PERSPECTIVE
The World Health Organization trauma checklist versus Trauma Team Time-out: A perspective

Mark FITZGERALD,1,2 Stephanie REILLY,1,2 De Villiers SMIT,2,3 Yesul KIM,2 Joseph MATHEW,1,2,3 Ellaine BOO,2 Abdulrahman ALQAHTANI,4 Sharfuddin CHOWDHURY,4 Ahamed DAREZ,5 JMA Bruno MASCARENHAS,5,6 Francis O’KEEFFE,2,6 Michael NOONAN,1,2,3 Chris NICKSON,7 Marc MARQUEZ,3 Wang An LI,8 Yan Ling ZHANG,8 Kim WILLIAMS1,2, and Biswadev MITRA2,3

1Trauma Services, The Alfred Hospital, Melbourne, Victoria, Australia, 2National Trauma Research Institute, Monash University, Melbourne, Victoria, Australia, 3Emergency and Trauma Centre, The Alfred Hospital, Melbourne, Victoria, Australia, 4Trauma Service, King Saud Medical City, Ministry of Health, Riyadh, Kingdom of Saudi Arabia, 5Tamil Nadu Accident and Emergency Initiative, Government of Tamil Nadu, Chennai, India, 6Emergency Services, The Mater Misericordiae University Hospital, Dublin, Ireland, 7Intensive Care, The Alfred Hospital, Melbourne, Victoria, Australia, 8Trauma Service, Huizhou First Hospital, Guangdong, China, and 9Department of Epidemiology and Preventive Medicine, Monash University, Melbourne, Victoria, Australia

Abstract
Time-out protocols have reportedly improved team dynamics and patients’ safety in various clinical settings – particularly in the operating room. In 2016, the World Health Organization (WHO) introduced a Trauma Care checklist, which outlines steps to follow immediately after the primary and secondary surveys and prior to the team leaving the patient. The WHO Trauma Care checklist’s main perceived benefit is the prompting of clinicians to complete trauma admissions as per evidence-based guidelines. The WHO Trauma Care checklist, while likely to be successful in reducing errors of omission related to hospital admission, may be limited in its ability to reduce errors that occur in the initial 30 min of trauma reception – when most of the life-saving decisions are made. To address this limitation, a Trauma Team Time-out protocol is proposed for initial trauma resuscitation, targeting the critical first 30 min of hospital reception.

Key words: checklist, medical error, resuscitation, time-out, trauma, trauma team.

Introduction
Trauma resuscitation is fast-paced and challenging, involving numerous handoffs, personnel and consultations. Under such pressure, team members are required to make time critical, life-saving decisions. It has been prospectively demonstrated that in the first 30 min of reception and resuscitation of severely injured patients by experienced trauma teams, a critical decision linked to a life-saving intervention is made every 72 s.1 During hospital trauma resuscitation, good team communication and presence of clear leadership has been linked to expeditious care and improved patient outcomes.2

Adverse events in hospitals are common, reported to occur in approximately one in 10 patients.3 Most commonly, these adverse outcomes are operation or drug related, usually caused by communication breakdown between healthcare professionals.3–5 In the hectic stages of trauma resuscitation, errors are common. Even in mature, advanced trauma centres, error-free resuscitations remain uncommon.1

Trauma resuscitation is unlike most other clinical situations – with a large multi-disciplinary team consisting of a variety of combinations of medical, nursing, paramedical and technical staff performing multiple procedures and evaluations simultaneously.

Standardised reception and resuscitation of the severely injured has been associated with improved decision making, coordinated care and a reduction in mortality and morbidity.1,6,7 Programmes that originally

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addressed the trauma knowledge of individual clinicians are now increasingly focused on trauma team coordination and communication. Although these programmes have resulted in early and more effective delivery in trauma care, protocol-driven techniques are further warranted as trauma scenarios can substantially differ from other clinical or training settings.

