

FACTUAL MEMORIES OF ICU: RECALL AT two YEARS POST  
DISCHARGE AND COMPARISON WITH DELIRIUM STATUS DURING ICU  
ADMISSION. A multicentre cohort study

**Abstract**

Aims and objectives: To examine the relationship between observed delirium in ICU and patients' recall of factual events up to two years after discharge.

Background: People, the environment, and procedures are frequently cited memories of actual events encountered in ICU. These are often perceived as stressors to the patients and the presence of several such stressors has been associated with the development of reduced health related quality of life or post-traumatic-stress-syndrome (PTSD).

Design: Prospective cohort study using interview technique.

Method: The cohort was assembled from 152 patients who participated in a previously conducted multi-centre study of delirium incidence in Australian ICUs. The interviews involved a mixture of closed- and open-ended questions. Qualitative responses regarding factual memories were analysed using thematic analysis. A five-point Likert scale with answers from 'always' to 'never' was used to ask about current experiences of dream, anxiety, sleep problems, fears, irritability and/or mood swings. Scoring ranged from 6 to 30 with a midpoint value of 18 indicating a threshold value for diagnosis of PTSD. A p-value of <0.05 was considered significant for all analyses.

Results: Forty-one patients (40%) consented to take part in the follow-up interview out of 103 potential participants; 18 patients (44%) had been delirious and 23 patients (56%) non-delirious during the ICU admission. The non-participants (n=62) formed a control group to ensure a representative sample; 83% (n=34) reported factual memories either with or without recall of dreaming. Factual memories were significantly less common (66% c.f. 96%) in delirious patients (OR 0.09, 95%CI 0.01-0.85, p=0.035). Five topics emerged from the thematic analysis: 'procedures', 'staff', 'comfort', 'visitors', and 'events'. On current experiences five patients (12%) (four non-delirious and one delirious) scored  $\geq 18$  indicative of symptoms of PTSD. This did not reach a statistically significant difference. Memory of transfer out of ICU was less frequent amongst delirious patients, 56% (n=10) than non-delirious 87% (n=20) (p=0.036)

Conclusion: Most patients have factual memories of their ICU stay. However, delirious patients had significantly less factual recall than non-delirious. Adverse psychological sequelae expressed as PTSD was uncommon in our study. Every attempt must be made to ensure the ICU environment is as hospitable as possible to decrease the stress of critical illness. Post-ICU follow-up should include filling in the 'missing gaps' particularly for delirious patients. Ongoing explanations and a caring environment may assist the patient in making a complete recovery both physically and mentally.

**Keywords:** Facts; memories; ICU; delirium screening; delirium incidence, nursing

## **Introduction**

Patients who require Intensive Care Unit (ICU) treatment may encounter untoward experiences lasting well beyond the physical recovery of their illness. These incidents may include factual and/or delusional memories of ICU such as dreams and hallucinations. People, including staff and visitors (Russell, 1999), the environment, such as level of noise and lighting (Ampelas et al., 2002) and procedures for example extubation and endo-tracheal suctioning (Todres et al., 2000) are frequently cited factual memories encountered in ICU and often perceived as stressors to the patients. The presence of several such stressors may lead to the development of reduced health related quality of life or post-traumatic-stress-syndrome (PTSD) (Eddleston et al., 2000; Scragg et al., 2001). Yet, the memories may be altered and dampened by the illness itself, by ICU treatment such as sedation (Ghoneim, 2004); and by delirium (Jones et al., 2001).

### *Factual memories*

Over a third of patients have some degree of factual memory regarding their admission to ICU. These recalls are particularly related to artificial ventilation, such as suctioning and removal of the endotracheal tube (ETT). Factual memories appeared to occur more frequently in patients admitted following elective surgery and observed to be related to a shorter length of ICU stay in some studies (Capuzzo et al., 2004; Kvale et al., 2003; Rotondi et al., 2002). Rundshagen et al. (2002) interviewed 289 patients within three days of ICU discharge and after examining the responses from the 17% (n=49) who described factual memories of ICU, questioned if recall has an impact on psychological outcome. They proposed further studies to evaluate the impact of using sedation scoring to guide therapeutic intervention. Green (1996) concluded following 26 patient interviews, that most patients had vivid recollection of fear and worry about their transfer out of ICU. On the other hand the patients did remember the explanations, which were given to them by nursing staff, in detail, but also felt they would benefit from follow-up visits to discuss and clarify issues arising from the ICU stay. Russell (1999), further identified poor communication, lack of privacy and noise as the most disturbing memories. Poor communication caused anxiety not only during the ICU stay but was an impediment to optimal recovery after discharge. On the other hand, when Adamson et al.

(2004) interviewed six patients at six months after ICU discharge they noted that the patients did not have specific positive or negative memories of ICU. However, integration of ICU services with the remainder of the health care services could target physical and psychological problems through the implementation of specific outpatient clinics and/or the use of patient diaries.

Memories of ICU may not all be negative and stressful. Rattray et al. (2004) interviewed 109 patients with 80% of patients rating their care as good, over half the patients reporting that they felt safe and 40% never felt scared whilst in ICU. In a study by Granberg et al. (1998), the presence of a caring relationship either with family or carers had a positive impact on the patient and contributed to a decreased level of fear. Jones et al. (2001) stated that factual recall, however traumatic (e.g.ETT, suctioning) during the ICU stay may, in fact, protect against anxiety and panic attacks post ICU discharge.

