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Restrictive Interventions in Victorian Emergency Departments: A Study of Current Clinical Practice.

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JK, MG and CD conceived the study and it was undertaken with the assistance of the site investigators AG, BM, BB and PC. SD managed the data collection and collation. JK undertook the analysis. All authors contributed to the writing of the manuscript.

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Objective: The aim was to determine current clinical practices for managing behavioural emergencies within Victorian public hospital EDs.

Methods: A multicentre retrospective study involving all patients who attended ED in 2016 at the Alfred, Ballarat, Dandenong, Geelong and Royal Melbourne Hospitals. The primary outcome was the rate of patient presentations with at least one restrictive intervention. Secondary outcomes included the rate of security calls for unarmed threats (Code Grey), legal status under the Mental Health Act at both the time of ED arrival and the restrictive intervention, and intervention details. For each site, data on 100 patients who had a restrictive intervention were randomly extracted for indication and methods of restraint.

Results: In 2016, 327 454 patients presented to the five EDs; the Code Grey rate was 1.49% (95%CI: 1.45-1.54). Within the Code Grey population, 942 had at least one restrictive intervention (24.3%, 95%CI: 23.0-25.7). Details were extracted on 494 patients. The majority (62.8%, 95%CI: 58.4-67.1)) were restrained under a Duty of Care. Physical restraint was used for 165 (33.4%, 95%CI: 29.3-37.8) patients, 296 were mechanically restrained (59.9%, 95%CI: 55.4-64.3), median mechanical restraint time 180 minutes IQR: 75-360), and 388 chemically restrained (78.5%, 95%CI: 74.6-82.0).

Conclusions: Restrictive interventions in the ED largely occurred under a Duty of Care. Care of patients managed under legislation that covers assessment and treatment of mental illness has a strong clinical governance framework and focus on minimising restrictive interventions. However, this is not applied to the majority of patients who experience restraint in Victorian EDs.

Key Words

Behavioural Emergencies, Duty of Care, Emergency Department, Restrictive Intervention, Mechanical Restraint, Physical Restraint, Chemical Sedation.

Introduction

Emergency Departments (EDs) are volatile, busy, environments in which caring for aggressive or agitated patients is common.[1, 2] The challenge for health care professionals is to de-escalate patients who pose a risk of harm to themselves or others.[3] When a patient presenting to the ED with a behavioural emergency threatens to harm themselves, others or property, a Code Grey may be initiated. A Code Grey is a hospital-wide, clinically led response to an unarmed threat, and involves both clinical and security staff.[4, 5] Staff use verbal de-escalation techniques and may prescribe oral medication where possible. If de-escalation fails, and the situation is unsafe, restrictive interventions are often used to ensure patient and staff safety.[6] Restrictive interventions are not employed in Victorian EDs without a Code Grey being called first.

Restrictive interventions are used in EDs to mitigate the risk of harm. This is achieved through coercive means and limits a person's freedom and autonomy. Interventions may involve the use of physical restraint where a team of clinical and security staff physically hold the patient down, apply mechanical restraints (such as wrist and ankle restraints, trays, ties or buckles), or administer chemical sedation (medication to subdue a patient).[4]

Concerns have been raised regarding the potential for restrictive interventions to invoke physical and psychological trauma associated with restraint, and loss of autonomy.[6, 7] There is tension between ensuring patients have the right to their own decision-making versus health professionals' responsibility to ensure patients do not suffer harm. There are additional responsibilities of healthcare organisations to ensure staff work in a safe environment and other patients and visitors are safe. ED staff are often confronted with circumstances whereby the patient may not be known, background information is scant (particularly medical co-morbidities and recent drug or alcohol ingestion), and the decision-making capacity of the person is unclear.

In Victoria, Australia, the use of restrictive interventions for patients cared for under the Mental Health Act (MHA 2014)[8] is governed by the MHA itself. There are important provisions within the Act to allow care to be provided to patients without their consent:

- Section 351 (s351) allows police to apprehend a person if they believe the person to have a mental illness and to prevent serious and imminent harm to that person or to others. As soon as practicable the person must be transferred to a medical or mental health practitioner for assessment.
- An Assessment Order is made by a registered medical or mental health practitioner and enables a person to be compulsorily taken to, or detained in, a designated mental health service to be examined there by an authorised psychiatrist. An Assessment Order lasts 24 hours.
- A Treatment Order is made by an authorised psychiatrist. A temporary Treatment Order may remain in force for 28 days.