In 2016, the World Health Organization (WHO) published a general Trauma Care checklist, which recommends steps to follow immediately after primary and secondary surveys and then again prior to the team leaving the patient (Table 1). It has been suggested that the WHO trauma checklist is associated with improved patient outcomes. The WHO trauma checklist’s main perceived benefit is the prompting of clinicians to complete the trauma admission as per evidence-based guidelines. Furthermore, trials highlight that implementations of protocols can prevent medical errors by reinforcing existing trauma management procedures and may be a valuable tool for continued training and maintenance.1

The general WHO trauma checklist, while likely to be successful in reducing errors of omission related to hospital admission, may be limited in its ability to reduce errors associated with the initial reception and resuscitation of the severely injured. Fixation errors, poor leadership, multi-tasking and communication breakdowns are known to contribute to poor outcomes in trauma resuscitation and are most likely to occur in the initial 30 min of trauma reception, when most of the life-saving decisions are made.1 Importantly, this period of primary and secondary survey is not addressed by the WHO trauma checklist.

These key 30 min of hospital trauma reception and resuscitation provide an opportune time frame to initiate quality improvement strategies such as an enhanced time-out. During this critical window, the addition of a Trauma Team Time-out protocol that focusses on primary and secondary survey care related to trauma reception and resuscitation may address the gap in the WHO checklist. Previously mentioned variables such as leadership and timely life-saving interventions, as well as team member compliance, may then be addressed.

### Discussion

A Trauma Team Time-out protocol may add to such initiatives and reduce variability by providing

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**TABLE 1.  World Health Organization trauma care checklist**

| Immediately after primary and secondary surveys | Yes, done | No |
|------------------------------------------------|-----------|----|
| Is further airway intervention needed?         |           |    |
| May be needed if:                              |           |    |
| GCS 8 or below                                |           |    |
| Hypoxaemia or hypercarbia                     |           |    |
| Face, neck, chest or any severe trauma        |           |    |
| Is there a tension pneumo-haemothorax?        | Yes, chest drain placed | No |
| Is the pulse oximeter placed and functioning? | Yes       | NA |
| Large-bore IV placed and fluids started?      | Yes       | Not indicated | Not available |
| Full survey for (and control of) external bleeding, including: | Scalp | Perineum | Back |
| Assessed for pelvic fracture by:              | Exam      | X-ray | CT |
| Assessed for internal bleeding by:            | Exam      | Ultrasound | CT |
| Is spinal immobilisation needed?              | Yes, done | Not indicated |
| Neurovascular status of all four limbs checked? | Yes | warming | No |
| Is the patient hypothermic?                   | Yes, warming | No |
| Does the patient need (if no contraindication) | Urinary catheter | NG tube | Chest drain | None indicated |
| Before team leaves the patient                |           |     |
| Has the patient been given?                   | Tetanus vaccine | Analgesics | Antibiotics | None indicated |
| Have all tests and imaging been reviewed?     | Yes       | No, follow-up plan in place |
| Which serial examinations are needed?          | Neurological | Vascular | Abdominal | None |
| Relevant trauma chart or form completed       | Yes       | Not available |
reproducible communication methods to ensure task completion. The aim of a Trauma Team Time-out protocol is to improve communication, promote team goals and create standardised care pathways – thus reducing adverse events and improving patient outcomes.

Use of protocol-driven timeouts and checklists are well-established tools for improving team dynamics and patient outcomes – especially in critical situations where even obvious diagnostic and/or treatment tasks may be overlooked. Their effectiveness has been demonstrated with the Surgical Safety Checklist and Time-out protocol, established by the WHO and The Joint Commission on accreditation of healthcare organisations. This checklist follows the patient through the procedure, with specific safety checkpoints prior to anaesthesia, prior to skin incision, and prior to the patient leaving the operating room. A prospective trial of the checklist demonstrated improvements in surgical outcomes, with reduced postoperative complications and reduced surgical mortality.

Since its inception, this surgical checklist has become the standard of care in operating rooms. A key strength of the checklist is at the pre-incision time point, where it is thought to reduce the potential for wrong site surgery, wrong procedure and near misses. Although difficult to establish a causal relationship between Time-out protocols and improvement in morbidity and mortality, checklists improve teamwork, staff retention, promote early reporting of issues or concerns and reduce complications. Written checklists improve compliance with evidence-based perioperative medicine. Staff surveys have demonstrated that most staff believe surgical safety checklists improve communication and promote a shared safety responsibility within healthcare teams.

Reasons for poor compliance and utilisation of Time-out protocols in other clinical settings have been recently explored. Staff surveys of the surgical Time-out protocol have suggested that common barriers include a lack of identified leadership, individual resistance to the checklist, checklist fatigue, a lack of collaboration in the development of the protocol and insufficient staff training prior to implementation.

