How formative courses about damage control surgery and non-operative management improved outcome and survival in unstable politrauma patients in a Mountain Trauma Center

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AIM: *Aim of this study is to analyze how the starting of Course of Trauma in our hospital improved survival and organization in management of polytraumatized patients.*
MATERIAL OF STUDY: *We analysed all major trauma patients (Injury Severity Score (Injury Severity Score (ISS)> 15) treated at Emergency Department of the Santa Chiara Hospital between January 2011 and December 2014. The training courses (TC) were named "management of polytrauma" (MP) and "clinical cases discussion" (CCD), and started in November 2013. We divided the patients between two groups: before November 2013 (pre-TC group) and after November 2013 (post-TC group).*
RESULTS: *MTG's courses (EMC accredited), CCD and MP courses started in November 2013. The target of these courses was the multidisciplinary management of polytrauma patient; the courses were addressed to general surgeons, anaesthesiologists, radiologists, orthopaedics and emergency physicians. Respectively 110 and 78 doctors were formed in CCD's and MP's courses. Patients directly transported to our trauma centre rose from 67.5% to 83% (p<0,005), and E-FAST grew from 15.6% in the pre-TC group to 51.3% in the post-TC group. Time of access in operatory theatre decreased from 62 to 44 minutes. Early Mortality (within 48 hours from the hospital arrival) was 9% in the pre-TC group and 4.5% in the post-tc group (p<0.005).*
DISCUSSION: *Be needed to complete our goal. Further analysis and possible comparison with other trauma centers be needed to complete our goal*
CONCLUSIONS: *Our results show that in our experience the multidisciplinary approach to polytrauma patients increased early survival and improved outcome with an evidence of worker's satisfaction. However, the best practice would ask to start with the approval of procedures and guidelines by the hospital governance, followed by clinical practice changes, in order to create a dedicated emergency and trauma surgery group.*

KEY WORD: Damage Control Surgery, Non Operative Management, Trauma Course, Trauma Team, Trauma Center

Introduction

Polytrauma represents a high complex pathology, that needs to be treated by a multidisciplinary group.
An optimal "decision making" permits to manage polytraumatized patients with damage control approach or

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non-operative management (NOM), improving their survival and outcome [1,2].
The improving knowledge about the pathophysiology of blunt trauma has led to the identification of which patients to treat surgically and which not [2].
In our centre (S. Chiara Hospital in Trient Italy), we created some training courses, which brought to changes in the clinical and organizational management of polytrauma patients, improving outcome and survival.

Materials and Methods

We analysed all major trauma patients (Injury Severity Score (ISS) > 15) treated at the Santa Chiara Hospital between January 2011 and December 2014. The training courses (TC) were named "management of polytrauma" (MP) and "clinical cases discussion" (CCD), and started in November 2013. We divided the patients between two groups: before November 2013 (pre-TC group) and after November 2013 (post-TC group).
The Multidisciplinary Trauma Group (MTG) in our hospital was instituted in July 2012 inside the Emergency Department and emergency physicians, anaesthesiologists, radiologists, surgeons, orthopaedics, neurosurgeons, and nurse coordinators compose it.
In the same time a Register of Trauma was created.
In the Strategic Development Plane (SDP) of Trento Provincial Health Services (APSS Trento) for 2013-2015, polytrauma represented a high priority for governance [3].
We observed 98 patients treated during the 12 months period before November 2013 and 132 patients treated during the 12 months period following November 2013 (ISS>15), analysing early survival, time from emergency department to abbreviated laparotomy surgical incision, external fixation of pelvis in emergency department and proximal embolization of splenic artery in blunt splenic injuries.

Results

Since the beginning of the program, 100 specialists of provincial hub and spoke centres attended ATLS (Advanced Trauma Life Support) courses and 68 physicians of the Emergency Department attended E-FAST courses.
MTG's courses (EMC accredited), CCD and MP courses started in November 2013, in collaboration with the Surgery of Trauma UOSD Maggiore Hospital in Bologna and University of Torino, School of Medicine, Orthopaedic and Traumatology I Clinic, – C.T.O. Torino Italy (Table I).
The target of these courses was the multidisciplinary management of polytrauma patient; the courses were addressed to general surgeons, anaesthesiologists, radiologists, orthopaedics and emergency physicians.

