2021-08

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<http://hdl.handle.net/10026.1/17561>

10.1136/emmermed-2019-208830

Emergency Medicine Journal

BMJ

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**Implementation of the 'TAKE STOCK' Hot Debrief Tool in the Emergency Department:
A Quality Improvement Project.**

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Key words

Major incidents, clinical care

Psychology, staff support

Major trauma management

Paediatrics, paediatric emergency medicine

Word count: 2870

Tables: 1

Figures: 4

Supplementary Material: 2

References: 20

Declaration

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20 21 **Contributorship Statement**

22 Max Sugarman conceived the idea for the project, derived the TAKE STOCK tool, led
23 implementation of the project, undertook data collection and analysis, drafted the initial
24 manuscript and revised all subsequent versions.

25
26 Blair Graham contributed to idea for the project, advised on implementation of the project,
27 assisted data analysis, draft of the initial manuscript and revised all subsequent versions.

28
29 Sarah Langston contributed to the idea for the project, supervised implementation of the
30 project, and provided review of all versions of the manuscript.

31
32 Pamela Nelmes contributed to the idea for the project and provided review of all versions of
33 the manuscript.

34
35 John Matthews conceived the idea for the project, supervised implementation of the project,
36 and provided review of all versions of the manuscript.

37 38 **Ethics**

39
40 Departmental approval was sought to undertake this project and registration with the host
41 institution was obtained (Ref: 104918/19). Research ethics approval was not required.

42 43 44 **Funding**

45 No external funding was provided

46 47 **Patient and Public Involvement Statement**

1 This research was done without patient involvement. Patients were not invited to comment
2 on the study design and were not consulted to develop patient relevant outcomes or interpret
3 the results. Patients were not invited to contribute to the writing or editing of this document
4 for readability or accuracy.

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What is already known on this subject?

Hot Debriefing (HoD) describes a team-based discussion typically occurring very shortly after a significant event and is relevant to the Emergency Department (ED). Reported benefits include improved teamwork, staff wellbeing and the identification of learning points and equipment problems. There is currently little evidence that HoD occurs as standard in UK EDs.

What does this report add?

This paper details a QIP that successfully created and integrated the 'TAKE STOCK' HoD tool into a busy ED in the North-West of England. It reports the benefits of HoD perceived by those involved in the events. The feedback has been greatly encouraging and it is hoped that this tool can provide a structured approach to HoD, which may eventually be adopted more widely.

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Abstract

Hot Debriefing (HoD) describes a structured team-based discussion which may be initiated following a significant event. Benefits may include improved teamwork, staff wellbeing and identification of learning opportunities. Existing literature indicates that whilst staff value HoD following significant events, it is infrequently undertaken in practice. Internationally, several frameworks for HoD have been developed, although none are widely adopted for use in the ED.

A Quality Improvement Project was conducted to introduce HoD into a single UK ED in North West England, between January and March 2019. Following stakeholder consultation, the 9-item 'TAKE STOCK' tool was developed. Implementation of the tool increased the number of HoD (0—2.2 HoD episodes/week). Findings from the first PDSA cycle are presented, which revealed the key strengths and limitations of this model. Staff perceptions of the tool were evaluated using a self-administered short questionnaire designed by the authors. Satisfaction with 'TAKE STOCK' was assessed using ten-point numerical scales. Across respondents (n=15), average satisfaction scores exceeded nine out of ten concerning patient care, staff self-care, decision-making, education, teamwork and identification of equipment issues.

Implementation of HoD into the ED is feasible and viewed as beneficial by staff. Implementation toolkits for 'TAKE STOCK' have been requested by forty-two additional UK hospitals and ambulance trusts, demonstrating significant interest in its use. Research is now required to formally validate HoD frameworks for use in the ED, and assess whether HoD results in sustained improvements to staff and patient outcomes.

