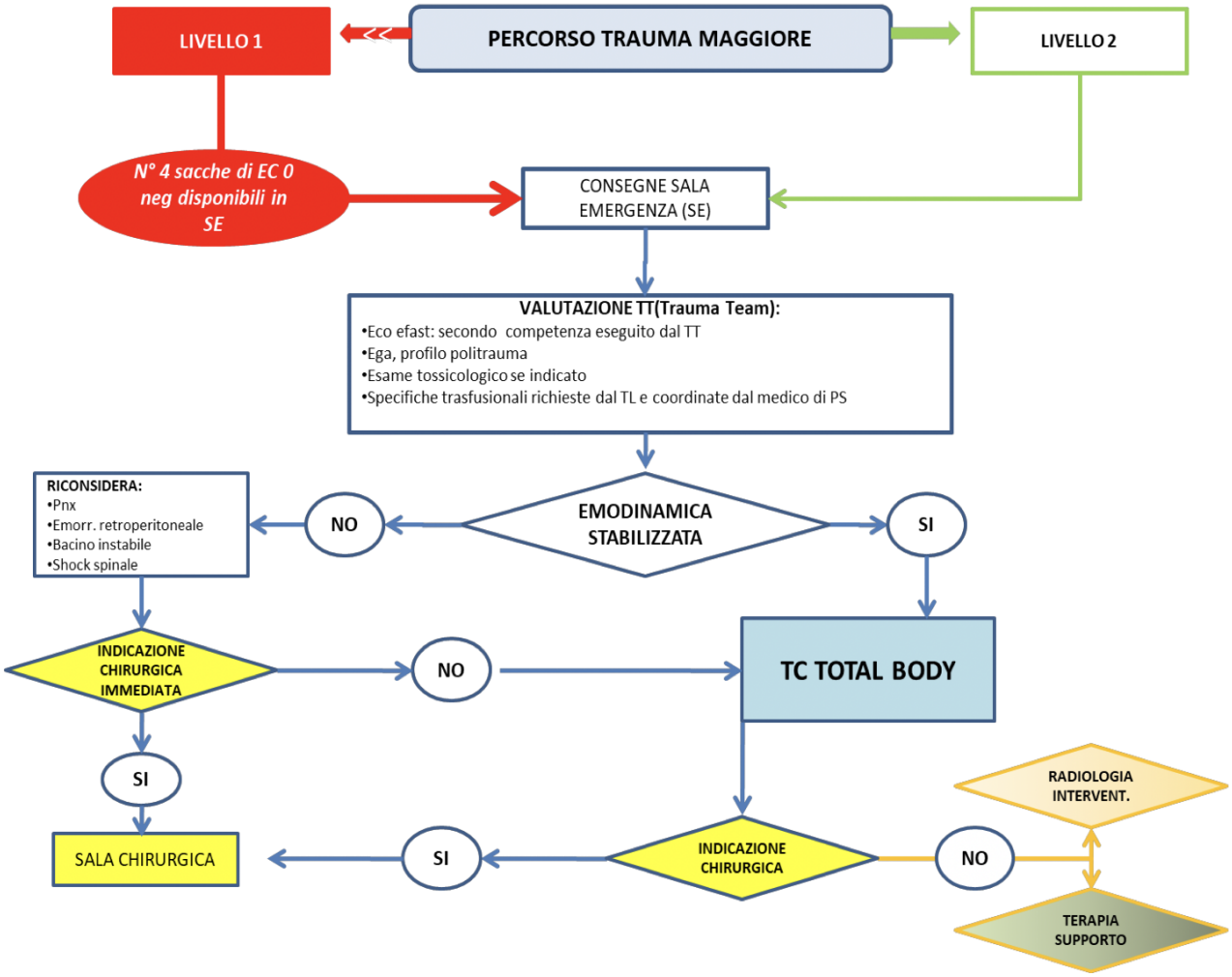
Upon arrival of the patient in the emergency room, following the handovers between the extra-hospital team and the trauma team, the priority is given by the primary evaluation following the ATLS protocol and then the ABCDE order (table 5). It aims at the recognition and immediate treatment of those potentially rapidly evolving critical conditions (e.g. airway obstruction, tension pneumothorax, massive hemothorax, hemodynamically significant hemopericardium, external bleeding from compressible foci or pelvic instability / displaced fractures or other situations that could not be identified or treated in the out-of-hospital phase or occurred later).
It will also be the responsibility of the clinicians involved in the primary assessment to activate or suspend the massive transfusion protocol.

A	B	C	D	E
Airway (valutazione vie aeree)	**Breathing** (valutazione respiro)	**Circulation** (valutazione circolo)	**Disability** (valutazione neurologica)	**Exposure** (esposizione del paziente)

Tab 5: ABCDE sequence for the detection of immediately dangerous for life situations

7.1 Major Trauma Pathway for level of activation

Di seguito la flowchart riguardante il percorso dei pazienti traumatizzati con livello di attivazione 1 e 2(tab. 6) - Italian standard procedure



Tab 6: Code 1 and 2 Trauma pathway

7.2 Diagnostic pathway for level of activation 1 and 2

Tasks of the medical team:

- Complete handover to all the Trauma Team
- Primary survey including the ABCDE Sequence
-E- FAST abdomen-thorax (according to competence it is performed by the PS doctor, the resuscitator or the general surgeon)
- Chest x-ray and pelvis x-ray in an emergency BOX
- MTP activation if needed

- Stabilization of the patient or identification of a situation that need an immediate surgical approach

Tasks of Nursing Team:

- Execution of blood chemistry tests according to the Polytrauma Panel,
- Positioning of the bladder catheter and the SNG (except contraindications)
- Blood Group Determination (to be sent as soon as possible with nominal identification to the transfusion centre)
- Arterial blood gas analysis
- Toxicological blood and urinary tests according to clinical needs and / or according to a specific medical legal request by the traffic police bodies (see specific protocol, in particular for cases of refusal expressed by the patient to carry out investigations for medical legal purposes or in case of unconscious patient).

Once the patient is stabilized, the TT completes the diagnostic investigations according to following priority:

a) "Total body" CT: cranial, total spine and thoraco-abdominal CT, pelvis, with contrast medium b) radiographs of the limbs according to orthopaedic advice (only in the patient without surgical indications after performing TCTB).

c) specialist consultancy that may be necessary.

The neck collar, the immobilization and maintenance of the spine in axis during each movement must be ensured up to the exclusion of spine injuries. The spinal axis must be removed as soon as possible to avoid pressure sores

NB: With evidence of pelvic fractures or retroperitoneal hematomas or evident trauma of the pelvis on the CT scan, assess the need for:

- place pelvic binder where indicated if not already positioned
- consult interventional radiologist for possible angiography and embolization, if available
- consider with the general surgeon for performing an extraperitoneal packing
- consult an orthopaedic surgeon for emergency stabilization

7.3 Destination of patients labelled as Code 1

The patient, according to clinical evaluation and after diagnostic completion:

1. is admitted directly to the ICU
2. Access, according to specific polidisciplinary indications, directly to the operating room

7.4 Destination of patients labelled as Code 2

The patient, according to clinical evaluation and after diagnostic completion, can:

1. be admitted to the ICU after evaluation of the clinical picture by the colleague anaesthetist / resuscitator if so far not directly involved in the management of the case (patient taken directly by the colleague anaesthetist / intensivist in ICU if performed OT intubation, at the request of the MET and if agreed with the PS doctor after joint evaluation). Patients with level 2 major trauma who arrive intubated in SE or who require OT intubation undergoing investigations are still hospitalized in ICU,
2. go directly to the operating room,
3. in case of early stability, in the absence of urgent surgical indication and / or due to presumed non-developmental pathology, the TT can agree to continue observation in OBI or arrange a hospitalization area other than ICU and in particular in the semi-intensive area.

The procedural flowcharts related to the various pathological situations will be attached below.

8: Cattinara University Hospital Facilities and accessibilities:

The Trieste Hub Centre is equipped with the following standards:
- emergency room with on-site possibility of stabilization and radiological and ultrasound examinations
- CT, interventional angiography in the immediate vicinity
- 24-hour operating rooms
- 24-hour activation of operating theatre dedicated to emergency (so-called Damage Control Surgery)
- intensive care dedicated to the management of major trauma
- Emergency Medicine
- General and Emergency Surgery
- Anaesthesia
- ICU
- Orthopaedics
- Neurosurgery
- Radiology with interventional possibility
- Laboratory and transfusion centre

On site, there are also specialties such as cardiac surgery, maxillofacial surgery, plastic surgery, urology, neurology and electrophysiology, vascular surgery, thoracic surgery, spinal surgery, digestive endoscopy and bronchoscopy, cardiology, nephrology and dialysis, diabetology.
The functions of paediatrics, paediatric surgery and obstetric-gynaecological surgery are envisaged (also with inter-company agreements).

Table 7 shows Cattinara Hospital Capacity

Emergency Room *(n° beds)*	15
Sub-intensive care unit *(n° beds)*	24
Intensive Care Unit *(n° beds)*	20
General Ward *(n° beds)*	550
Operating Room *(n° of OR)*	14
Intensive Cardiac Care Unit *(n°)*	10
Intensive Cardiosurgery Care Unit *(n°)*	10
Stroke Unit *(n°)*	8

TC Scan *(n° of sections available)*	4
Rx scan *(n° of sections available)*	12

Tab 7

Focusing on ambulances, ASUGI has ALS and BLS ambulances that work for regional EMS service and cannot be immediately available to support transport from Slovenia to Italy. ASUGI has 12 BLS ambulance and 1 ALS ambulance during daytime that can be used to transfer patients. BLS ambulance has not nurse on board instead of ALS type (see Table 8)

ALS Ambulances *(n°)*	5 (day shift) 3 (night shift)
BLS Ambulances *(n°)*	3 (day shift) 3 (night shift)
TRANSPORT Ambulances *(n°)*	12 BLS (day shift) 1 ALS (day shift) 2 BLS (night shift) 1 ALS (on call on nighttime)

Tab 8

As for the MCI protocol, the only area of intervention for NEX AID protocol will be the Slovenian side of the cross-border area, the Obalno - kraška region to support Izola General Hospital with the transfer of MCI and NON MCI patients.
Due to the impossibility of involving Slovenian EMS coordination system in this cross border protocol it will be impossible to transfer patient directly from MCI event site to ASUGI hospitals, so both partners agree to transfer patients directly from Izola General Hospital.

9: Activation of NEX AID Polytrauma Protocol

In case of a Major Traumatic event on Slovenian border in the Obalno - kraška region, the request for activation of Polytrauma NEX AID protocol will be sent from Izola General Hospital by phone call or radio call to ASUGI Farneto dispatch centre (Table 9). The purpose of the first call is that the Cattinara Hospital Emergency department will check the availability to accept the traumatized patient, which will be carried out by the Italian dispatch centre.
In case of acceptance, a complete ATMIST assessment must be sent from the prehospital team to the Emergency department.
For a detailed description of communication modality, see the NEX AID communication protocol.

PHONE NUMBER	0039 0403995094
RADIO	NEX AID Radio Channel
EMERGENCY DEPT.	0039 0403994567

Table 9: communication modality for activation of NEX AID MCI Protocol

9.1: Patients

The following categories of patients could be transfer to ASUGI hospitals:

1. **Unstable Polytrauma patients** who need transfer to Cattinara trauma centre for high level of care not deliverable in Izola General Hospital (level 1 -2 trauma activation);
2. **Stable or stabilized Polytrauma patient who need a time-dependent treatment:** in order to relive pressure from Izola General Hospital that cannot directly manage(level 3 trauma activation):
   - neurosurgery patients;
   - Burned patient;
   - Trauma patients requiring interventional radiology or angiographic procedures;
   - Trauma patients requiring ECMO;
   - Trauma Patients requiring definitive treatment not available at Izola General Hospital.

9.2: Predetermined response packages

Based on the communication from the prehospital team on the scene and the activation of the protocol, a pre-determined checklist for ASUGI are determined as follows (Table 4)

9.3: ASUGI available resources communication

After activation, ASUGI ER will communicate to prehospital team of Izola General Hospital the resources available at the time and the possibility of accepting the traumatized patient.
In this context available ICU beds, staffed OR, free angiosuite will be declared.

9.4: Patient Transfer

For patient transfer from Izola General Hospital to ASUGI Hospitals the following vehicles will be used:

1. Slovenian ambulances
2. ASUGI ambulances

9.5 ASUGI Hospital – Information for arrival

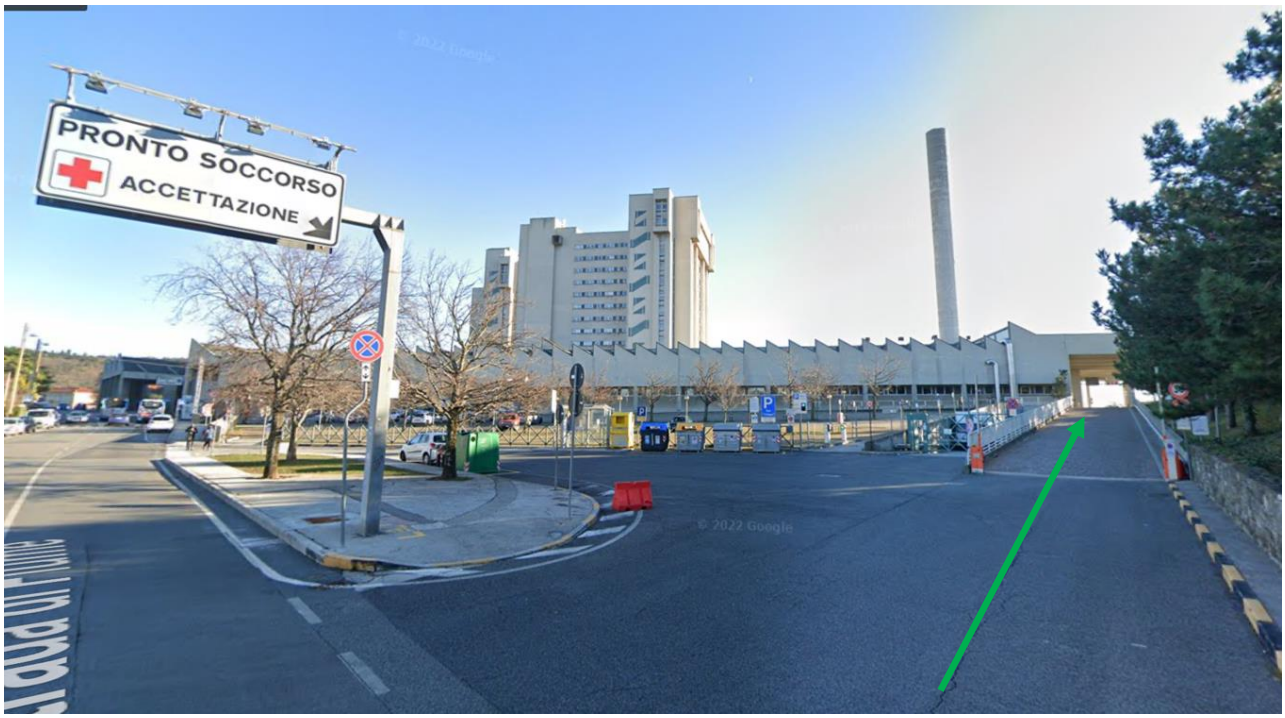
For information on how to reach Cattinara Hospital see Table 10. GPS and Google Maps link refers to Emergency Room location with access for ambulances.