TABLE I - *Training Courses 2013 -2014*

Course	Doctors	Nurses
ATLS	100	=
E-FAST	68	=
Clinical Audit "Thursday of Trauma"	96	204
Management of politrauma	78	19*
		*uditors

TABLE II - *Results data of multidisciplinary Trauma Group and Emergency department*

	2013	2014	*p*
Trauma patients ISS> 15	98	132	N.C.
Centralizzation	67 (68.4%)	111 (84%)	P<0.005
Time from ed discharge and surgical incision	67'	44'	
Mortality at 48h	9 (9.04%)	5 (4.54%)	P<0.005

Respectively 110 and 78 doctors were formed in CCD's and MP's courses.
The percentage of patients directly transported from the scene to our trauma centre rose from 67.5% in the pre-TC to 83% in the post-TC group, and secondary transfers were reduced from 13% to 4.3%. The performance of patients who received E-FAST examination upon the arrival grew from 15.6% in the pre-TC group to 51.3% in the post-TC group.
In our analysis the time between Emergency Department discharge and surgical incision decreased from 62 minutes in the pre-TC group to 44 minutes in the post-TC group.
Early Mortality (within 48 hours from the hospital arrival) was 9% in the pre-TC group and 4.5% in the post-TC group (p<0.005), meaning that early mortality was reduced by 50% (Table II).
Before November 2013 41 patients were accepted with diagnosis of spleen rupture and 40 in post TC group. 22 Vs 15 cases were submitted at surgery respectively pre post and proximal splenic artery embolization in the non-operative treatment (NOM) of blunt trauma was performed in 13 cases in the post-TC group (compared to no one in the pre-TC group).
Totally pelvic trauma accepted with ISS > 15 were 25 before November 2013 and 32 in the post TC group
From November 2013, in all patients with unstable pelvic trauma pelvic binder was positioned on the scene, in pre-TC group 8 patients was submitted at emergent external pelvis fixations in operatory room, while in post – TC group the number of esternal fixtiations was improved and 12 patients were treated with esternal fixation in emergency, three of whom directly in emergency department during damage control resuscitation.

A massive transfusion protocol (the preliminary procedure being ready since November 2013) was applied in 4 severe unstable pelvic trauma, guided by thromboelastography.

Discussion

In Italy the features defining a "Trauma Centre" are extremely heterogeneous. Despite national and international guidelines concerning Health System assistance and organization of major trauma, there is small evidence about strategies that each hospital must adopt to organize the management and improve the outcome of these patients [4].
According the new National Regulation on the definition of quality standards, structural, technological and quantitative related to hospital care. contained in Decree Law n° 70 of 2 April 2014, our hospital could be define a Center of Trauma, although it has specialities and technologies to be called Trauma Center [5].
Evidences show that even in accredited Trauma Centres, the decision-making process is entrusted to the experience and intuition of the trauma leader, and up to half of patients potentially undergo an inadequate treatment or are otherwise exposed to high error rate [2].
Differences are also described among hospitals due to the presence of several specialists sharing the trauma leader role (anaesthesiologists, surgeons or emergency physicians) [6,7].
Improved outcomes in these cases are directly proportionate to the organization of the Trauma Centre, based absolutely on multidisciplinary procedures and clinical pathways shared as "hospital guidelines" [2] and, as many study demonstre, to the presence of a Trauma Team, on ATLS compliance [8], which should decide the best patway for politraumatized patients because there are clinical evidence that execution of a total body ct scan in the hemodynamically stable patients represents the gold standard [10,11], while in case of instability the diagnostic first level is E-FAST and traditional radiology performed in Emergency Department with subsequent fast activation of operatory theatre.
This pathway can proceed smoothly only with clinical protocols validated by a multidisciplinary group [2,11-14].
Provincial Law n° 16 of 2010 defined the "provincial hospital system" and the concept of "hospital network" with the organization of hospitals in the province of Trento according to a "hub and spoke" system [15].
S.Chiara Hospital in Trento (Italy) is a II level DEA. Two surgical units share the emergency surgery on alternate days (24h) with operatory room active. Orthopedics are present on 24h but operatory room is active in the night only on call.
In 2011 Educational Bureau (EB) of APSS Trento started to provide the ATLS courses to the Emergency Department doctors working in spoke centres, according to the American College of Surgeons guidelines.
The current MTG of our Hospital was born in July 2012 in the Emergency Department and general surgeons, orthopaedics, anaesthesiologists, emergency physicians, neurosurgeons, radiologists, EMT physicians and nurse coordinators form it. Its function consists in organizing the Hospital Trauma Team.
A Register of Trauma was created for the first time in our hospital.
Subsequently the APSS Trento Strategic Development Plane (SDP) for 2013-2015 identified the need to "implement a new organizational structure that allows to centralize more complex trauma cases, according to a model of "Trauma Centre" [3].
After this first phase the MTG undertook a research program to determine which actions were supposed to empower what appeared to be "weak areas" in the chain of trauma (Fig. 1) ie: the centralization of severe trauma, the role of first level diagnostics (E-FAST), the damage control surgery manoeuvres in Emergency Department (pre-peritoneal pelvic packing; emergency thoracotomy), the early activation of the operating room,