1 Introduction

2 ED staff frequently encounter significant events.¹ Examples include cardiac arrests and
3 traumatic, or unexpected deaths.²⁻⁴ These incidents negatively affect staff, giving rise to
4 moral injury or occupational burnout.³

5 Debriefing is a process which occurs in settings such as the military, emergency services
6 and aviation. In a range of clinical settings, including anaesthetics, obstetrics and oncology,
7 debriefing has been demonstrated to improve staff well-being, assist learning and reduce
8 risk of burnout.^{5, 6, 7} Specifically, hot debrief (HoD) describes a short, team-based discussion
9 immediately following an incident. HoD aims to address team wellbeing, highlight procedural
10 issues, and generate learning opportunities.⁸ Although psychological 'cold' debriefing (CoD)
11 is usually deferred until a later point, HoD provides the opportunity for team members to
12 immediately identify issues, share concerns, and highlight learning opportunities. HoD may
13 improve perceptions of negative experiences, facilitate 'emotional venting' and promote
14 wellbeing.⁹ Despite the potential benefits, HoD is not common practice in healthcare. A study
15 of Australian and New Zealand doctors and nurses¹¹ highlighted the perceived importance of
16 debriefing, yet few respondents reported awareness of specific guidelines or frameworks to
17 guide the process. A study undertaken in Canada found that debriefing occurred in less than
18 25% of significant events whilst a more recent UK study found that debriefing occurred in
19 only 26.1% of significant events, despite 88.8% of staff declaring interest in the debriefing
20 process.^{8, 12} The perceived benefits of HoD include education, improved teamwork, and
21 rapid identification of systematic errors.¹³ Whilst it is evident that barriers to debriefing exist,
22 including time-pressures, workload, and cultural perceptions,^{2,12} a simple tool to facilitate
23 HoD may overcome some of these barriers.

24 Tools to facilitate debriefing in the clinical setting do exist. One example is the DISCERN
25 tool, which provides a framework for the process of HoD.¹⁴ More recently the STOP5 tool
26 has been proposed for implementation in the ED setting.¹⁵ Additionally, other debriefing tools
27 such as PEARLS are helpful to facilitate CoD,¹⁶ however, may be too time-consuming for
28 regular use in the immediate aftermath of a significant event. Although there are differences
29 between existing tools (Table 1), all have common features, including the application of a
30 simple structure and use of a mnemonic. Mnemonics have the advantage of being easily
31 learnt and retained by clinicians, regardless of experience, making dissemination and
32 subsequent standardisation straightforward.¹⁷

Table 1: Comparison of characteristics of identified HoD Tools

Table 21: Comparison of characteristics of identified HoD Tools													
Tool Author (Date)	Characteristics of HoD Tool	Development and Validation	HoD Domains covered ¹									Method of Record Keeping	Notes
			Team Introduction	Welfare Check	Summarise Incident	Identify Positive Learning Points	Identify points for Improvement	Delegate Actions	Equipment Issues	Identify need for ongoing support/ CoD			
Country													
DISCERN Mullan et al (2013) US	<ul style="list-style-type: none">12-item checklistPaper based administration	<ul style="list-style-type: none">Retrospective observational cohort design. Observation of paediatric resuscitation (n=241 and debriefs (n=63), consensus based development, descriptive evaluation. ¹⁴	/	+	-	+	+	-	-	+	Formal Record Sheet	Pro-forma asks for introductions by role, but not name Not evaluated outside of paediatric resuscitation	
PEARLS Bajaj et al (2017) US	<ul style="list-style-type: none">Five-item guidelinePoster, electronic guideline and pocket card	<ul style="list-style-type: none">Literature review, consensus based/ expert design, and iterative evaluation.¹⁶	-	/	+	/	/	/	-	-	No formal record identified	Not evaluated outside of simulated scenarios.	
STOP5 Walker et al (2018) UK	<ul style="list-style-type: none">Four - Item ChecklistPaper based administration	<ul style="list-style-type: none">Literature review, local stakeholder meeting, consensus based design, evaluation using simulation¹⁵	+	+	+	+	+	+	/	/	Formal Record Sheet	Need for CoD identified on data collection sheet, but not explicitly within STOP5 mnemonic.	

¹ **Notes** ¹compared to those featuring within *TAKESTOCK* framework ; Legend: + = Explicitly Present; /= Partially or implicitly present; -= Not Present.

Taking into account existing available tools, this project aimed to develop and introduce a HoD process unique to the needs of a single ED in the North-West of England.