Address	Strada di Fiume 447 34149, Trieste

	ITALY
GPS Coordinates	45°38'00.5"N 13°49'33.4"E
Google map link	https://goo.gl/maps/8DzDLvJCtaXPtNdH8

Table 10: Cattinara Hospital

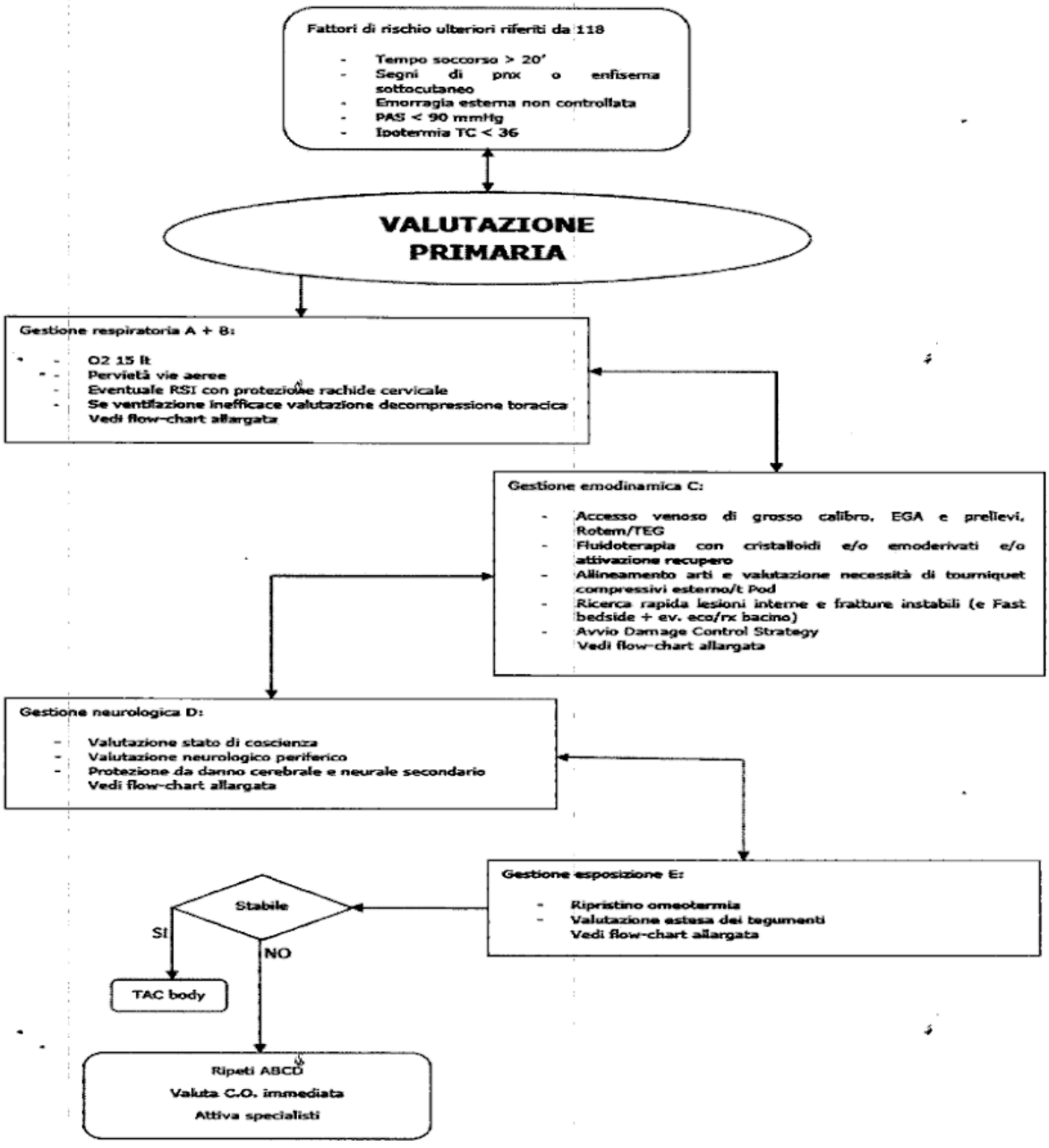
To reach the Emergency Room, ambulances on Strada di Fiume road must take a turn and go on a ramp that ends in Emergency Room triage area. On Strada di Fiume road there is a road sign **"PRONTO SOCCORSO ACCETTAZIONE "** that indicates the entrance of the ramp to ER (Image 1).



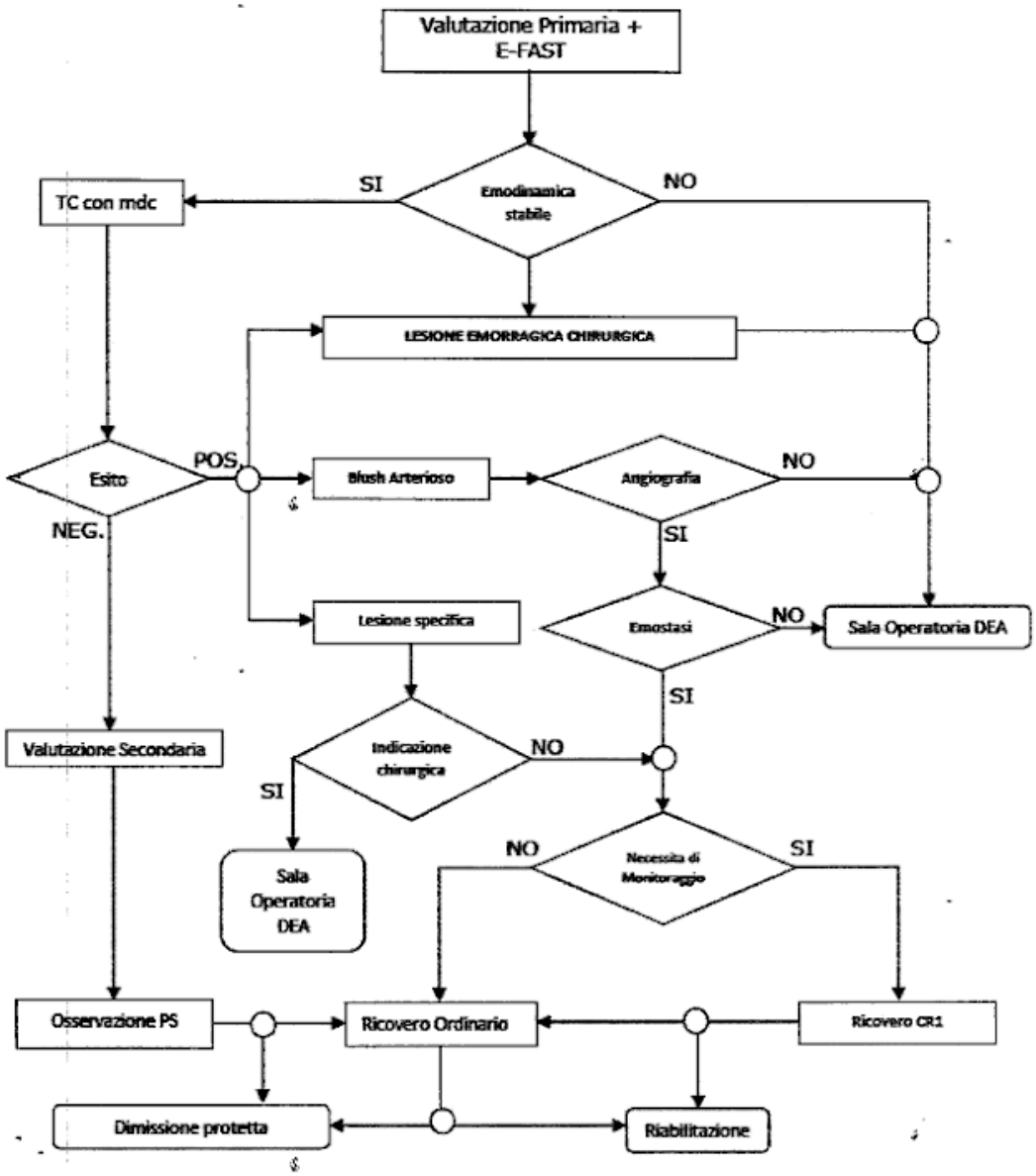

Bar Buffet Da
Alex Trieste
Crai
La Caffetteria Centrale
Villa Pompeiana
Strada di Fiume
Via dei Castelliere
Parcheggio Ospedale
di Cattinara
Parcheggio Cattinara
Strada di Fiume
Asilo Comunal
Bosco Magic
Cattinara Parcheggio
Ospedale di Cattinara
Pronto Soccorso
Ospedale di Cattinara
Aula Magna Rita
Levi Montalcini
Chop
Polo Cardiologico
Biblioteca Centrale
di Medicina

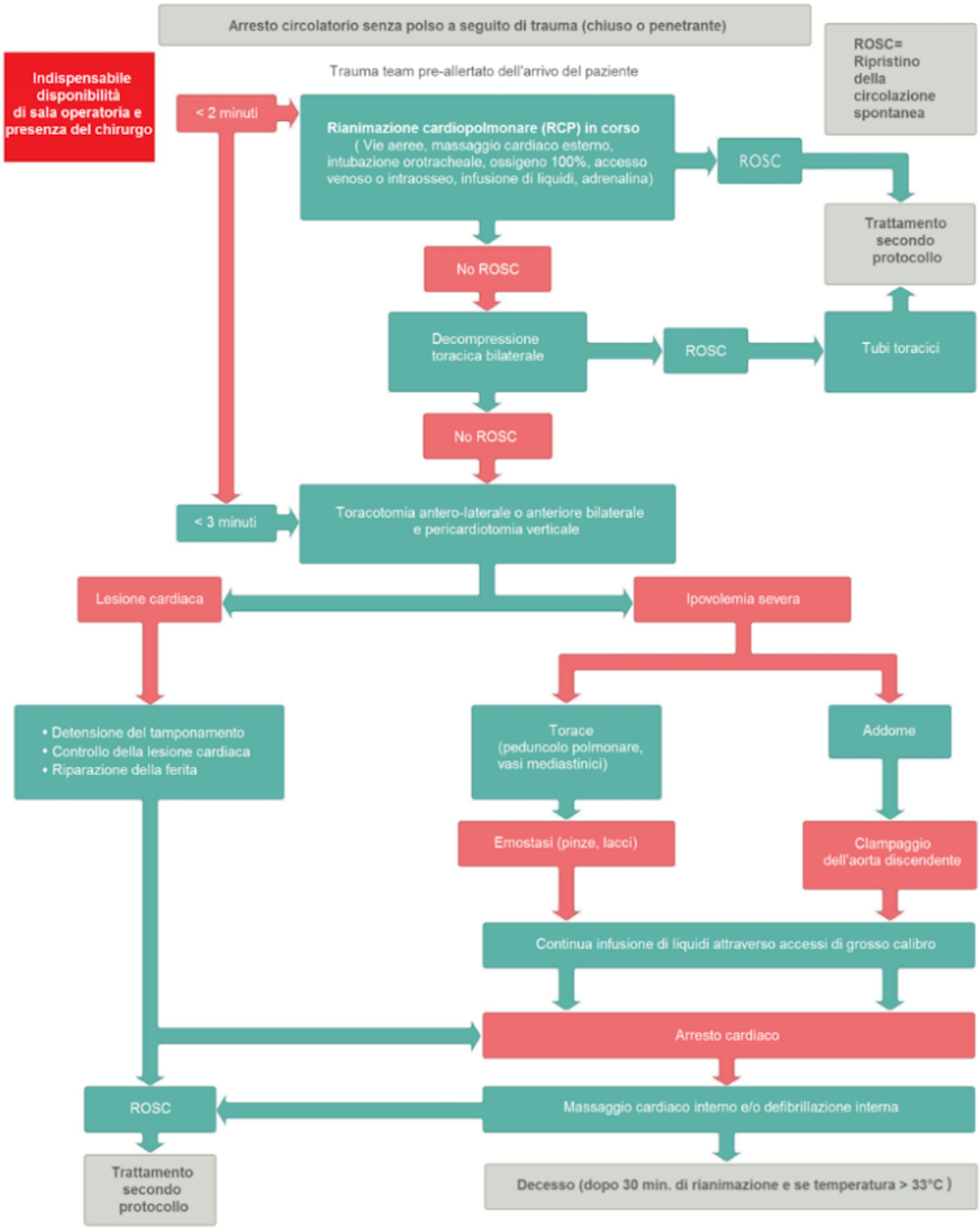
11. Appendix: Specific pathways

6.4 Azioni Pronto Soccorso valutazione primaria



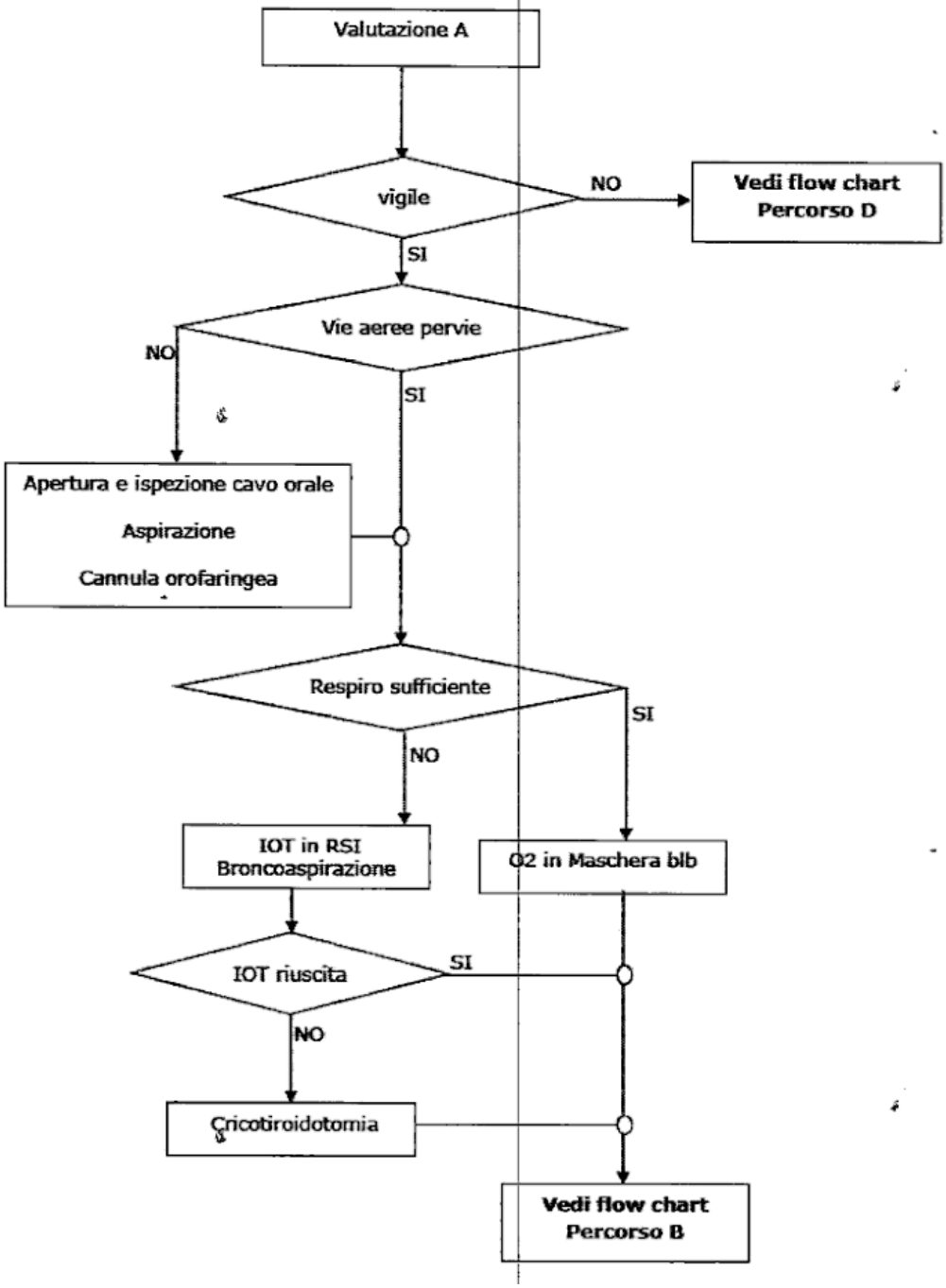
6.3 Percorso Intraospedaliero Trauma Maggiore