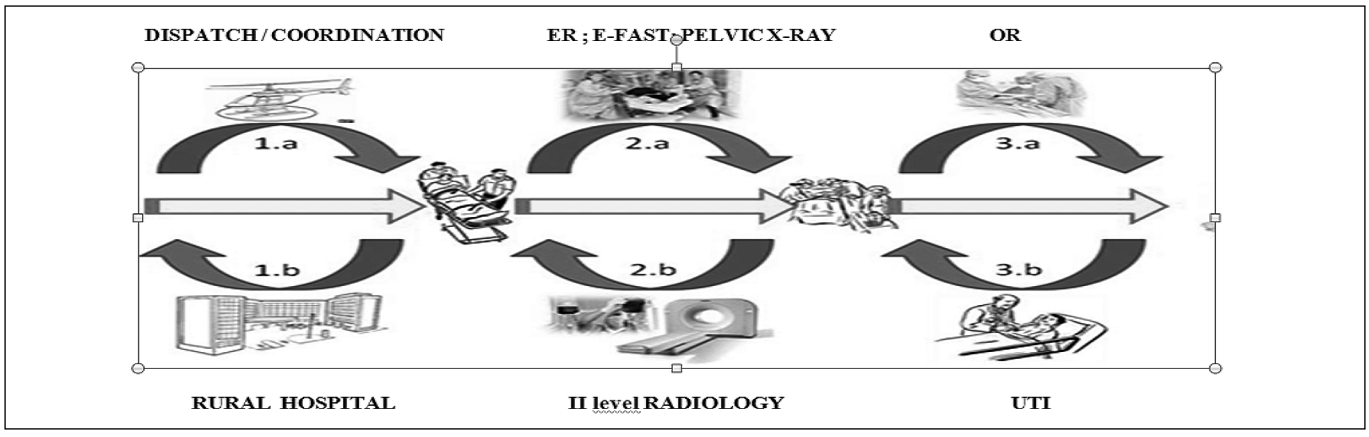

Fig. 1: Chain of Trauma.