Methods

Stakeholder Analysis

A Quality Improvement Project (QIP) was designed following SQUIRE 2.0 guidelines. This was as part of an academic module undertaken by the lead author (MS), during an intercalated BSc in Urgent & Emergency Care.¹⁸ During this programme, MS spent nine months embedded within an ED, supported by consultant emergency physician mentors (JM and SL) and faculty including an academic emergency physician (BG) and associate professor of education (PN). Ethical approval was not required although the project was registered as a service evaluation with the host institution (Ref: 104918/19).

A personal reflection on a significant event led the lead author to identify a lack of HoD within their practice setting. In an attempt to confirm the problem locally, a retrospective audit of significant incidents was conducted through December 2018, to examine the incidence of documented debriefing. Additionally, a 10-item questionnaire exploring experiences and perceptions of HoD was distributed to a convenience sample of medical, nursing and ancillary staff (n=18) (Supplementary Material 1). Analysis of the questionnaire was planned to include basic descriptive statistics and identification of key messages derived from free-text responses.

Gaining engagement from 'high interest- high power' stakeholders may help increase the likelihood of successful and sustainable change resulting from a QIP. This was accomplished within the study setting by constructing a stakeholder power grid (Figure 1).¹⁹ As a result, two senior physicians and three senior nursing staff were also consulted and individually invited to share their opinions on implementation, facilitators and barriers of a standardised HoD process. An external police representative was consulted, based on their experience of running HoD in the field. In addition, the author of a separate HoD Tool, 'STOP5', was also consulted as a subject matter expert.¹⁵ To confirm wider agreement within the ED, findings from the stakeholder process were presented at a departmental governance meeting.

Derivation of TAKE STOCK

The structure and content of existing debrief tools were evaluated by the authors at the outset of the project. It was noted that existing tools, including STOP5, appeared to have good face validity, were user- friendly and broadly relevant. However, additional items

relating to equipment issues, the welfare needs of staff including the need for rest breaks, and the need for a subsequent CoD, were identified as a result of the initial stakeholder questionnaire and discussions with 'high interest- high power' stakeholders. As these items did not explicitly feature within any existing identified HoD tool yet were deemed essential to local requirements, TAKE STOCK was proposed as a novel HoD structure. The 'TAKE STOCK' HoD process (Box 1) follows a logical progression starting with team introductions. It progresses to explore team welfare, equipment issues/failures, incident evolution and subsequent action points. The HoD is completed alongside a record sheet, which is stored securely to facilitate subsequent CoD, ongoing audit and quality assurance (Supplementary Material 2).

The 'TAKE STOCK' tool was subsequently trialled following a difficult resuscitation by the lead author to confirm usability prior to initial implementation.

Box 1: The 'TAKE STOCK' hot debrief process

1. Team gathers away from critical incident location
2. Facilitator takes an instruction sheet and scribe is allocated to fill in record sheet
3. Facilitator runs through 'TAKE STOCK' tool
4. Completed record sheets placed in locked box in resus department
5. Sheets are collected monthly stored securely
6. Paper copies then disposed of as per trust data protection policy
7. If cold debrief is required, those recorded as present are individually invited by email
8. QI lead reviews data collection forms monthly to ensure any issues are addressed or reported if necessary

Planning and Outcome Measures

The project was operationalised using Plan-Do-Study-Act (PDSA) methodology, commonly used to guide healthcare QI process. The finalised TAKESTOCK poster (Figure 2) was placed in the clinical area, to prompt use following staff request or pre-defined significant incidents.

Measured outcomes included the absolute number of HoD occurring above baseline, number of staff present during HoD, duration of HoD, and grade of the facilitator. Staff perceptions and satisfaction with TAKESTOCK was assessed using a self-reported questionnaire which was issued retrospectively by the lead author to HoD participants. This explored global satisfaction and perceptions of HoD in relation to teamwork, well-being,

educational value, identification of equipment issues and personal well-being or skills development.

A description of key findings from the stakeholder analysis and initial PDSA cycle, conducted between January and February 2019, are presented.