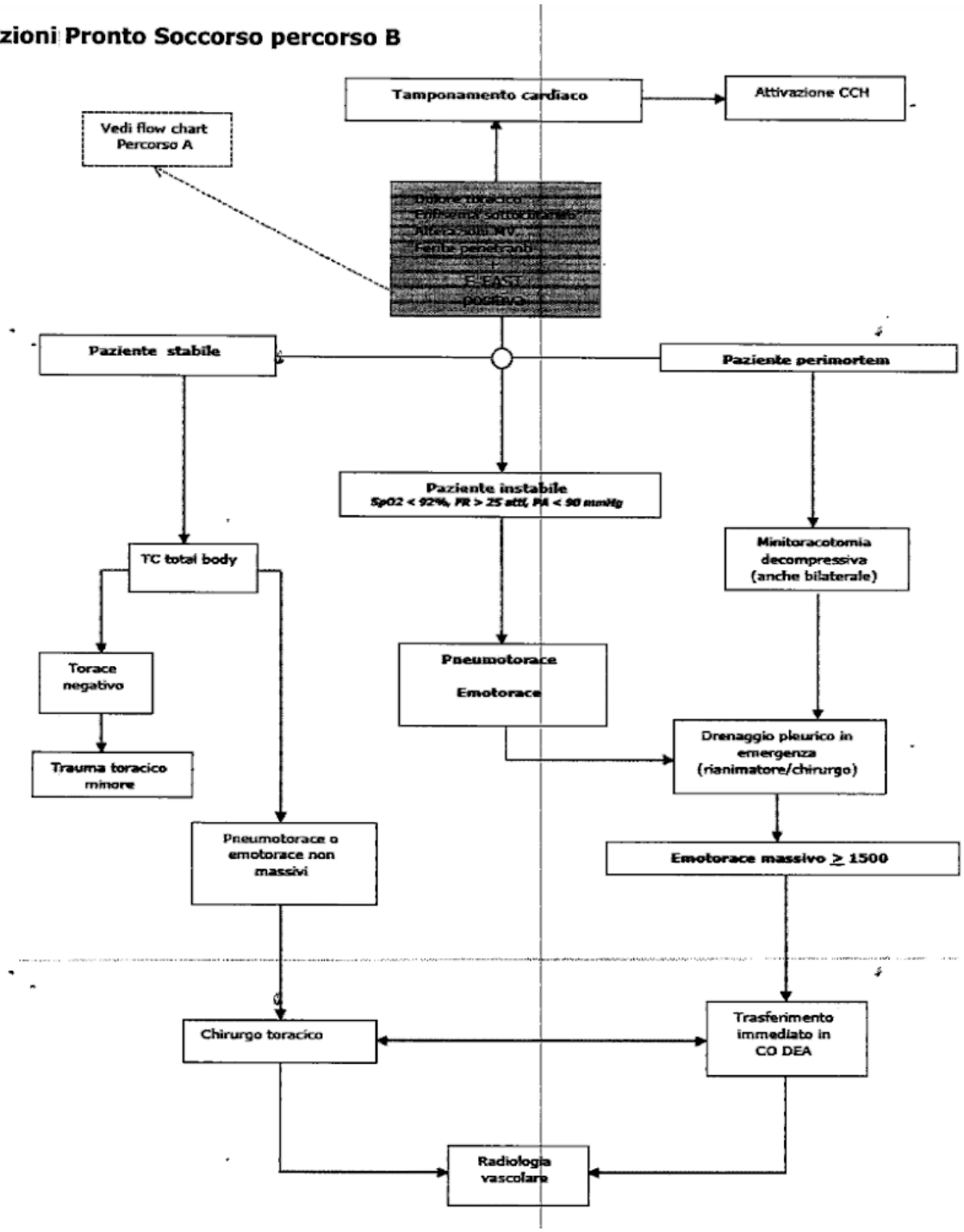


■ **FIGURA 4-7 Algoritmo per il trattamento dell'arresto cardio-circolatorio traumatico.** MCE = massaggio cardiaco esterno; IOT = intubazione orotracheale; AEV = accesso endovenoso; AIO = accesso intraosseo.