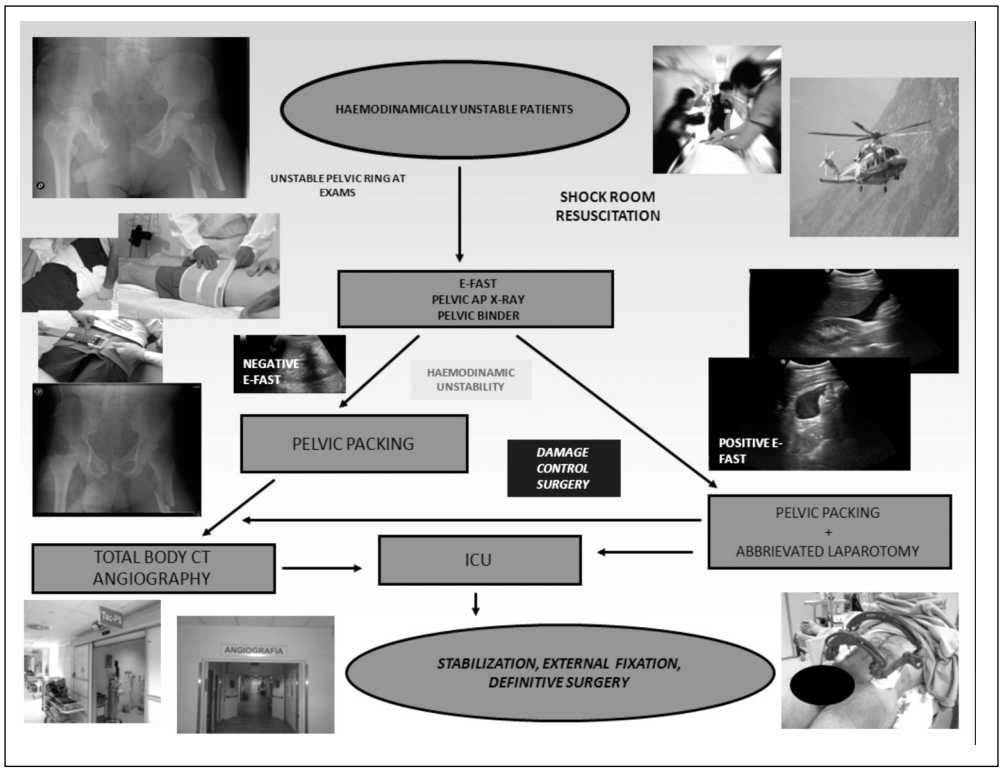

Fig. 2: Proposal of operative algorithm in pelvic trauma S.Chiara Hospital Trento Italy.

and finally, the non-operative treatment of blunt abdominal trauma.

Having pointed out the aspects to improve, the MTG started an educational program in collaboration with the EB sure that the cultural growth would led to an improve of outcome so as described in literature [16-20].

In November 2013 in our hospital (Hub center) we started a cycle of clinical audit (ECM courses named "Trauma Thursday") addressed to doctors and nurses working in the Operative Units involved in the primary survey of multiple trauma patients. In 2015 the event was extended in spoke centres.

Two hundred forty doctors and nurses employed in Emergency Departments, EMT-118, Surgery, Operating Room, Neurosurgery, Orthopaedics, Anaesthesiology and Intensive Care Unit, Radiology, Paediatric Surgery and other specialties, were formed.

To improve skills in the management of multiple trauma and orthopaedic surgery (currently urgent surgical trauma patients are managed by two different Surgical Operative Units), in February 2014 the MTG started a training course entitled "Management of Polytrauma" (MP) aimed at Emergency Physicians, Anaesthesiologists, Radiologists, Orthopaedics and Surgeons, including a clinical case discussion and group work in collaboration with the Trauma Surgery of Maggiore Hospital of Bologna and with the CTO (Orthopaedic Traumatology Centre) University of Torino.

MP allowed us to share experiences among specialists involved in primary survey, about clinical principles of DCS or NOM and organization for the first.

Every efforts started toward national and international model of trauma center. Further analysis and possible comparisons with other Trauma Centres will be needed to complete our goal To date the comparison comes from personal contacts with the national scientific societies, from meetings such as the ones organized by SICUT (Italian Society of Emergency and Trauma Surgery) and SIMEU (Italian Emergency Medicine Society) and participation at major national scientific events.

According to pelvic trauma in haemodinamically unstable pazients we write a local proposal for a decision algorithm for the management of unstable trauma pelvis inspired to the Consensus of Bergamo Italy 2013 [21,22] and finally we start to make esternal fixation directly in shock room with multidisciplinary evaluation.

Another result was starting NOM in blunt trauma of abdomen by angiographic procedure in according to evidence in literature [23] after November 2013 even if casistic is non statistically significative with a reduction of co-morbility expecially in patients submitted to other surgical procedures for vasculars, orthopaedics, neurosurgical and other lesions.