Other examples include difficulty integrating the checklist into the conventional workflows and higher frustration experienced by the team with the perception of an increased workload. However, previous studies indicate that workload-related frustration may decrease with leadership, clear communication, training and repeated use.

The proposed Trauma Team Time-out checkpoints could be considered mandatory, starting pre-arrival and continuing to a debriefing session (Table 2).

Prior to patient arrival, team members are assigned roles, one as a team leader and others as primary roles according to ‘ABCDE’ steps. The appointment of a team leader in this scenario is important – and key to overall team performance and patient outcomes. It is critical for roles to be clarified prior to patient arrival for optimal team performance. Team members should wear identification that represents their primary assigned roles, which should be easily recognisable as well as comprehensible. This has been achieved in a variety of ways, including adhesive labels, colour coded caps or labelled tabards.

### TABLE 2. Trauma Team Time-out

| 1. Who? | Team introduction |
| --- | --- |
|  | • Notification of serious inbound patient |
|  | • Trauma team assemble prior to patient arrival |
|  | • Team leader assigned to brief the team: specify (i) What is currently known, (ii) Plan A (expected injuries and Rx), (iii) Plan B (triggers for when to deviate from Plan A and likely causes), (iv) Role allocation (according to Plan A); ensure PPE; set up |
|  |  |
| 2. Why? | Patient arrival and handover |
|  | • Team leader to clarify MIST |
|  | • Outline LSI (already delivered and those planned) |
|  | • Arrival situation report: summarise primary survey, chest X-ray and extended FAST findings |
|  |  |
| 3. What? | 5 min MIST situation report |
|  | • Mechanism and principle injuries repeated |
|  | • Team leader indicates abnormal vital signs (incl. GCS) |
|  | • Team leader prioritises LSI (incl. haemorrhage control, airway patency, ventilator support, IV access assignment) |
|  | • Team leader notifies consultants, specialist services, surgical staff and blood bank as required |
|  |  |
| 4. Where? | 20 min summary and disposition decision (incl. diagnosis and treatments) |
|  | • Team leader to summarise progress and disposition decision (incl. diagnosis and treatments) |
|  |  |
| 5. Phew! | Team debrief |
|  | • Team leader should ensure an immediate debrief with the team where members will provide feedback |

FAST, focused assessment with ultrasound for trauma; GCS, Glasgow Coma Scale; LSI, lifesaving interventions; MIST, mechanism, injury, signs and prehospital treatment; PPE, personal protective equipment.
Care improves with an understanding of the patient presentation and prehospital evaluation. In addition to pre-arrival preparations, pre-arrival information is important for completing primary survey task completion as well as maintenance of workflow and compliance.

On patient arrival, the Trauma Team Time-out requires allowances for verbalisation of patient details from prehospital responders and recognition of initial actionable outcomes. During resuscitation the time-out requires verification of procedures and addressing other team members throughout the process.

As with any learned process, incorporating the Trauma Team Time-out into daily clinical routine requires adjustments to ingrained behavioural patterns. For these reasons, initiation and formalisation of a Trauma Team Time-out protocol requires careful consideration and collaboration between trauma team members and appropriate pre-implementation training for all involved. Prospective evaluation of implementation and its associated maturation over time is essential.

**Conclusion**

Time-out protocols have been reported to improve team dynamics and patient safety in various clinical settings, particularly in the surgical operating room. They disseminate critical patient information in a systematic fashion to all team members with varied roles.

A key component of a time-out implementation is to promote clear goals, ensure timely and accurate decisions as well as to assist performance in a highly pressurised setting. The care of a trauma patient is strengthened when a team leader is assigned to an inclusive, informed team. Improved team coordination and communication during the resuscitation of severely injured patients improves patient outcomes.

It is expected that the previously established benefits of the time-out protocols in surgical fields (reducing near misses, improving team dynamic and establishing safety goals) will be largely reproducible in the trauma setting.

This five-step Trauma Team Time-out protocol is proposed to fill the ‘resuscitation gap’ in the WHO trauma checklist – by assisting with team integration, clarifying roles and the sequence of events, unifying decision making – and in so doing reduce adverse events within the critical first 30 min of hospital trauma reception and resuscitation.

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**Competing interests**

None declared.

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