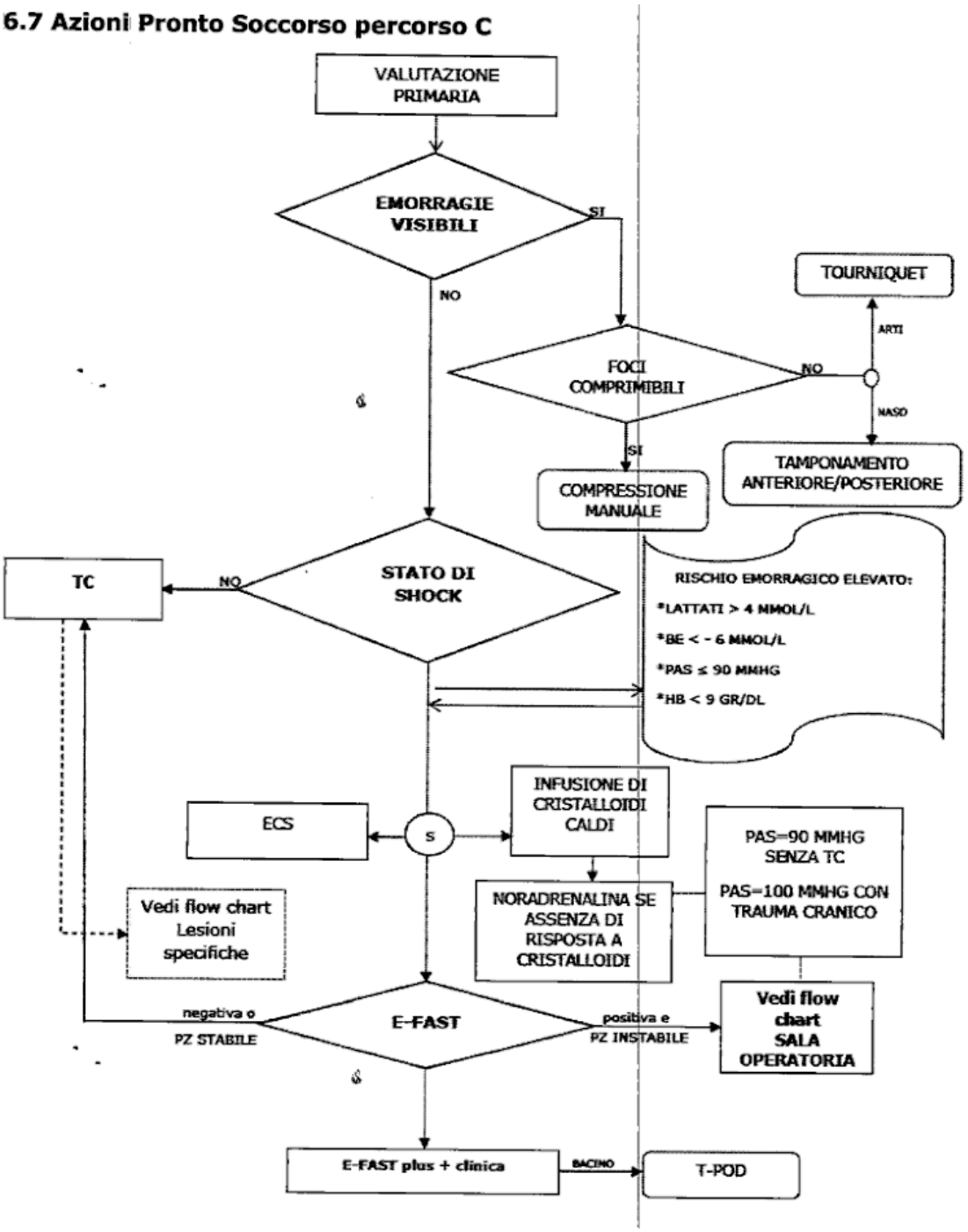
6.5 Azioni Pronto Soccorso percorso A



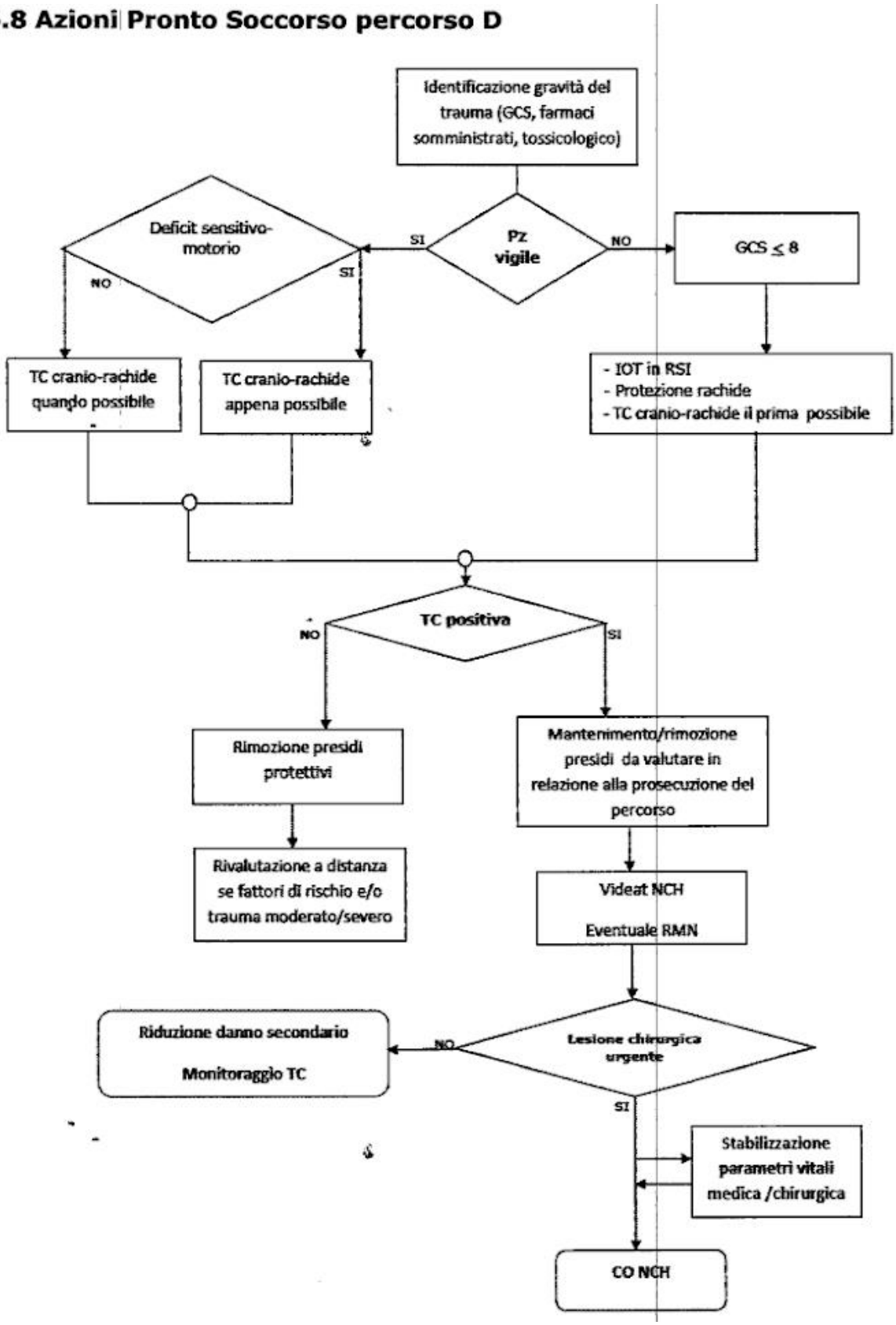
6.6 Azioni Pronto Soccorso percorso B



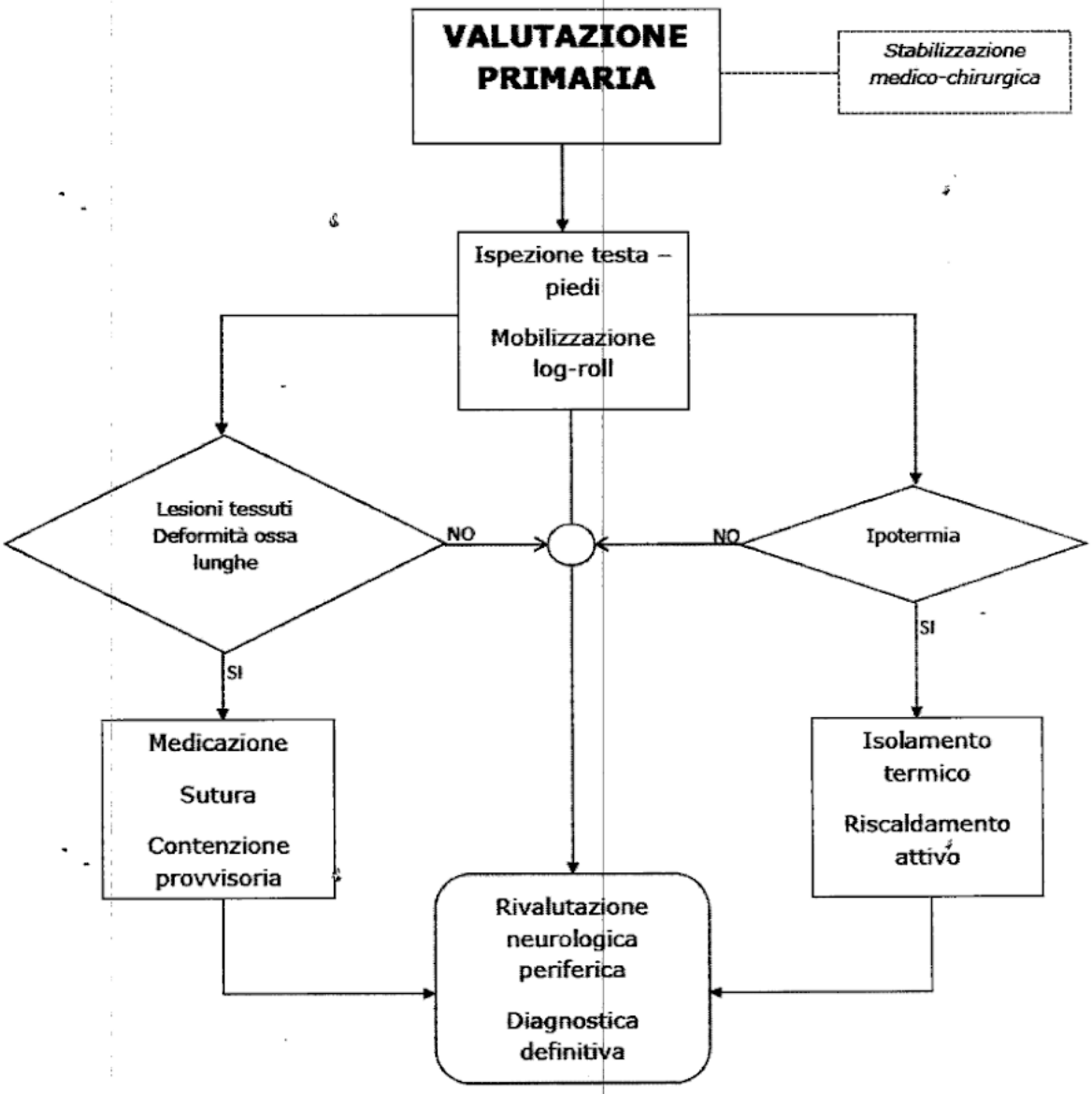
6.7 Azioni Pronto Soccorso percorso C



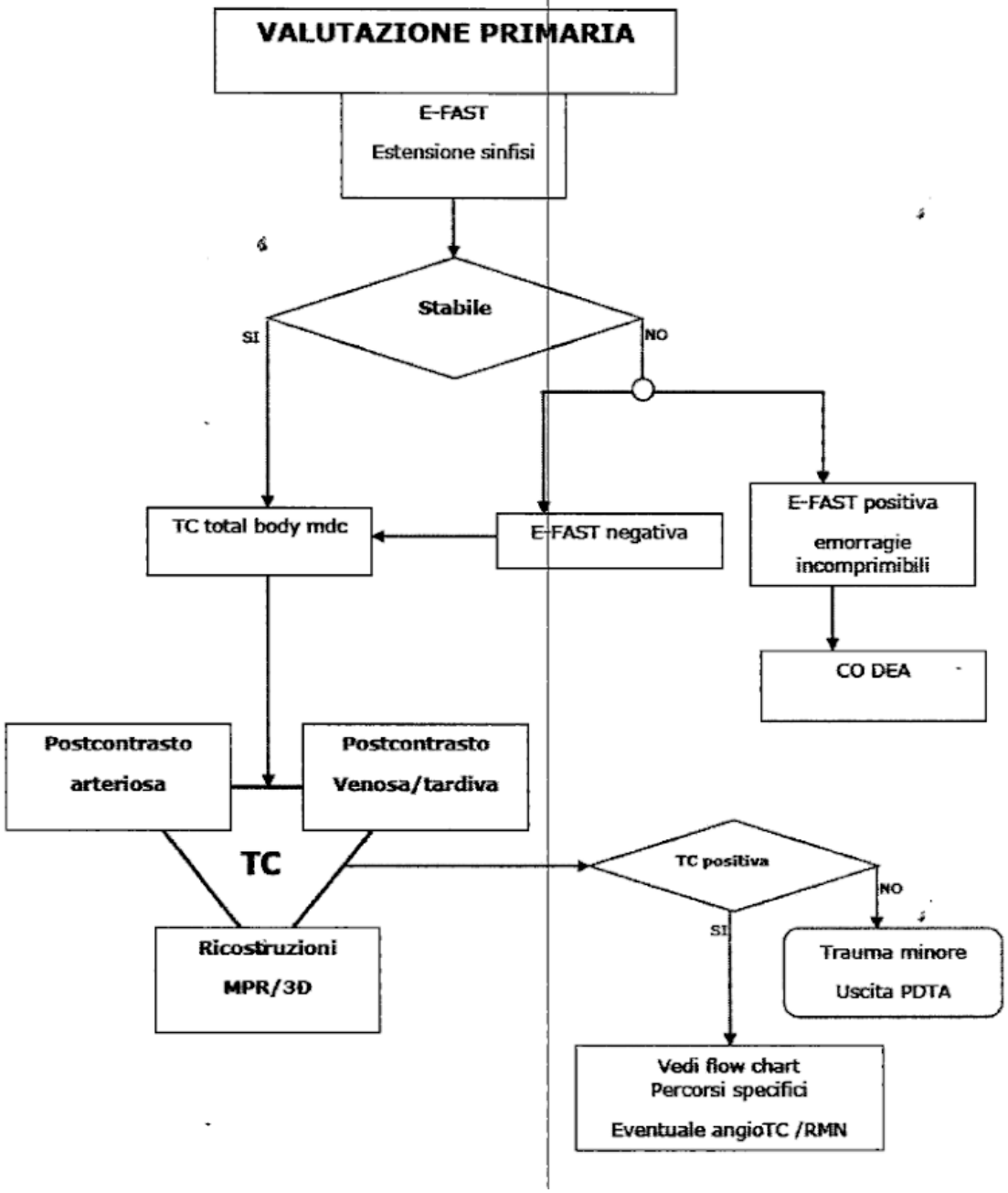
6.8 Azioni Pronto Soccorso percorso D



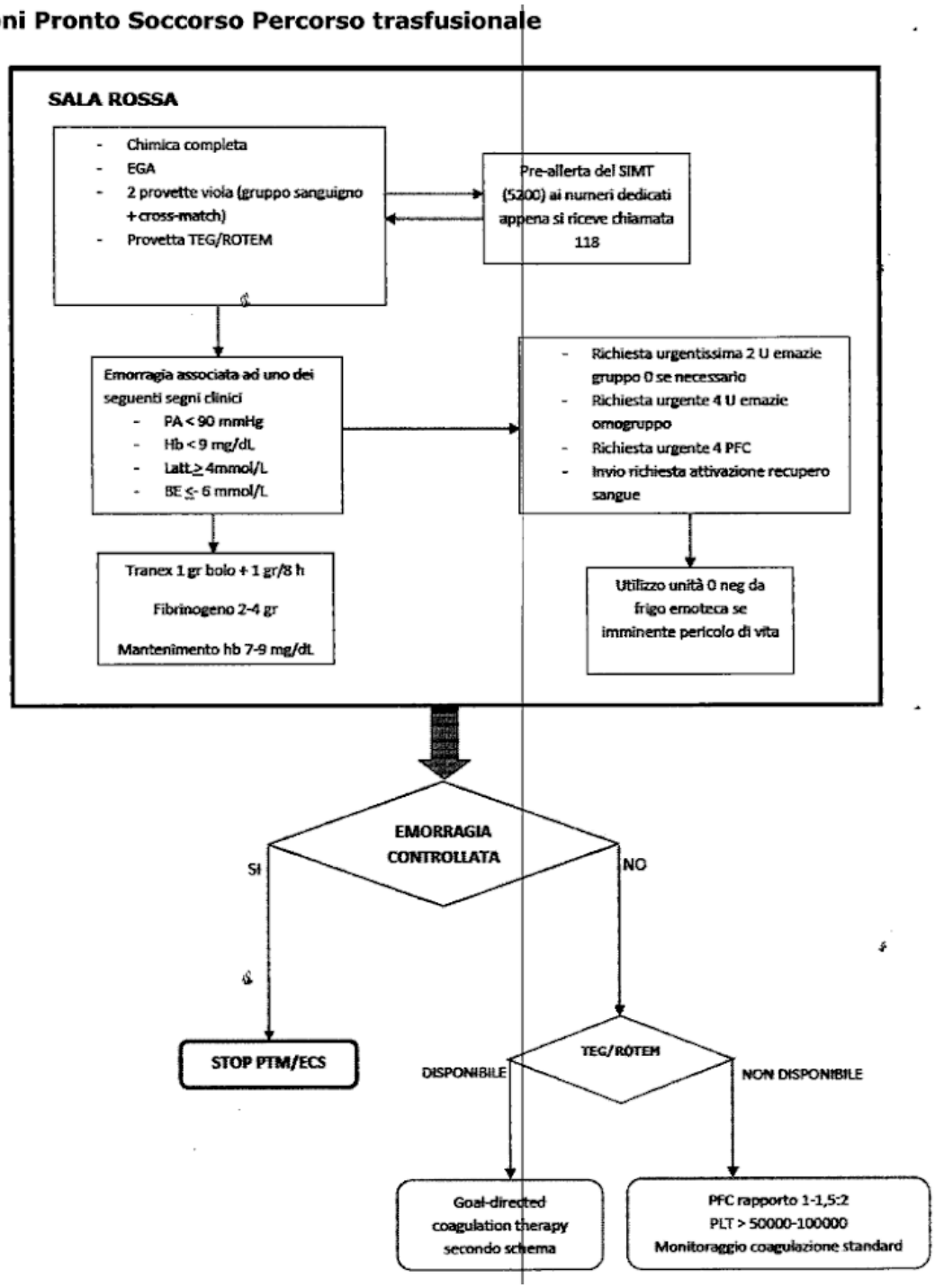
6.9 Azioni Pronto Soccorso percorso E



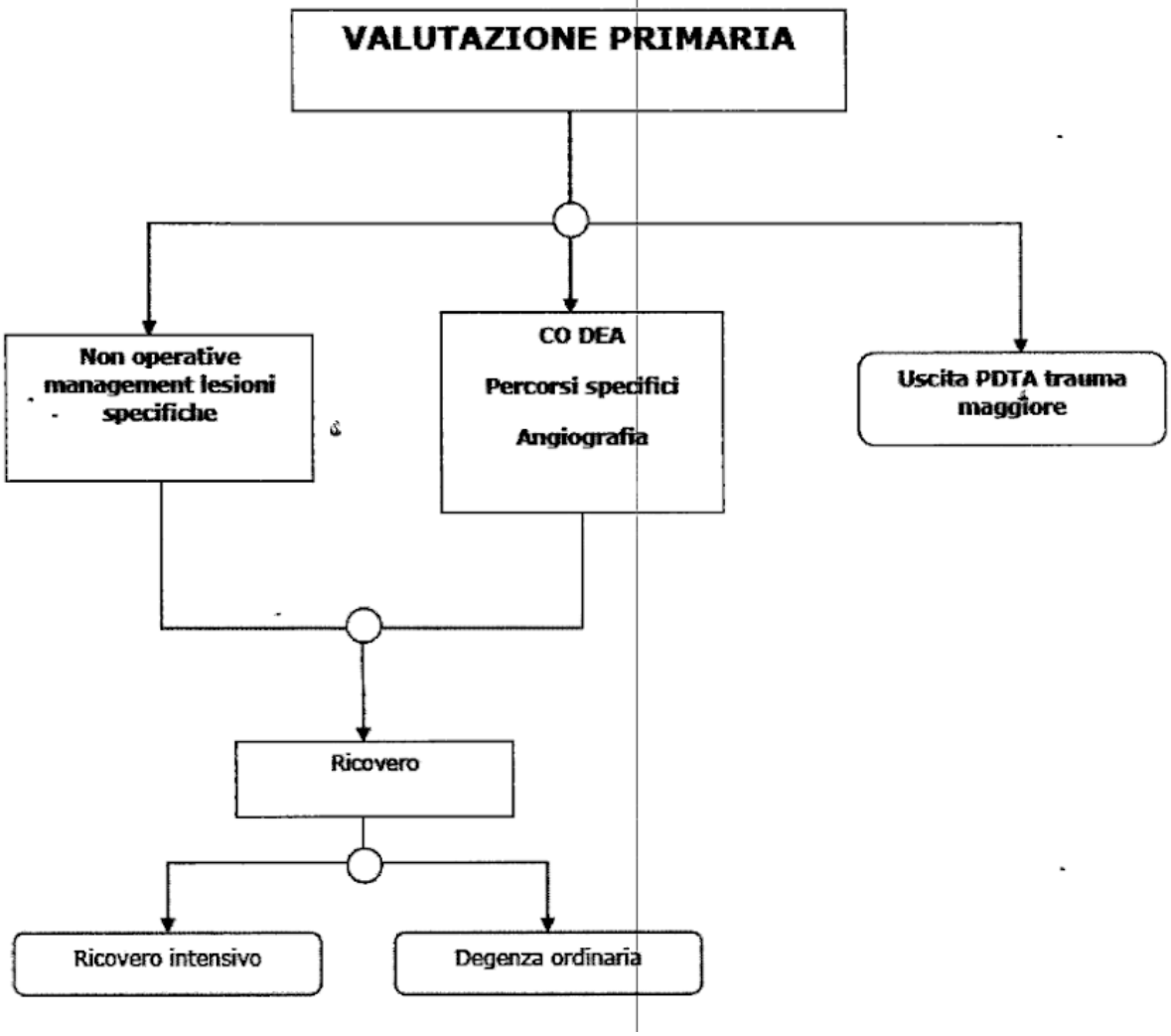
6.10 Azioni Pronto Soccorso percorso radiologico



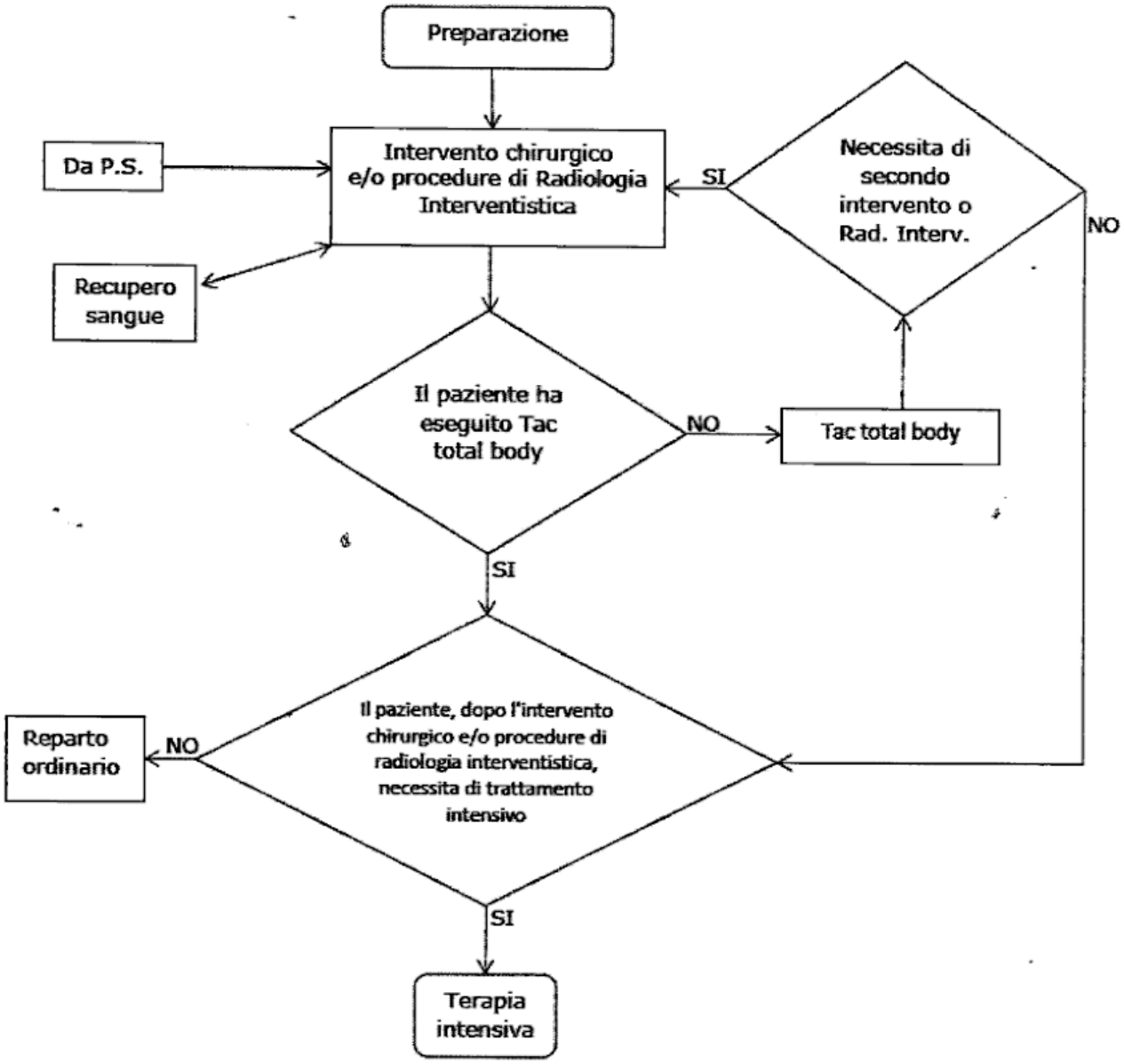
6.11 Azioni Pronto Soccorso Percorso trasfusionale