This entire path is currently aimed to answer to the strategic plan 2013-2015 and the provincial deliberation n° 2114 (5 december 2014) which identified S. Chiara Hospital as the hub provincial centre for major emergency surgery [24]

Four procedures are be approved by the Hospital Governance in order to complete our program (Table III). In the meanwhile, the MTG's choice to start up a formative plan led us to improve the quality of trauma

TABLE III - *Procedures approved*

Procedures	Specialists
Trauma team	EMT 118; emergency department; anesthesists; general surgeons; orthopaedics; radiologists; neurosurgeons
Managemente of trauma in shock room	Emergency Department; Anesthesists
Massive Transfusion	Emergency Department; Anesthesists; Transfusional Center
Activation operative room	General Surgeon; Emergency Department; Anesthesists

patient management in our Hospital.

Conclusions

Our results show that in our experience the multidisciplinary approach to polytrauma patients increased survival and improved outcome with an evidence of worker's satisfaction.
This project was voluntary born from the base, by first creating a cultural path based on scientific evidence, that would allow all MTG members to share clinical pathways and organizational changes which have led to a better management of these patients.
However, the best practice would ask to start with the approval of procedures and guidelines by the hospital governance, followed by clinical practice changes, in order to create a dedicated emergency and trauma surgery group.

Riassunto

OBIETTIVO: Obiettivo del nostro studio è quello di analizzare come, dopo la nascita del gruppo multidisciplinare sulla gestione del trauma maggiore presso l'Ospedale S.Chiara di Trento, lo svolgimento di un percorso formativo sulla gestione del politrauma, in collaborazione con l'ufficio formazione aziendale, abbia migliorato la sopravvivenza e l'organizzazione nella gestione del paziente politraumatizzato grave.
MATERIALI E METODI: Abbiamo analizzato i pazienti politraumatizzato gravi (Injury Severity Score (ISS) > 15) trattati presso l'Ospedale Santa Chiara di Trento prima e dopo novembre 2013 data di svolgimento di due corsi aziendali denominati "Management del Politraumatizzato" e "Discussione Casi Clinici", rivolti ai diversi specialisti coinvolti nella primary survey del paziente. Sono stati formati in totale 188 medici.
RISULTATI: La centralizzazione dei pazienti è passata dal 67.5% al 83%, e l'esecuzione della E-FAST dal 15.6% del gruppo precedente è stata documentata nel 51.3% dopo Novembre 2013. Il tempo di arrivo in sala operatoria si è ridotto da 62 a 44 minuti. La mortalità precoce (entro le 48 ore dal trauma) dal 9% nel gruppo pre è passata al 4.5% nel gruppo post formazione.
DISCUSSIONE: Il gruppo multidisciplinare sul trauma è stato istituito nel dipartimento di emergenza del nostro ospedale a luglio 2012 ed è composto da medici d'urgenza, medici dell'emergenza territoriale, rianimatori, chirurghi generali, ortopedici, neurochirurghi, radiology e coordinatori infermieristici. Dopo una prima fase è stata effettuata un'analisi per determinare quali fossero le "aree deboli" del sistema: la centralizzazione dei pazienti, la diffusione dell'E-FAST, le manovre rianimatorie della damage control surgery in shock room. Pertanto è stato istituito il Registro Traumi e, in collaborazione con l'Ufficio Formazione Aziendale è stato intrapreso un percorso culturale mirato a queste problematiche.
In letteratura è descritto come la crescita culturale e la gestione multidisciplinare porta ad un miglioramento dell'outcome dei pazienti politraumatizzati gravi. Un'ulteriore confronto con gli altri trauma center italiani sarà necessario per verificare i nostri percorsi e valutare i risultati.
CONCLUSIONI: La nostra esperienza mostra come i percorsi di formazione abbiano favorito la gestione multidisciplinare del paziente politraumatizzato grave, migliorando l'outcome e riducendo la mortalità precoce. Per favorire il consolidamento di questi risultati è utile che la "governance" continui il percorso di definizione delle procedure e delle linee guida istituzionalizzando il percorso promuovendo una riorganizzazione delle risorse finalizzata alla creazione di un gruppo multidisciplinare dedicato alla gestione delle urgenze chirurgiche e del trauma.

References

1. Rotondo MF, Schwab CW, McGonigal MD, et al.: "*Damage Control": An approach for improbe survival in exanguinating penetrating abdominal injury*. J Trauma, 1993; 35:375-82.