Results

Stakeholder analysis

Retrospective case note review of 21 deaths identified during December 2018 revealed that only a single debrief was documented. A total of 17/18 questionnaires were returned as part of the initial stakeholder analysis (response rate=94%), and included nurses (n=9, 52.9%), physicians (n=5, 29.5%) and students (n=3, 17.6%). Of these, 16 respondents (89%) had never participated in a HoD, despite 100% recalling at least one incident where they perceived HoD would have been useful. Of the two respondents who reported participation in HoD previously, neither reported use of a formalised process. Perceived barriers included time pressures (n=16, 89%), HoD not part of current culture (n=7, 38%), lack of staff awareness of HoD process (n=2, 11%), and reluctance due to perceived emotional sensitivity of events (n=2, 11%) (Quotes 1 & 2, below). Discussions with 'high interest- high power' stakeholders broadly confirmed these findings. In addition, senior stakeholders suggested practical recommendations for implementing and sustaining the project, such as including HoD within simulation scenarios (Quote 3).

"Staff members may not want to talk straight away, therefore we need to make time to debrief regularly and acknowledge the benefits"

Quote 1: Senior Sister

"[Lack of] time, this is a busy department and the next patient is always waiting"

Quote 2: Consultant Emergency Physician

"To help staff become more familiar and comfortable, [I would] recommend using the tool at the end of teaching simulation scenarios"

Quote 3: Consultant Emergency Physician

Initial PDSA cycle

The first PDSA cycle comprised introduction of the tool into the ED. A run chart was used to monitor progress. Over the six-week study period, 13 HoDs took place (average 2.2/ week)

1 with an average of 9.7 staff members per debrief episode. Where start and stop times were
2 provided (4/13, 30.7%), average duration of HoD was 8 minutes. The debrief facilitator
3 included consultant physicians (8 HoDs), non- consultant physicians (4 HoDs) and the
4 project lead, a medical student (1 HoD).

5 Evaluation questionnaires were distributed following the initial implementation
6 (Supplementary Material 1). A total of 15 participants responded and rated the following
7 indicators on a ten-point ordinal scale; immediate identification of equipment issues (average
8 rating= 9.6/10), promoting a culture of teamwork (9.4/10), wellbeing (9.6/10), and education
9 (9.9/10). All participants reported that HoD should become part of standard practice.

10 Free text comments within the questionnaires provided deeper insight into staff perceptions
11 of the potential effectiveness of the tool, which related to patient care, self-care, decision-
12 making, professional education, and teamwork (Quotes 4,5 and 6, below).

13 *“This could make the difference between somebody coping well at work, or leaving*
14 *work because they can’t cope”*

15 Quote 4: Senior Nurse

16 *“It gives the opportunity for questions to be answered for those who were unsure of*
17 *why some decisions were made. It is useful for the welfare of all staff, not just junior*
18 *members”*

19 Quote 5: Consultant Emergency Physician

20 During the first PDSA cycle, the ‘study’ component revealed some useful points for further
21 improvement, including increasing the fluency of information flow during the debrief,
22 increasing individuals’ accountability for actions identified during debrief, and to encourage
23 the delivery of constructive feedback as opposed to attribution of blame.

24 *“The data collection sheets should be altered to more clearly record who is*
25 *responsible for actioning any issues found”*

26 Quote 6: Consultant Emergency Physician

27 As a result of this, the ‘Act’ component of the initial evaluation included re-structuring of the
28 debrief guide and data collection sheet, including a field to name individuals assigned to
29 complete actions resulting from debrief, and a point emphasising the importance of ‘no
30 blame’ culture as part of the debrief guide. These changes were subsequently implemented
31 on Week six of the study (see Run Chart— Figure 3).

1 Discussion

2 The 'TAKE STOCK' HoD tool facilitates standardised and structured HoD within the ED and
3 has increased frequency of HoD in one centre. Whilst further evaluation is needed to confirm
4 benefits, and reliably generalise to other settings, when taken at face value, 'TAKE STOCK'
5 is amenable to adoption in other settings. To this end, an implementation toolkit, obtained by
6 contacting the lead author, has been developed to support dissemination. To date, a further
7 forty-two EDs and ambulance trusts across the UK have obtained the toolkit, distributed
8 under a Creative Commons agreement (<http://www.creativecommons.org>). Anecdotal
9 feedback from early adopters is very positive, and formal feedback now planned to aid
10 onward development.

11 Key lessons learned by the authors so far that may be relevant for providers or institutions
12 wishing to implement their own hot debriefing processes are highlighted in **Box 2**.