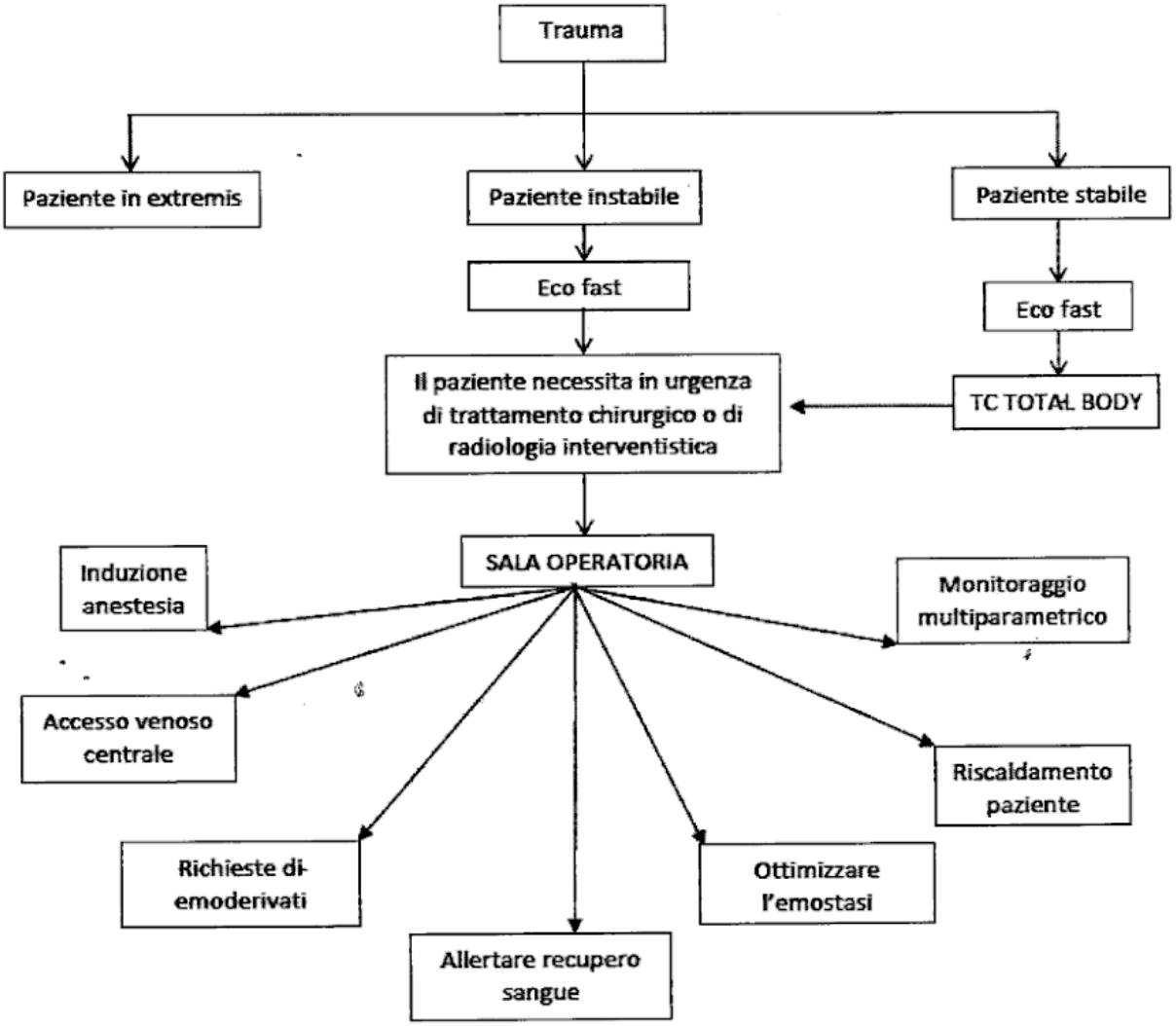
6.12 Azioni Percorso uscita Pronto Soccorso