2. Archenbault PM, Turgeon AF,Wittenen HO, et al.: *Implementation and Evaluation of a WiKi involving multiple stakeholders including patients i the promotion of Best Practices in Trauma Care: The WiKi Trauma interrupted time series protmatocols* . JMIR Res Protocol, 2015; 4C(1): e21.

3. *Strategic Development Plane (SDP) of APSS Trento for 2013-2015. http://www.apss.tn.it/allegati/DOC_664088_0.pdf.*

4. Cennamo A (ed): *La gestione del Trauma Maggiore*. SIC (Italian Society of Surgery -Società Italiana di Chirurgia) 2010 edition.

5. Decree Law 70 of 2 April 2014: *Regulation on the definition of quality standards, structural, technological and quantitative related to hospital care in Italy*. Published on GU General Series 127 of 04.06.2015.

6. Calderale SM, Sandru R, Tugnoli G, Di Saverio S, et al.: *Comparison of quality control for trauma management between Westen*

and Eastern European Center. S.M. Calderale. World Journal of Emerg. Surg, 2008; 3:32.

7. *A comparative study of designated trauma team leaders on trauma patient survival and emergency department length-of-stay.* G.E. Cummings, D.C. Mayes, C. Stat, P. Stat. Can J Emerg Med, 2007; 9(2):105-110.

8. Tsang B, McKnee JM, Engels PT, Paton-Gay D, Widder SL: *Compliance o advanced trauma life support protocols in adult trauma patients in the acute settings*. WJES, 2013; 8:39 http: //www.wjes.org /content/8/1/39

9. Waada D, Nakamori Y, Yamakawa K, Yoshikawa Y, Kiguchi I, Tasaki O, Ogura H, Kiwagaya Y, Shimazu T. Hamasaki, Fujimi S: *Impact on survival of whole-body computed tomography before emergency bleeding control in patients with severe blunt trauma*. Critical Care, 2013; 17; R178.

10. Sierink JC, Saltzherr TP, Beenen LFM, Luitse J SK, Hollmann MW, Reitsma JB, Edwards M jr, Hohmann J, Beuker G JA, Patka P, Suliburk JW, Dijkgraaf MGW, Goslings J: *A multicenter, randomized controlled trial of immediate total-body CT scanning in trauma patients (REACT-2)*. BMC Emergency Medicine, 2012; 12:4.

11. Tugnoli G, Casali M, Villani S, Biscardi A, Baldoni F: *Trauma and emergency surgery. Organization and surgeons experience.* Ann Ital Chir, 2004; 75(4):407-13.

12. Chiara O, Cimbanassi S, Andreani S, Sammartano F, Pizzilli G, Girotti P, Mariani A, Bassi G, Baticci F, Fontana A, Mariani M, Massi M, Pozzi C, Ardizzone MV,Sansonna F, Vesconi S, Pugliese R: *The model of the Niguarda hospital trauma team in milan*. Chir Ital. 2008; 60(5):627-40.

13. Ruscelli P, Buccpierp F: *Outcomes in polytrauma: Comparison between the results achieved in the Cesena Trauma Centre and in the Regional Registry of a (RRGT) of Emilia Romagna, Italy.* Ann Ital Chir, 2014; 85(1):6-15.

14. Bellanova G, Motta A, Mazzetti G, Motter M, Fabris L, De Vigili G, Liguori G: *Damage Control Strategy and aggresive resuscitation in polytraumatizated patien with hypothermia. Importance of multidisciplinary approach from the territory to the operating room. Case Report*. Ann Ital Chir, 2013; 84 (4) 445-50. http:// www.annaliitalianidichirurgia.it /PDF/2013/445-450.pdf

15. Provincial law n° 16, 2010: http://www.consiglio. provincia.tn.it/doc/clex_21767.pdf?zid=a65bbb4a-d573-445d-a772-24afd9364241

16. Chamberlain S, Stolz U, Dreifuss B, et al.: *Mortality related to acute illness and injury in rural Uganda: Task shifting to improve outco*mes. PLO, SONE|DOI:10.1371/journal.pone.0122559 April 7, 2015.

17. Tugnoli G, Ribaldi S, Casali M, Calderale SM, Coletti M, Villani S, Biscardi A, Sinibaldi G, Giordano MC, Baldoni F: *The education of the trauma surgeon: The "trauma surgery course" as advanced didactic tool*. Ann Ital Chir, 2007; 78(1):39-44.