However, in acute care settings (including EDs), many patients are managed under a Duty of Care (DOC). A DOC is an ethical and legal obligation to provide reasonable emergency care to a person. The obligation persists even if the person lacks decision-making capacity.[9] A DOC is especially important in the ED where, for reasons of severe intoxication, mental illness, trauma or medical illness, a person is unable to provide consent for their care, and has need for urgent interventions. Unlike the MHA, there is no over-arching governance for patients managed under a DOC. To date there has been little published on the use of restrictive interventions in this setting.[1, 2]

The aim of this study was to determine current clinical practices for managing patients with behavioural emergencies, within Victorian public hospital EDs. This included the rate of restrictive interventions, the rate of Code Greys, the legal status of patients under the MHA at the time of arrival in the ED and at the time of intervention, and the nature and duration of the restrictive interventions.

Methods

Research design

This was a multi-centre, retrospective observational study.

Study Setting

Five EDs within Victoria were chosen to provide a cross-section of acute hospital settings. These sites were selected because of previous collaborations[1, 10] and to provide metropolitan and regional representation. All sites provide occupational violence and aggression management staff training. In Victoria, restrictive interventions are always preceded by a Code Grey.

The Alfred Emergency & Trauma Centre is a Level 4,[11] adult-only, tertiary trauma and referral centre located east of Melbourne's central business district. Ballarat Hospital is the largest regional hospital in the Grampians, in Victoria's west. Dandenong Hospital is a Level 3,[11] major metropolitan hospital, located 35km southeast of the city centre. University Hospital Geelong is Victoria's largest regional hospital, 75km southwest of Melbourne. The Royal Melbourne Hospital is a Level 4,[11] adult only, tertiary trauma and referral centre located west of Melbourne's central business district.

Participants

All patients who presented to the ED from January 1st 2016 to December 31st 2016 were included.

Outcome measures

The primary outcome measure was the rate of patient presentations with at least one restrictive intervention. As restrictive interventions are not routinely collected, this was determined as the restrictive intervention rate within the population who had a Code Grey called.

Secondary outcome measures included the Code Grey rate, the MHA status at the time of arrival in ED and at the time of the intervention, and the nature and duration of the restrictive interventions.

Data Collection

All ED presentation data for 2016 was obtained from the clinical information systems of the five hospitals.

In addition, each hospital provided data related to ED Code Grey events. These datasets were not homogenous as there is no standardised collection of Code Grey data. Three sites managed their Code Grey database through security officers logging data. Two sites utilised the hospitals' incident reporting system, Riskman™,[12] with data logged in by clinical staff. Data from these systems was obtained by the site investigator at each hospital and collated by one investigator (SD). The datasets recorded those patients who had had a Code Grey but generally little was recorded about what occurred or the surrounding circumstances.

The ED presentation Code Grey data sets were merged using patient hospital numbers.

For each site, patients who triggered a Code Grey were randomly selected using a random number generator. The medical records were checked manually to see whether a restrictive intervention had occurred during the Code Grey. This process was planned to continue until 100 patients were identified at each site. The exception was at Ballarat Hospital where a total of 106 Code Greys were recorded and all were included.

For those patients randomly selected, the medical record was reviewed to identify all restrictive interventions, the timing and duration of interventions and the MHA status at the times of arrival and the first restrictive intervention. All data needed to be explicitly recorded in the medical records to be included.

Sample Size

All patients who presented in 2016 were included to avoid seasonal variability. It was anticipated that 300 000 patient presentations to the five EDs would occur. Given the

expected Code Grey rate is 1.5%,[10, 13] this results in 4 500 patients with at least one Code Grey. If the rate of restrictive interventions during a Code Grey is assumed to be 30%, a sample of 419 patients was required to demonstrate a 10% variance (alpha = 0.05, power =0.9). The random sampling of 100 patients from each site would provide 500 patients.