Box 2: Key lessons learned for implementing hot debriefing based on the experience with TAKE STOCK.

Do...

- **...be inclusive.** Shared design and ownership of the tool amongst all stakeholders increases acceptance and sustainability of change from the outset.
- **...think beyond your tribe.** Are there others (pre- hospital staff, receptionists, domestic staff) who would benefit from being part of the process?
- **...evaluate.** Hot debrief processes should be continuously audited and improved,

Don't ...

- **...be overly formulaic.** Mnemonics and guidelines can provide useful structure, but it is sometimes desirable to deviate if the situation requires.
- **...get easily disheartened.** If hot debrief is a new concept, not all may be comfortable with implementation at the outset. 'Diffusion of innovation' theory suggests that change is likely to increase over time.
- **...defer!** HoD can save time and emotional energy in the longer term—make the effort after a significant event rather than deferring. Allowing a few minutes after a difficult case for HoD may help staff to more effectively focus on the next task.

13

14 Sustainability

15 The TAKE STOCK HoD process continues to be used in the study centre. Since completion
16 of the initial PDSA cycle, seventeen additional debriefs have been completed, with the

presenting complaint of the associated clinical case documented in eleven of these (64.7%). However, it is noted that the overall frequency of HoD has decreased to about one event per month (Figure 4). Proposed explanations for the reduced uptake since introduction may include new staff turnover resulting in decreased awareness of the tool and practical difficulties conducting debrief in the context of recent major changes to working practices. These include social distancing and the routine use of masks and personal protective equipment imposed by the COVID-19 pandemic. Nonetheless, TAKE STOCK continues to be used for the highest impact significant events which have included maternal death, traumatic and paediatric cardiac arrest.

To ensure TAKE STOCK continues to be utilised optimally, a subsequent PDSA cycle is planned, which will aim to recruit new process champions, determine the optimum frequency of debriefing, improve ease of documentation, and address challenges occurring because of recent adjustments to working because of COVID-19.

Limitations

Due to under-reporting within clinical records, the initial audit may have failed to capture the extent of debriefing before the design and implementation of TAKE STOCK. However, staff responses also obtained at the outset of the project confirmed the presence of a problem. Furthermore, positive staff engagement with the implementation of TAKE STOCK, and subsequent continuation of its use, indicates that an important need has been addressed. As this report only concerns the initial PDSA cycle, current evaluation data is limited which means that conclusions must be considered cautiously. Ensuring longer term sustainability is a critically important aspect of quality improvement yet is frequently overlooked.²⁰ In this case, the project was led by a student and implementation of subsequent PDSA cycles was hindered by the transient nature of their placement. Quality improvement work in the ED may frequently be initiated by staff on time-limited attachments, and in such cases handover and delegation of onward work should be considered an essential component of the sustainability plan from the outset. Nonetheless, a subsequent PDSA cycle is now planned, and it is acknowledged that the tool may further evolve to meet the needs of clinicians. To gain in-depth views of stakeholders, some qualitative data was collected in the form of free-text responses within questionnaires. However, the limited nature of this data precluded a formal thematic analysis.

As already identified, multiple hot debrief tools do exist. Scientific evidence underpinning the use of HoD tools, including confirmation of desirable and beneficial characteristics, is

currently lacking, and in many cases is restricted to anecdotal data. Although it is appreciated that providers may wish to adapt and produce their bespoke HoD solutions, formal comparative analysis of existing tools would be beneficial to assess usability and face validity amongst end-users, as well as confirm benefits for staff wellbeing, patient safety and clinical outcomes.

Conclusion

Introduction of HoD in the ED may enhance staff wellbeing, improve teamwork and generate increased learning from incidents. Each of these factors has the potential to improve patient care. The introduction of standardised approaches such as 'TAKE STOCK' may empower providers to initiate debriefing, helping ensure that that HoD becomes embedded in practice.

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Competing Interests

Max Sugarman was awarded the 2019 Royal College of Emergency Medicine Undergraduate Prize for this work.

Acknowledgements

We would like to thank Dr Craig Walker and colleagues for his advice and allowing adaptation of the STOP5 tool. We would also like to thank Megan Sugarman for assisting with data collection.