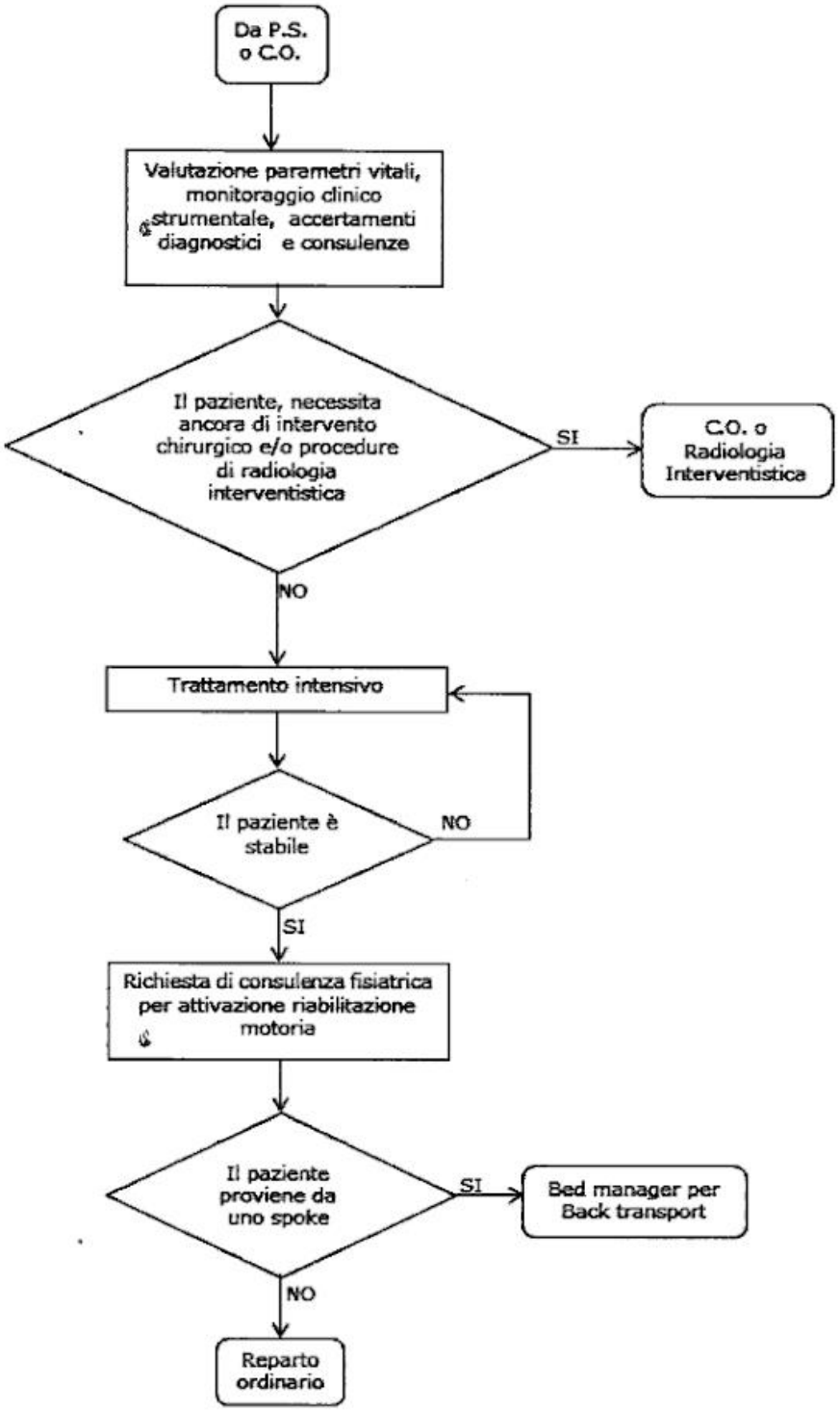
6.13 Percorso Sala Operatoria



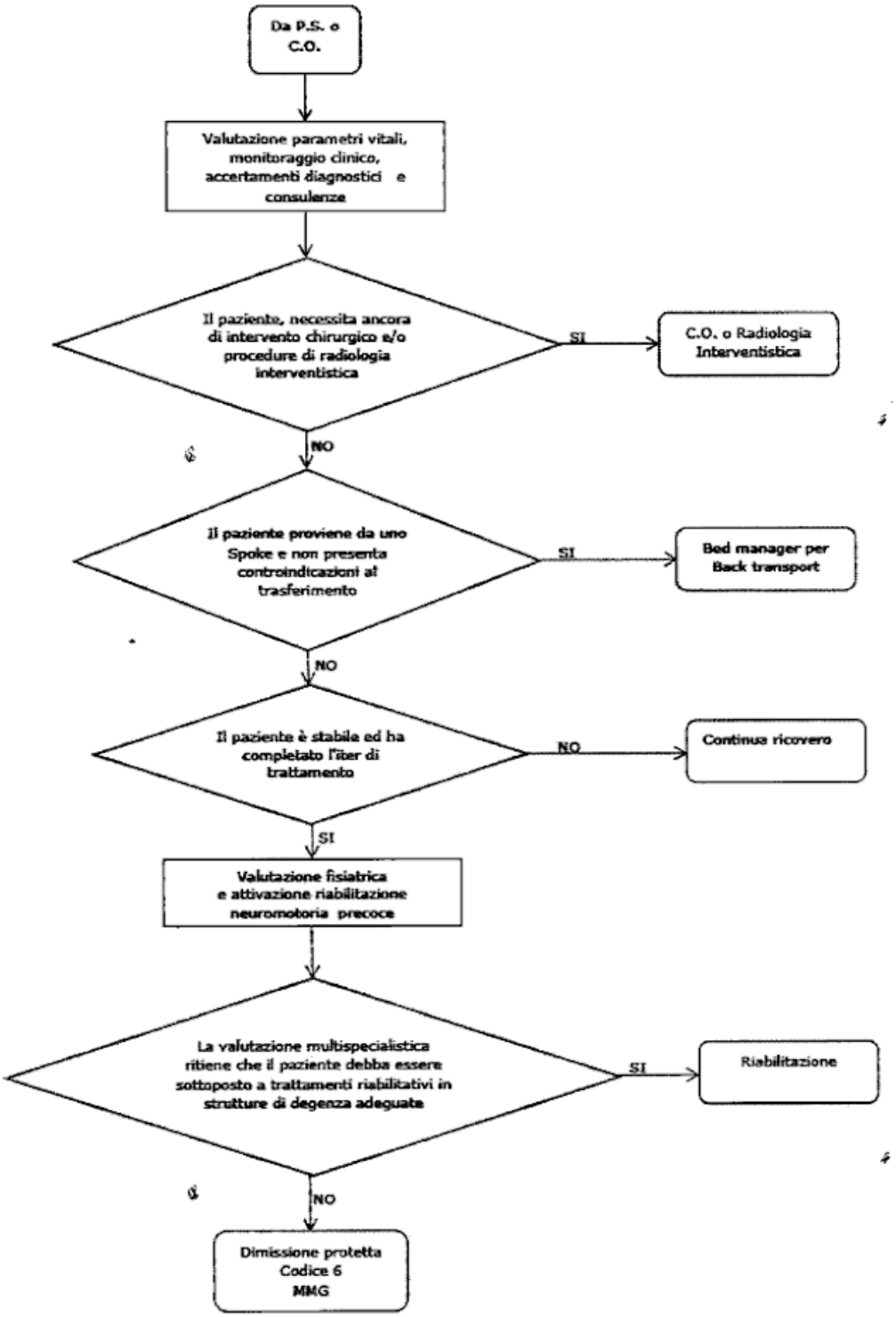
6.14 Azioni Sala Operatoria



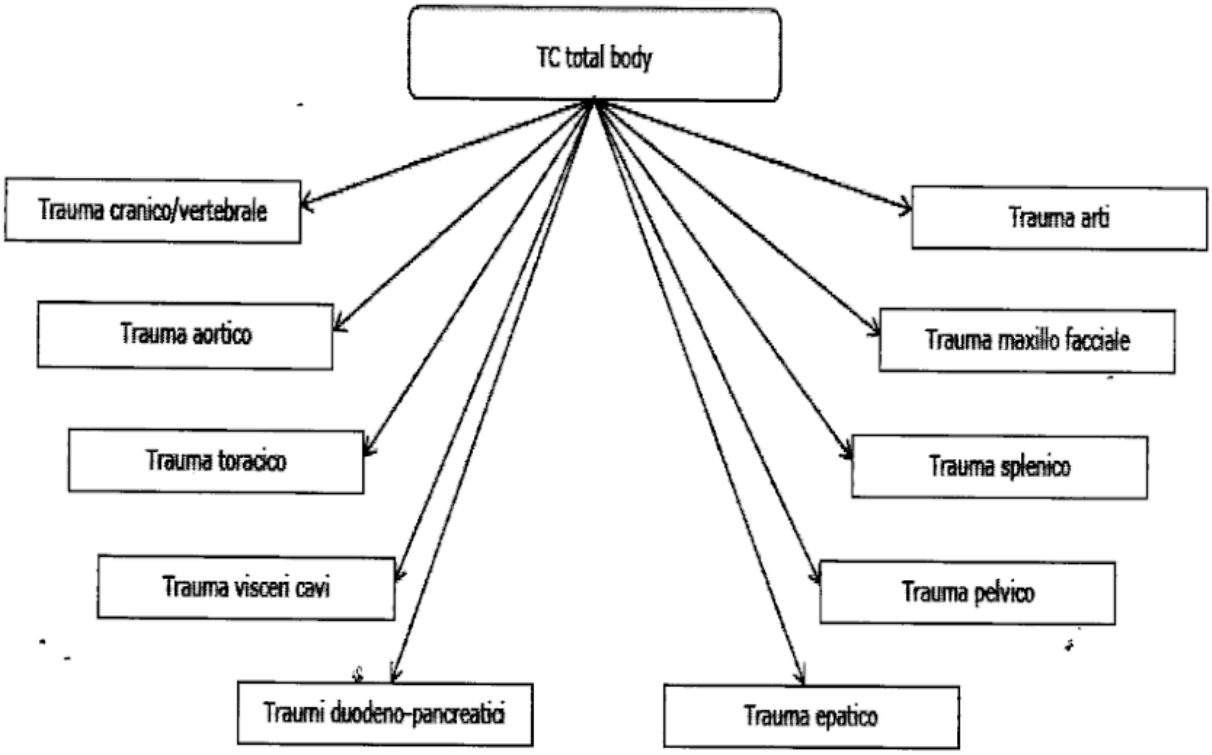
6.15 Reparto intensivo



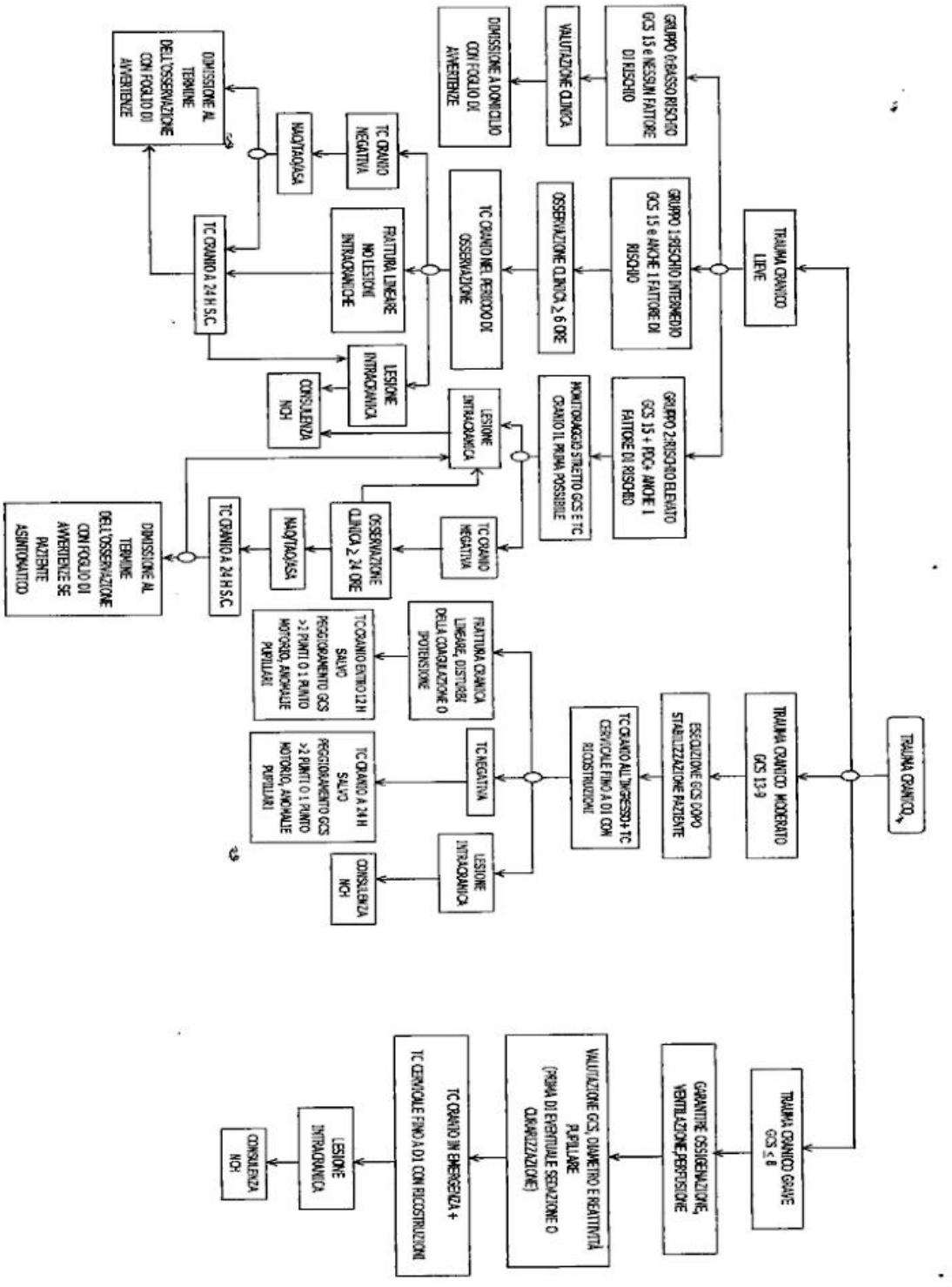
6.16 Reparto ordinario



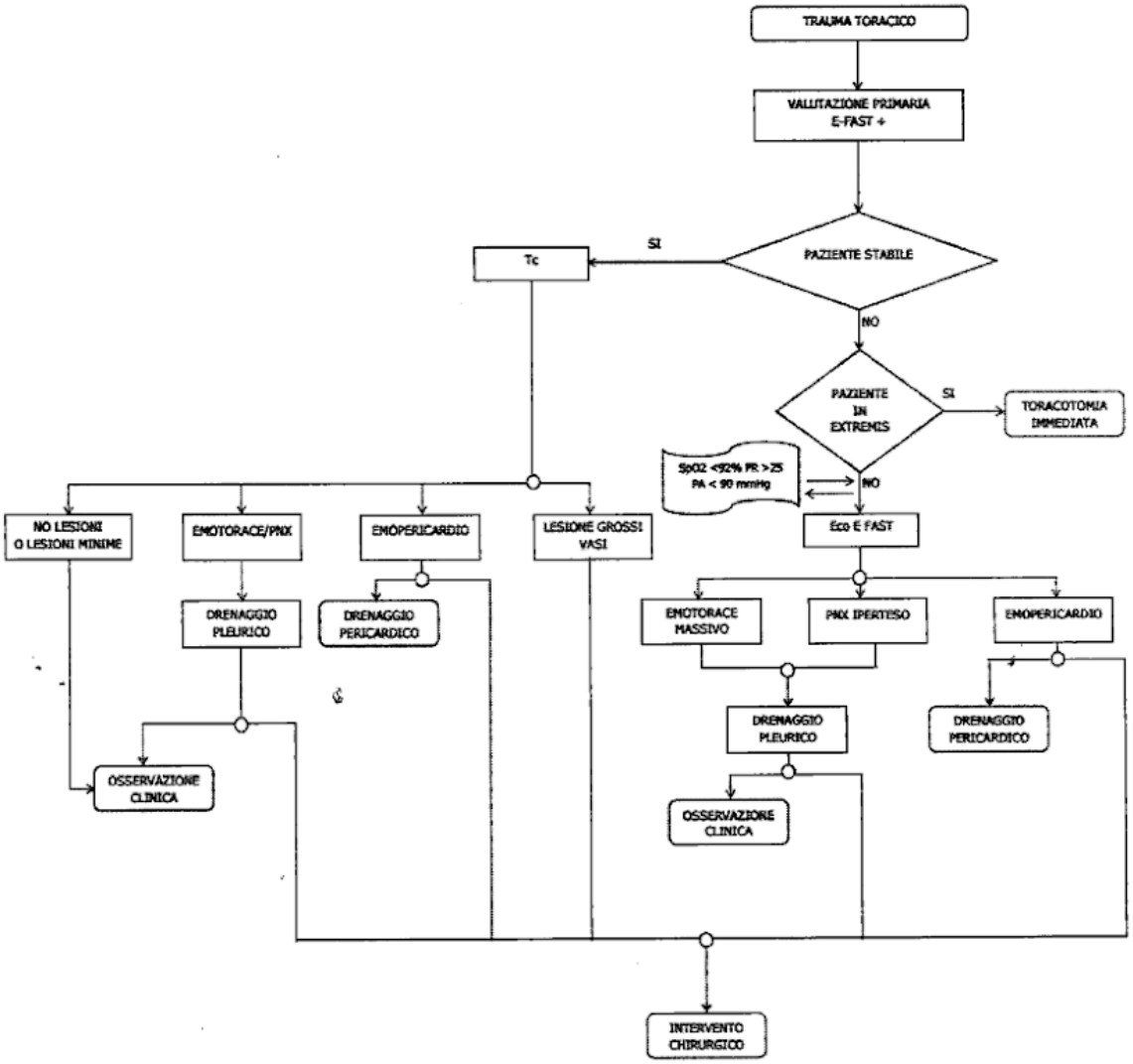
6.17 Lesioni specifiche



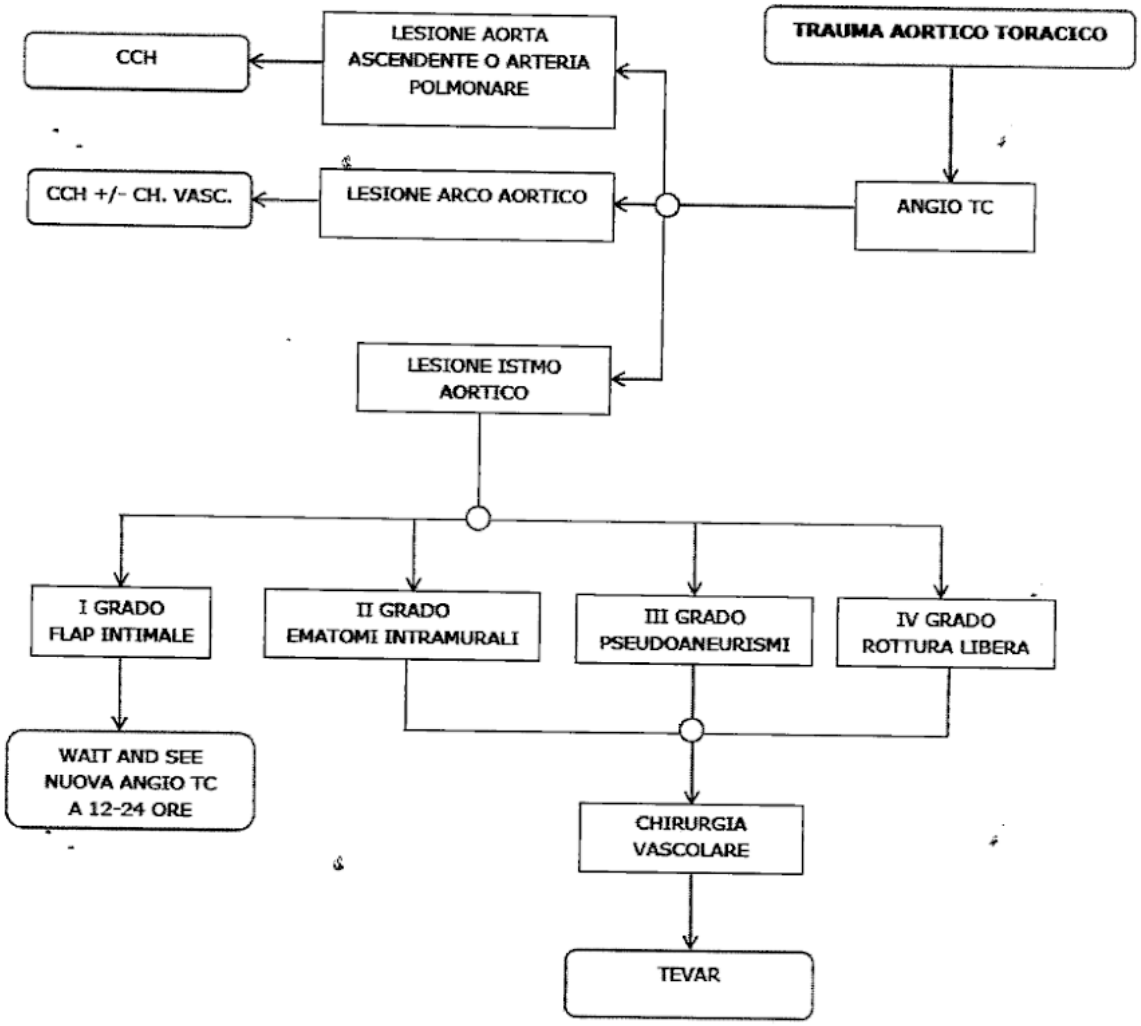
6.18 Trauma Cranico



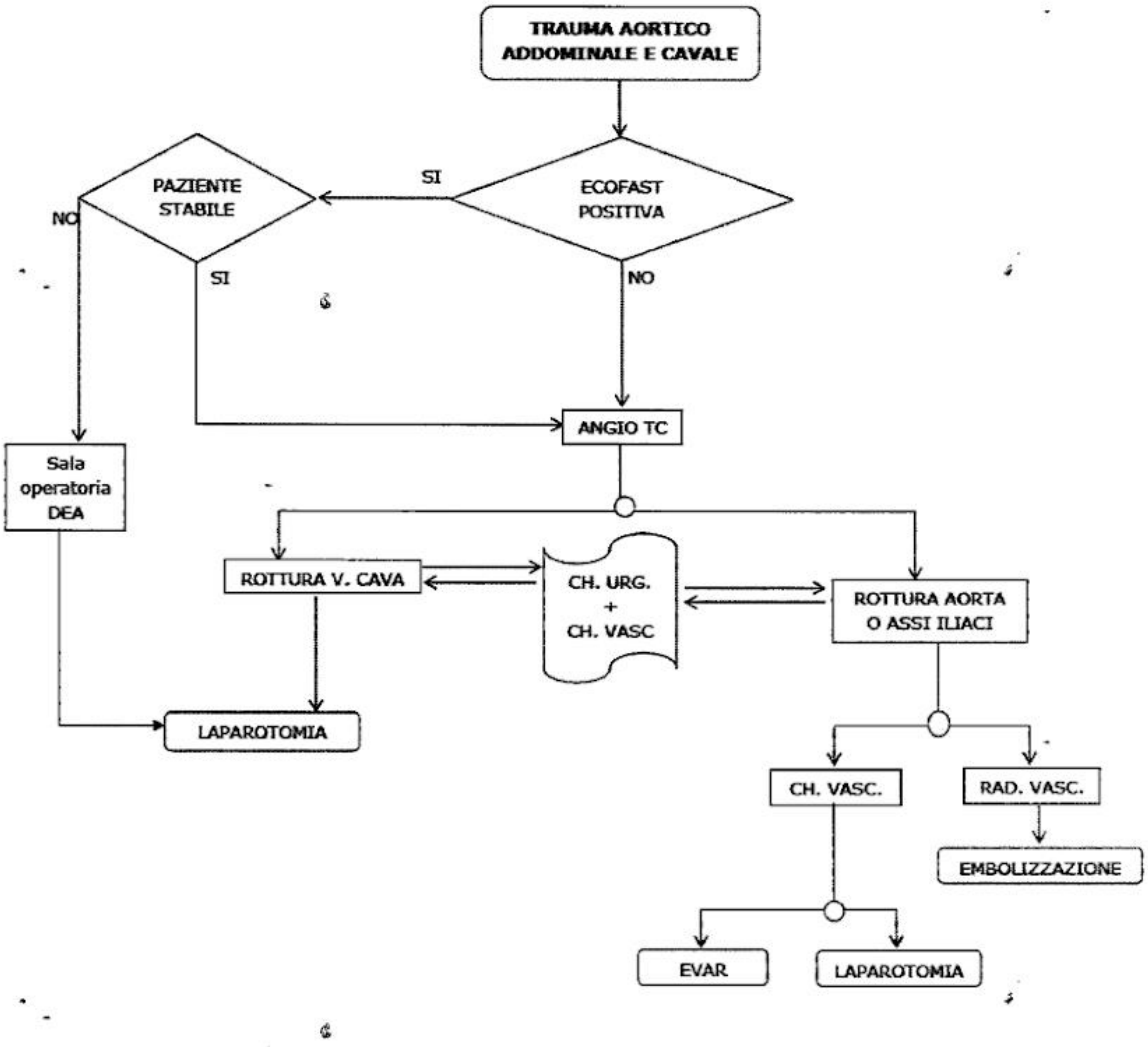