Data Analysis

All data were analysed descriptively. Confidence intervals were set at 95%. Proportions were statistically assessed using the Chi-square tests and continuous variables with ANOVA for normally distributed values and Kruskal-Wallis for non-parametric variables. A p-value <0.05 was defined to be statistically significant.

Ethical Considerations

This project had ethics approval from all five hospitals' ethics and research committees.

Results

In 2016, the five sites had 327 454 ED presentations.

Table 1 shows details regarding patient demographics, ED arrival and disposition.

Patients who had a Code Grey

Table 2 shows details regarding patients who had a Code Grey in comparison to those who did not. The Code Grey data was incomplete for one site and was excluded. For the remaining four sites there were 259 031 presentations and 3 871 patients with at least one Code Grey recorded (1.49%, 95%CI: 1.45-1.54). There were 682 patients (17.6%, 95%CI: 16.4-18.9) who had more than one Code Grey during a single presentation (range 2-14) resulting in a total 4 841 Code Greys.

Patients who had a Code Grey were significantly more likely to be male, and younger, than those who did not have a Code called. A higher proportion of patients with a Code Grey were admitted to an observation or mental health ward.

Patients who had a restrictive intervention

For those patients who had a Code Grey, 942 (24.3%, 95%CI: 23.0-25.7) had at least one restrictive intervention. Based on the Code Grey rate for ED presentations and the restrictive intervention rate within that population, it is estimated the overall restrictive intervention rate is 0.36% (95%CI: 0.33-0.40) or nearly 4 patients per 1000 ED presentations

Table 3 shows the details of the 494 patients who had at least one restrictive intervention and were randomly selected for manual review of their medical records. Detailed data extraction was planned for 100 patients at each site, except one site where all 106 Code Greys were being included. However, due to issues with data reconciliation, two to three patients were lost from each site, leading to a decrease from a potential total of 506 to 494.

Only 31 patients (6.3%) restrained in the ED arrived on a MHA assessment or treatment order. Most patients restrained were either not under the MHA when they arrived or were brought in by the police under s351 (which is covered by the MHA). At the time of restraint, nearly two thirds were managed under a DOC. Between arrival to the ED and the first restraint, the number of patients on an assessment order or a treatment order increased from 31 (6.3%) to 118 (23.9%).

Although a restrictive intervention was used in all these patients, only one in six were subsequently admitted to a mental health ward. Most went home, to an observation ward or to a general medical ward.

Discussion

This is the first Australasian study to provide a detailed review of restrictive interventions in an acute setting generally and an ED population specifically. Restrictive interventions are occurring for nearly four patients in every 1000 presentations with nearly one quarter of those patients for whom a Code Grey called managed with a restrictive intervention. The legal basis for the majority of cases appeared to be DOC, and not within the framework of the MHA. These results indicate an urgent need to refine frameworks for the governance of restrictive interventions in acute settings.

Results of this study are consistent with current international and national trends show high rates of acute behavioural disturbance occurring in EDs.[15, 16] This provides an impetus to ensure a safe environment for all patients and staff, whilst reducing restrictive practices, wherever possible, to mitigate medicolegal risk regarding occupational and patient safety.[17] Studies suggest that restrictive interventions influence future health seeking behaviour and may lead to ED avoidance by patients with ongoing health issues.[18, 19]

The majority of patients who received a restrictive intervention were subsequently admitted to an observation ward or sent home from the ED; less than one sixth were admitted to a mental health ward. This suggests a substantial proportion of patients brought to the ED and subsequently restrained had an acute healthcare issue that did not require prolonged hospitalisation and presents an opportunity to avoid ED presentations. The Police, Ambulance, and Community Early Response program (PACER) is an example of a targeted intervention to divert patients with behavioural issues in the community who do not require ED care. Community assessment occurs in tandem by mental health clinicians and police with clinical needs are addressed on the spot including referral to community follow up or hospital admission.[20] Further research should be undertaken to look at the effectiveness of these diversion programs, why some patients are managed in the community and others brought to the ED by police, and the outcomes of the patients involved.