18. Buccoliero F, Ruscelli P: *Current trends in polytrauma management. Diagnostic and therapeutic algorithms operational in the Trauma Center of Cesena, Italy*. Ann Ital Chir, 2010; 81(2):81-93.

19. Acero NM, Matuk G, Luba J, Murphy M, Mc Kelvey S, Kolb G, Dumon KP, Resnik AS: *Managing a surgical exsanguination emergency in the operating room through simulation: An interdiscipinary approach*. J Surg Ed, 2012; 69(6):759-65.

20. Agnew SG, Jones CB: *Getting what you need from the hospital to succeed as a traumatologist*. J Orthop Trauma, 2013; (Suppl 1): S14-6.

21. Magnone S, Coccolini F, Manfredi R, Piazzalunga D, Agazzi R, Arici C, Barozzi M, Bellanova G, Belluati A, Berlot G, Biffl W, Camagni S, Campanati L, Castelli CC, Catena F, Chiara O, Colaianni N, De Masi S, Di Saverio S, Dodi G, Fabbri A, Faustinelli G, Gambale G, Capponi MG, Lotti M, Marchesi G, Massè A, Mastropietro T, Nardi G, Niola R, Nita GE, Pisano M, Poiasina E, Poletti E, Rampoldi A, Ribaldi S, Rispoli G, Rizzi L, Sonzogni V, Tugnoli G, Ansaloni L: *Management of hemodynamically unstable pelvic trauma: results of the first Italian consensus conference.* (Cooperative guidelines of the Italian Society of Surgery, the Italian Association of Hospital Surgeons, the Multi-specialist Italian Society of Young Surgeons, the Italian Society of Emergency Surgery and Trauma, the Italian Society of Anesthesia, Analgesia, Resuscitation and Intensive Care, the Italian Society of Orthopaedics and Traumatology, the Italian Society of Emergency Medicine, the Italian Society of Medical Radiology -Section of Vascular and Interventional Radiology- and the World Society of Emergency Surgery). World J Emerg Surg, 2014; 9(1):18. doi: 10.1186/1749-7922-9-18. http://www.wjes.org/content/9/1/18/abstract

22. Bellanova G, Brolese A, Folgheraiter G, Zini A, Liguori G, Geat E, Buccelletti F, Ramponi C, Musetti A, Dematte E, Papadia D: *Damage control resuscitation nel paziente emodinamicamente instabile con e-fast negativa. La gestione in shock room del paziente con frattura instabile del bacino. Esperienza Ospedale S. Chiara di Trento.* I.X National Congress SIMEU (Italian Society of emergency medicine). Turin, Italy 6-8 Novembre 2014.

23. Tugnoli G, Bianchi E, Biscardi A, Coniglio C, Isceri S, Simonetto L, Gordini G, Di Saverio S: *Nonoperative management of blunt splenic injury in audults: there is (still) a long way to go. The ruslts of the Bologna-Maggiore Hospital trauma center experience and development of a clinical algorithm*. Surg. Today

24. Provincia di Trento, Italy: *Provincial Deliberation 2114 12-5-2014* http://www.delibere. provincia.tn.it/scripts/ gethtml Deli.asp? Item=0&Type=HTML

Commento - Commentary

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Professor of General Surgery

Pur se non si tratta di un articolo scientifico esso rappresenta una testimonianza interessante a documentazione di come può evolversi positivamente nei suoi risultati l'organizzazione sanitarie di un presidio ospedaliero nei confronti di politraumi maggiori, con instabilità emodinamica iniziale, applicando sistematicamente i principi del Damage Control ed un impegno multidisciplinare, sulla base di specifici corsi preliminari di addestramento al lavoro in squadra, seguiti da riconsiderazioni epicritiche sui dati clinici.

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Although it is not a scientific paper it is an interesting witness of how can positively evolve in its results an health organization of a hospital in front of major polytrauma, with initial hemodynamic instability, by means of the systematic applying the principles of the Damage Control and an interdisciplinary endeavor, on the basis of specific training courses, to practice working as a team, followed by reconsideration of results on clinical data.