6.19 Trauma Toracico



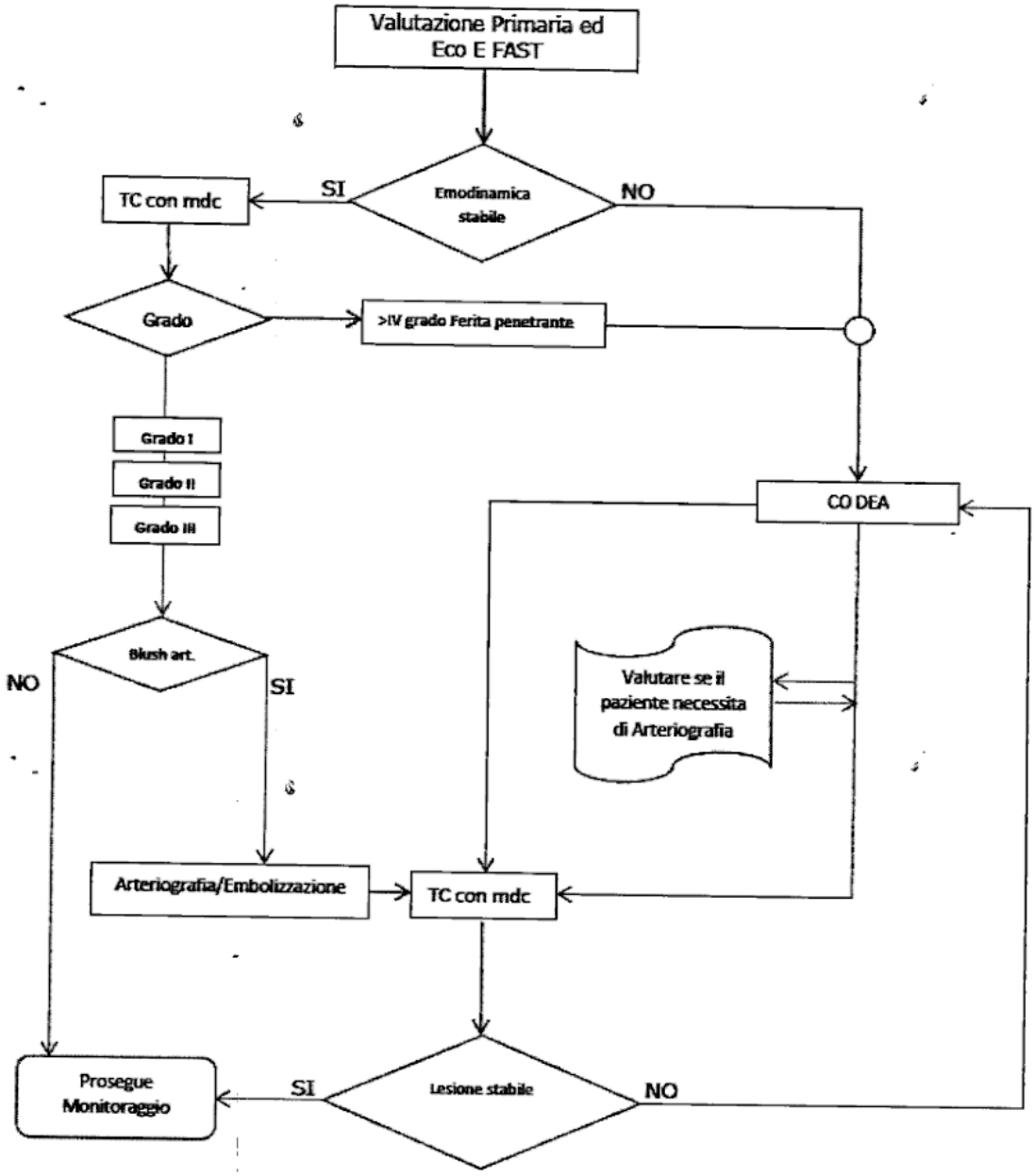
6.20 Trauma Aortico Toracico



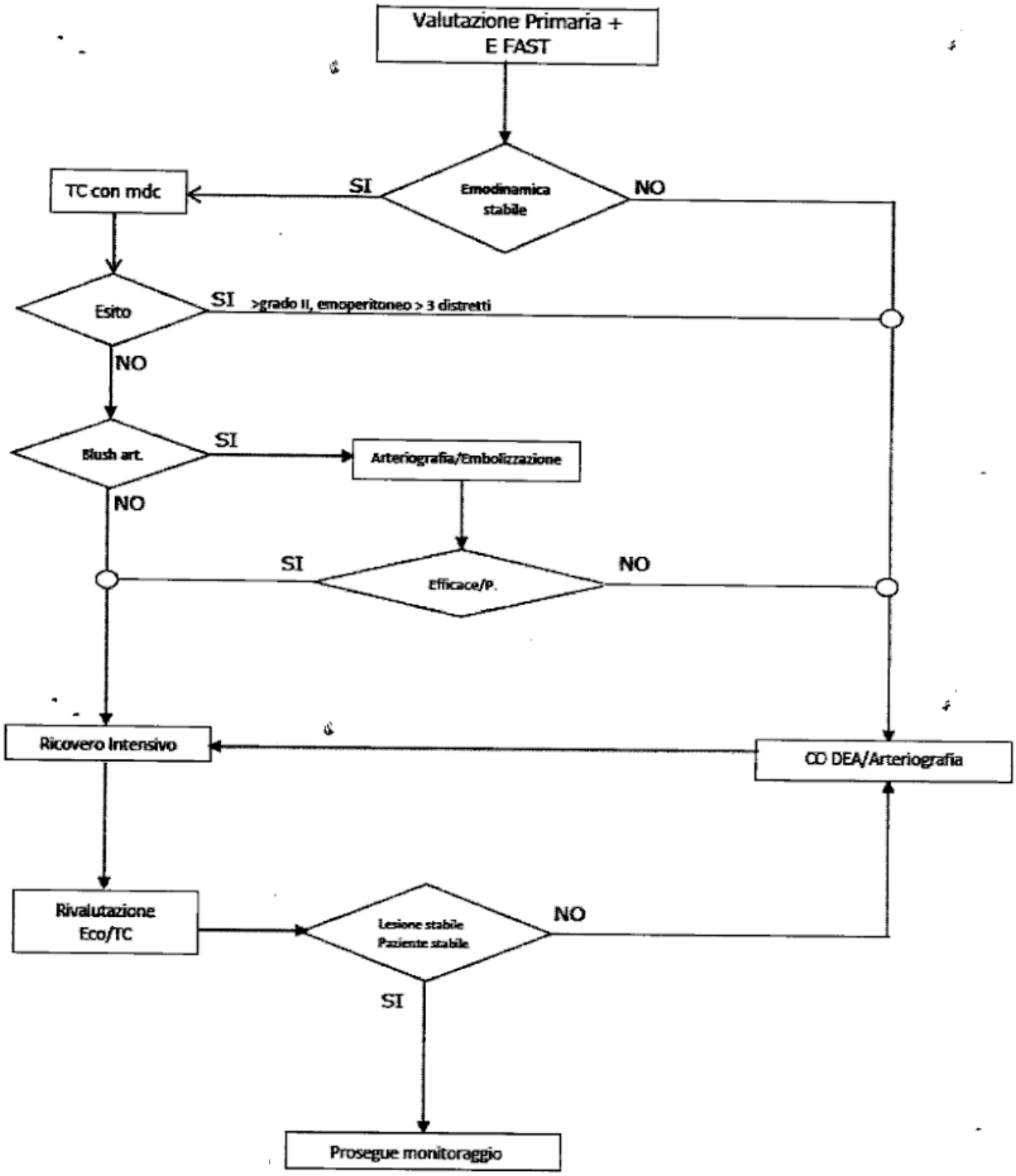
6.21 Trauma Aortico Addominale e Cavale



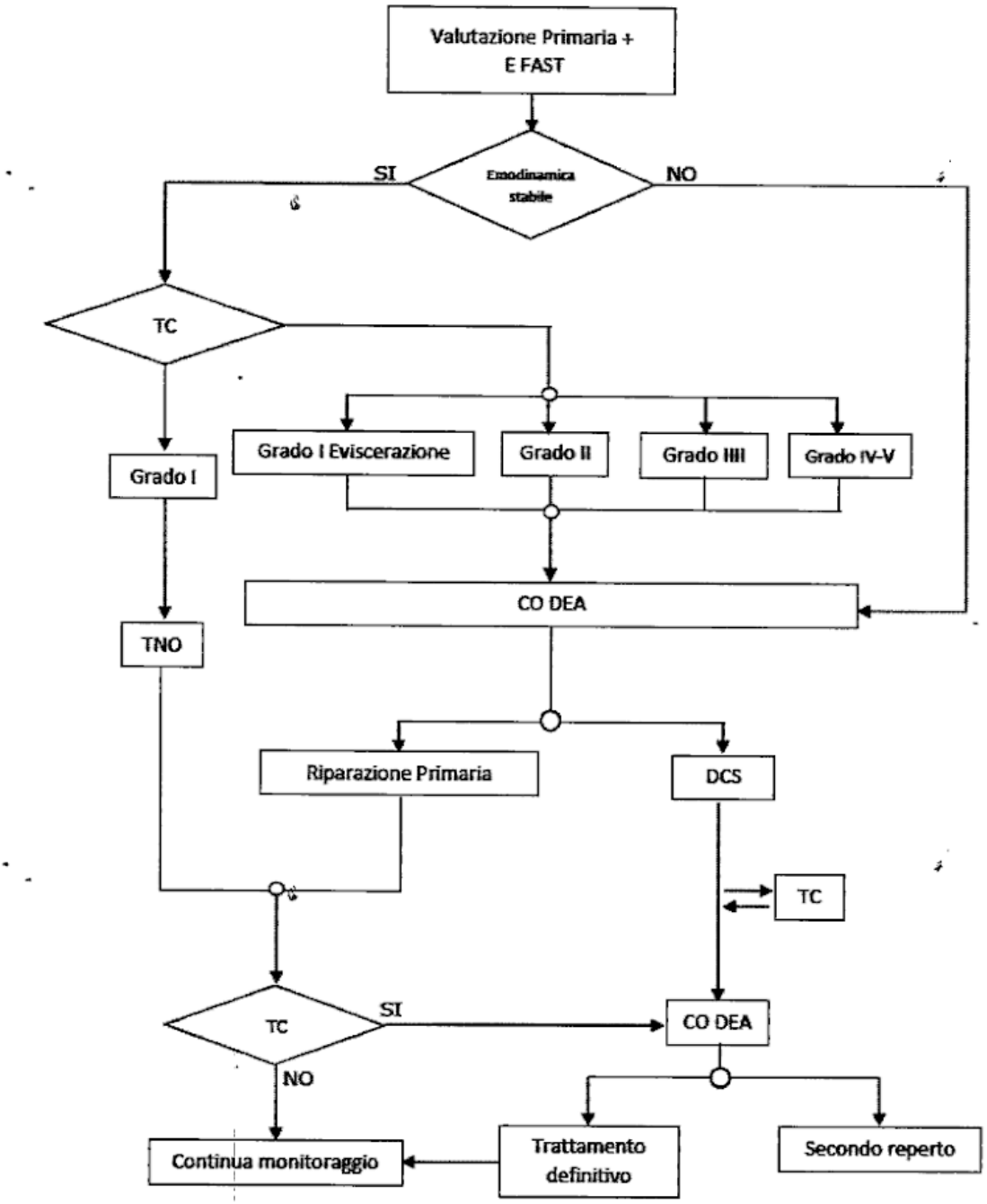
6.22 Trauma Epatico



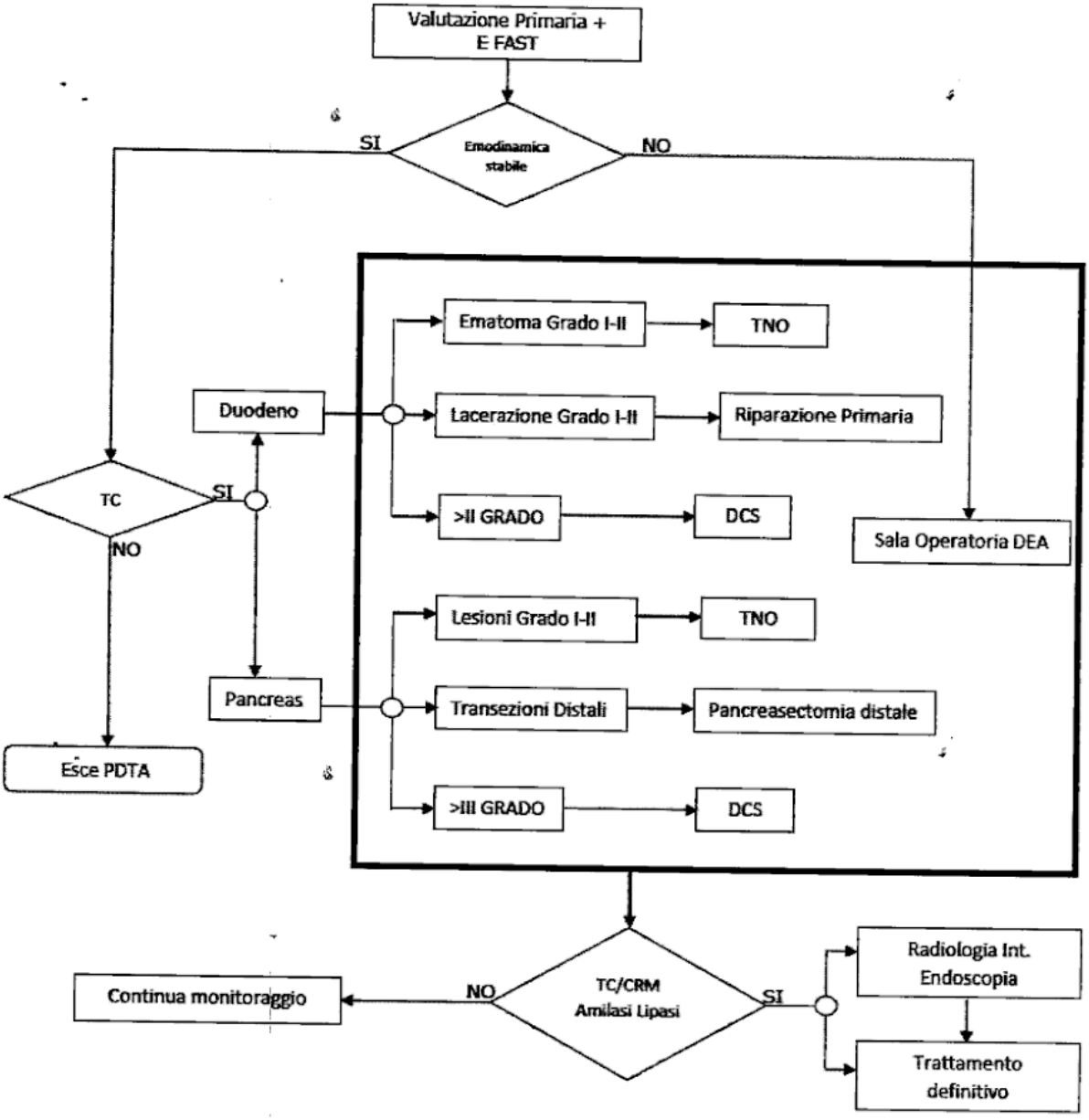
6.23 Trauma Splenico



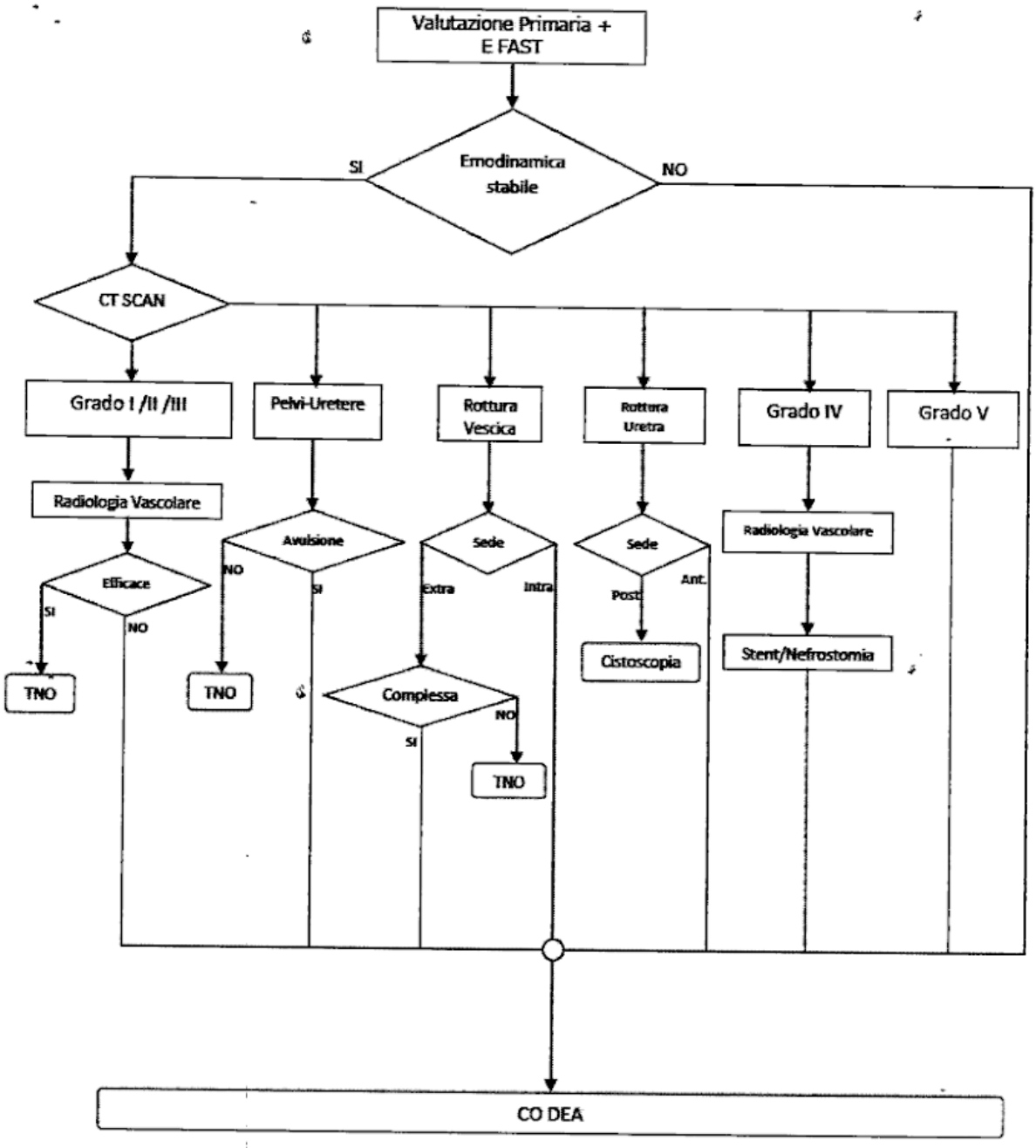
6.24 Trauma Visceri Cavi



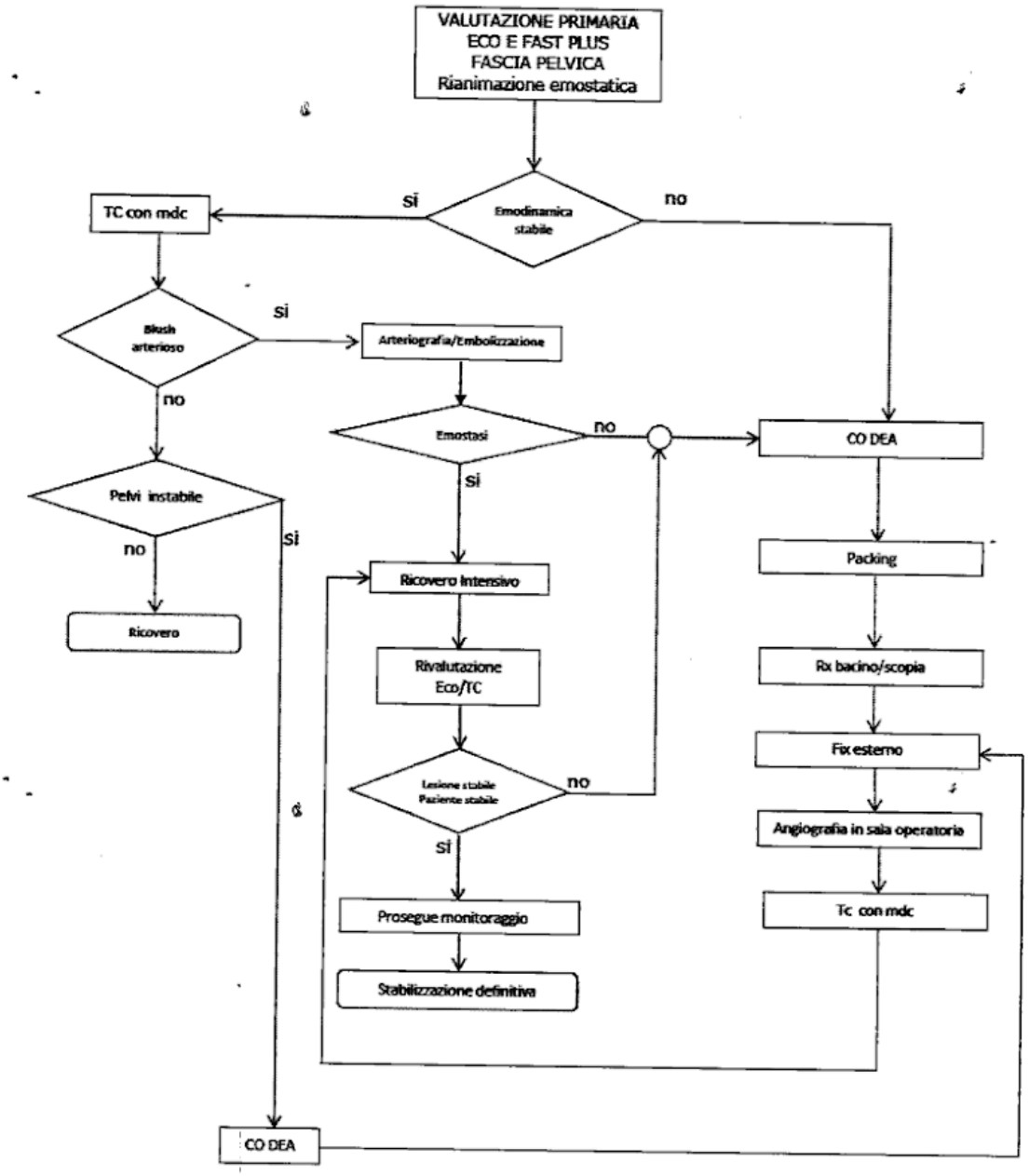
6.25 Traumi Duodeno-Pancreatici