Aggression and agitation were the main reasons recorded for restrictive interventions. ED staff members are exposed to this high level of occupational violence. Current programs to reduce this risk include a WorkSafe campaign to raise public awareness,[21] funding to improve ED and hospital security,[22] and reviews of security arrangements and staff training.[23, 24] The ED environment may be adapted to decrease the risk to staff and patients due to clinically related aggression. For those patients who will be sent home or to an observation unit, modification of the typical short-stay model to better manage patients with behavioural concerns would allow transfer to a less acute environment than the ED, ideally with resources better suited to managing this population. A six bed Behavioural Assessment Unit (BAU) was developed at Royal Melbourne hospital. Evaluation showed improved care by staff with a decrease in ED length of stay, decreased time to be seen by a doctor and a decrease in Code Greys, restrictive interventions, and time in restraint.[25]

Limitations

Accurate reporting of Code Grey rates depends on adequate, standardised data collection. A Code Grey is not an Australian Standard and many jurisdictions do not require an emergency response for an unarmed threat.[26] Victoria has developed "Code Grey" as a State-wide standard but this was only introduced in 2015.[5] It may not have been formally introduced in all healthcare organisations when data was obtained for this study.

The five sites may not be representative of other jurisdictions. However, the breadth of coverage across Victoria is likely to be indicative of such activity at least within the State for those healthcare organisations that have an ED.

Patients who had restrictive interventions were first identified by selecting the population for whom a Code Grey was called. Whilst it is possible that patients might be restrained without a Code Grey being called first, this is extremely unlikely given the potential risk of harm to staff and patients. In the experience of the study's authors, a Code Grey (or other institutional equivalent) is always called prior to the use of restrictive interventions.

All five sites had differing systems for recording Code Greys and restrictive interventions. Documentation varies with four sites using paper–based forms, only two sites required documentation of monitoring and one site did not require a rationale for the restrictive intervention. Intensive resources were required to extract data manually in order to answer relatively straightforward queries regarding Code Greys, restrictive interventions and surrounding circumstances. Manual extraction may result in subjective interpretation, especially where clinical procedures are poorly defined or recorded.

Recommendation for clinical practice

A framework for the governance of restrictive interventions in acute settings must be developed. It should apply consistently to all patients, not just a proportion managed under Mental Health legislation. The framework should consider consumer, organisational and staff perspectives. It would include continuous quality improvement and focus on minimising the rates of restrictive interventions whilst maintaining a safe environment for patients, staff, and visitors.

The use of restrictive interventions should be clearly documented using a standardised template to allow ready documentation and data extraction. With the move of all healthcare facilities to electronic medical records, consideration should be given to the benefit of common definitions and minimum datasets.

Interventions should be a component of a program of recovery-orientated, trauma-informed care.[27] Difficult and challenging behaviour should be managed in ways that shows decency, humanity and respect for individual rights, while effectively managing risk. Restrictive interventions should be used as a last resort and for the briefest duration, after other options have been tried or considered and found to be unsuitable in the circumstances.[14]

Models of care should be developed that emphasise low stimulus, high resource environments that combine acute and mental health care. Models based on short-stay units but with additional high acuity nursing and inclusion of mental health and drug and alcohol staff have been developed and evaluated.[25]

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Table 1: Patient details, by site

	Alfred	Ballarat	Dandenong	Geelong	Royal Melbourne	Total
Presentations	63 724	53 831	69 910	68 423	71 566	327 454
Age (years) - median (IQR)*	44 (29-64)	33 (17-56)	39 (23-61)	37 (18-61)	44 (28-65)	40 (24-62)
Sex – n (%)						
Male	34 915 (54.8)	27 455 (51.0)	35 933 (51.4)	34 459 (50.4)	37 813 (52.8)	143 120 (52.3)
Female	28 807 (45.2)	26 370 (49.0)	33 977 (48.6)	33 961 (49.6)	33 744 (47.2)	130 489 (47.7)
Other~	2 (0.0)	6 (0.0)	0 (0.0)	3 (0.0)	9 (0.0)	14 (0.0)
Triage category – n (%)^						
1	616 (1.0)	274 (0.5)	271 (0.4)	488 (0.7)	917 (1.3)	2 566 (0.8)
2	8 809 (13.8)	6 358 (11.8)	9 198 (13.2)	10 040 (14.7)	7 532 (10.5)	41 937 (12.8)
3	25 551 (40.1)	18 911 (35.1)	29 205 (41.8)	25 434 (37.2)	32 707 (45.7)	131 808 (40.3)
4	24 365 (38.2)	24 389 (45.3)	25 920 (37.1)	26 557 (38.8)	26 612 (37.2)	127 843 (39.0)
5	4 381 (6.9)	3 899 (7.2)	5 314 (7.6)	5 899 (8.6)	3 797 (5.3)	23 290 (7.1)
Other#	2 (0.0)	0 (0.0)	2 (0.0)	5 (0.0)	1 (0.0)	10 (0.0)
Mode of arrival – n (%)						
Self	41 396 (65.0)	42 586 (79.1)	na	47 183 (69.0)	45 981 (64.3)	177 146 (68.8)
Ambulance	21 779 (34.2)	10 929 (20.3)	na	20 751 (30.3)	24 623 (34.4)	78 082 (30.3)
Police	549 (0.9)	306 (0.6)	na	470 (0.7)	580 (0.8)	1 905 (0.7)
Other#	0 (0.0)	10 (0.0)	na	19 (0.0)	382 (0.5)	411 (0.2)
Disposition – n (%)∞						
Home	23 097 (36.3)	35 343 (65.7)	32 991 (47.2)	36 672 (53.6)	31 188 (43.6)	159 291 (48.7)
Observation medicine	20 073 (31.5)	4 192 (7.8)	19 306 (27.6)	6 222 (9.1)	15 009 (21.0)	58 580 (17.9)
General ward	15 033 (23.6)	9 244 (17.2)	11 274 (16.1)	23 371 (34.2)	17 839 (24.9)	76 381 (23.3)

Critical Care	2 282	(3.6)	664	(1.2)	1 443	(2.1)	884	(1.3)	2 477	(3.5)	7 204	(2.2)
Inter-hospital transfer	222	(0.4)	406	(0.8)	526	(0.8)	726	(1.1)	1 270	(1.8)	3 150	(1.0)
Mental Health ward	401	(0.6)	197	(0.4)	739	(1.1)	538	(0.8)	575	(0.8)	1 948	(0.6)
Left at own risk	2 757	(4.3)	4 109	(7.6)	3 985	(5.7)	4 907	(7.2)	4343	(6.1)	20 101	(6.1)
DIED	63	(0.1)	22	(0.0)	60	(0.1)	57	(0.1)	69	(0.1)	271	(0.1)
LOS[≠] – median (IQR)	181	(111-238)	184	(107-300)	177	(113-236)	202	(123-312)	206	(127-324)	190	116-281

*IQR=Inter-quartile range. ~other=intersex or indeterminate. ^Australasian triage scale. #Other=not specified in medical notes. ∞Disposition notes – Home includes usual residential care, Observation medicine includes short-stay and behavioural admission units, Critical Care includes coronary care, intensive care, catheter lab and direct to theatre, DIED=Died within the ED and dead on arrival. [≠]Minutes. na=not available

Table 2: Details of patients who had a Code Grey called

	Code Grey called			Code Grey not called			
	n=3 871[#]			n=255 160[β]			p-value[μ]
Age (years) - median (IQR)*	36		(27-44)	41		(25-62)	<0.001
	n	%	(95%CI)	n	%	(95%CI)	
Gender~							<0.001
Male	2 219	57.3	(55.8-58.9)	106 442	52.8	(52.6-53.1)	
Female	1 556	40.2	(38.7-41.8)	94 972	47.2	(46.9-47.4)	
Other^	0	0.0	(0.0-0.1)	11	0.0	(0.0-0.0)	
Discharge Category							<0.001
Mental Health	2 274	58.7	(57.2-60.3)	8 111	3.2	(3.1-3.3)	
Toxicology	777	20.1	(18.8-21.4)	4 569	1.8	(1.7-1.8)	
Trauma	307	7.9	(7.1-8.8)	39 530	15.5	(15.4-15.6)	
Other	436	11.3	(10.3-12.3)	198 192	77.7	(77.5-77.8)	
Unknown	77	2.0	(1.6-2.5)	4 758	1.9	(1.8-1.9)	
Disposition[∞]							<0.001
Home	1 074	27.7	(26.3-29.2)	121 545	47.6	(47.4-47.8)	
Observation Medicine	1 235	31.9	(30.4-33.4)	57 345	22.5	(22.3-22.6)	
Mental Health ward	649	16.8	(15.6-18.0)	1 263	0.5	(0.5-0.5)	
General ward	443	11.4	(10.5-12.5)	50 523	19.8	(19.7-20.0)	
Left at own risk	297	7.7	(6.9-8.6)	14 897	5.8	(5.8-5.9)	
Critical Care	75	1.9	(1.5-2.4)	6 791	2.7	(2.7-2.7)	
Correctional facility	59	1.5	(1.2-2.0)	197	0.1	(0.1-0.1)	
Inter-hospital transfer	39	1.0	(0.7-1.4)	2 385	0.9	(0.9-1.0)	
DIED	0	0.0	(0.0-0.1)	214	0.1	(0.1-0.1)	