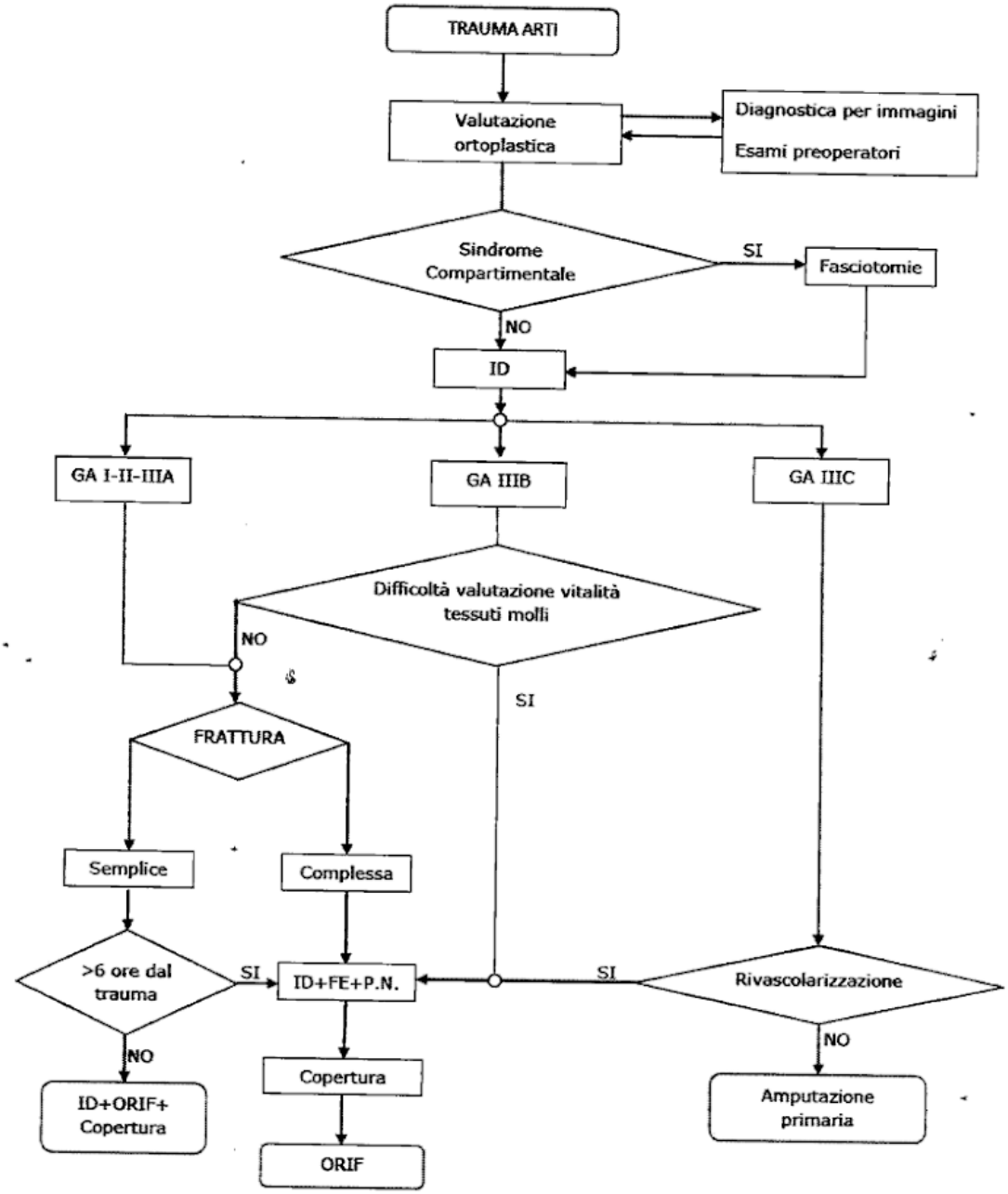
6.26 Traumi Urologici



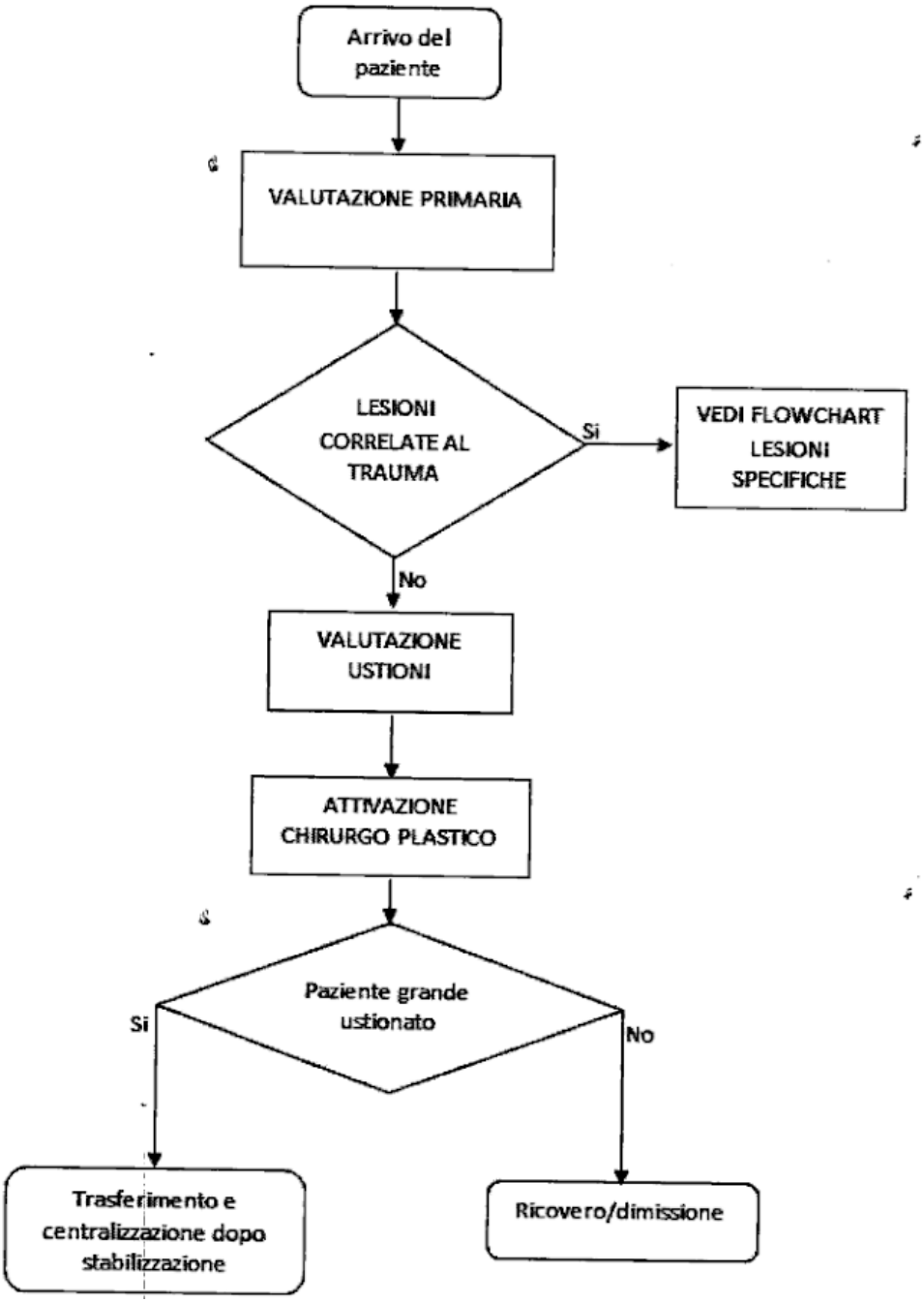
6.27 Trauma Pelvico



6.28 Trauma Arti



6.29 Ustioni


Arrivo del paziente
VALUTAZIONE PRIMARIA
LESIONI CORRELATE AL TRAUMA
Si
VEDI FLOWCHART LESIONI SPECIFICHE
No
VALUTAZIONE USTIONI
ATTIVAZIONE CHIRURGO PLASTICO
Paziente grande ustionato
Si
No
Trasferimento e centralizzazione dopo stabilizzazione
Ricovero/dimissione