[#]n=3 871 for the number of unique presentations, not the total number of codes that occurred during those presentations. [β] n=255 160 as only four sites had complete Code Grey datasets. *IQR=Inter-quartile range. ~Gender=only three sites with linked data ^Other=intersex or indeterminate. ∞Disposition notes – Home includes usual residential care, Observation medicine includes short-stay and behavioural admission units, Critical Care includes coronary care, intensive care, catheter lab and direct to theatre, DIED=Died within the ED and dead on arrival. [μ]P-value for comparison with entire ED population who did not have a Code Grey.

Table 3: Randomised sample of patients who had a restrictive intervention

	n=494		
Age (years) - median (IQR)*	36		(27-45)
	n	%	(95%CI)
Gender~			
Male	256	64.1	(59.2-68.8)
Female	143	35.8	(31.2-40.8)
Other^	0	0.0	(0.0-1.2)
Physical restraint	165	33.4	(29.3-37.8)
Mechanical restraint	296	59.9	(55.4-64.3)
Duration - median (IQR)#	180		(75-360)
Chemical restraint	388	78.5	(74.6-82.0)
MHA status on arrival			
No Status∞	147	29.7	(25.8-34.0)
Section 351	254	51.4	46.9-55.9)
Assessment order	11	2.2	(1.2-4.1)
Treatment order	20	4.1	(2.6-6.3)
Unknown	62	12.6	(9.8-15.9)
MHA status at 1st restrictive intervention			
Duty of Care	311	63.0	(58.5-67.2
Assessment order	108	21.9	(18.4-25.8
Treatment order	10	2.0	(1.0-3.8)
Unknown	65	13.2	(10.4-16.5)
Reason for restraint≠			
Aggression / Agitation	371	75.1	(71.0-78.8)
Risk of harm to self or others	218	44.1	(39.7-48.6)
Risk of absconding	140	28.3	(24.5-32.6)
Attempting to self-harm	110	22.3	(18.7-26.3)
Refusal of medication	101	20.5	(17.0-24.3)
Damaging property	36	7.3	(5.2-10.0)
Trauma care	8	1.6	(0.8-3.3)
Unknown	19	3.9	(2.4-6.1)
Discharge diagnosis category			
Mental Health	265	53.6	(49.1-58.1)
Toxicology	125	25.3	(21.6-29.4)
Trauma	42	8.5	(6.3-11.4)
Other	58	11.7	(9.1-15.0)
Unknown	4	0.8	(0.3-2.2)
Disposition£			
Home	139	28.1	(24.3-32.4)
Observation medicine	112	22.7	(19.1-26.7)
General ward	103	20.9	(17.4-24.8)
Mental Health ward	81	16.4	(13.3-20.0)
Critical Care	13	2.6	(1.5-4.6)
Correctional facility	10	2.0	(1.0-3.8)
Inter-hospital transfer	5	1.0	(0.4-2.5)
Left at own risk	31	6.3	(4.4-8.9)

*IQR=interquartile range. ˜only four sites with available data (n=399). ^Other=intersex or indeterminate. #Duration in minutes of restrictive intervention. ∝No status under the MHA indicates that the Act was not being applied. Patients had presented voluntarily. ≠More than 1 reason per restrictive intervention might be recorded. £Disposition notes – Home includes usual residential care, Observation medicine includes short-stay and behavioural admission units, Critical Care includes coronary care, intensive care, catheter lab and direct to theatre.

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