#### Post-Traumatic-Stress-Disorder

A significant number of ICU patients develop severe psychological sequelae to their hospital stay such as Post-Traumatic-Stress-Disorder (PTSD), sub-syndromal PTSD and clinically relevant symptoms of anxiety and depression (Cuthbertson et al., 2004; Schnyder et al., 2001). The ICD-10 Classification of Mental and Behavioural Disorders describes PTSD as a 'delayed and/or protracted response to a stressful event or situation (either short- or long-lasting) of an exceptionally threatening or catastrophic nature, which is likely to cause pervasive distress in almost anyone.' (World Health Organization, European Edition, Geneva, 1992.PAGE) Patients who suffer PTSD often relive the experience through nightmares and flashback, have difficulties sleeping and feel detached or estranged (US Department of Veterans Affairs, 1989). Griffiths & Jones (2001) cite in an editorial that patients remembering delusions from their ICU stay are more likely to show symptoms of PTSD and quote depression rates of 20-30% amongst these patients two months after ICU discharge.

Schelling et al. (1998; 2003) described in two studies the development of PTSD in two different patient groups, Acute Respiratory Distress Syndrome (ARDS) patients and those following cardiac surgery and they related PTSD to the ICU admission. Kapfhammer et al. (2004) conducted a follow-up study in the above patient population and concluded that long-

term survivors of ARDS seem to face a major risk of PTSD and impairments in health-related quality of life. Stoll et al. (1999) propose that critical illness necessitating ICU admission was the single major stressor that resulted in the development of PTSD.

### *Factual memories and the presence of delirium*

It is well documented in the literature that admission to ICU often leads to the development of delirium (Ely et al. 2004; Marshall and Soucy, 2003; Roberts, 2004). Likewise, Ely et al. (2001), Jones et al. (2003) and McCusker et al. (2002) have researched the incidence and outcome of delirium and Capuzzo et al. (2004), Jackson et al. (2003) and Kvale et al. (2003) have studied the psychological sequelae following ICU admission examining quality of life and cognitive function. Rotondi et al. (2002) described some associations between factual memory (the endo-tracheal tube) and recollection of spells of terror and panic without having evaluated the patients for delirium during their ICU admission. Nevertheless, to our knowledge only one other study has linked the two phenomena of observed behaviour during ICU admission and subsequent report of factual memories post discharge (Jackson et al., 2003). They subsequently recommend from their six-month neurophysiological outcome study that such a link should be further explored to ascertain the real impact of delirium on long-term prognosis.

This present study describes the relationship between patients' observed behaviour using a validated screening tool during the ICU admission, recall of factual memories from this stay and subsequent patient outcomes.

## **Method**

### **Design**

Prospective cohort study

### **Setting**

Three Australian ICUs, two tertiary referral centres (Level 3) facilities (Sir Charles Gairdner Hospital, Western Australia; Royal Prince Alfred Hospital, New South Wales) and one provider of high standard ICU care (Level 2) (Latrobe Regional Hospital).

## **Sample**

The patient cohort for this study was assembled from 152 patients from three of six Australian and New Zealand ICUs who participated in a previously conducted multi-centre observational study to determine the incidence of ICU delirium. The inclusion criteria for that study were: informed consent, admitted to ICU for longer than 36 hours, had been in hospital no longer than 96 hours prior to ICU admission and not suffered any cerebral insult, or any past medical history of dementia or delirium. In total 185 patients were screened in the six ICUs across Australia and New Zealand for delirium in the second half of 2002, using the 'Intensive Care Delirium Screening Checklist' (Bergeron et al. 2001) for the duration of their ICU admission. Some 84 patients (45%) developed delirium, which was associated with higher admission APACHE II (severity of illness score) (Knaus et al. 1985) and sequential SOFA (organ dysfunction score) (Vincent et al. 1996) scores, increased ICU length of stay, and the use of psychoactive drugs. (Roberts et al, 2005)

Review of hospital databases identified that 103 of the 152 patients in the three centres participating in the current study were alive and potentially contactable 18 to 24 months after ICU discharge, and these people were invited via mail to participate.

## **Ethics and consent**

The study received approval from the local Human Research Ethics Committee at each site. An information sheet outlining the study including its objectives, a consent form, a decline to participate form and a self-addressed stamped envelope were mailed to each potential participant. The information sheet asked permission to contact the participant by telephone to collect follow-up information and stated that participant's comments and answers during the interview would be recorded. If neither consent nor decline to participate form was received, a once off telephone contact was made to ascertain whether the mail-out had been received.

The data for the 'Reference Group' were obtained from participants in the previous conducted and ethically approved study as described above (Roberts et al., 2005).

## **Study Processes**

Upon the investigator's receipt of a signed consent form, patients were contacted by telephone to arrange a suitable time to undertake a telephone interview. The same

researcher at each site undertook the interviews, after joint training and discussion to standardise technique. The interviewer at each site accessed demographic information about the cohort prior to the interview but was blinded to patients' observed behaviour (delirious/non-delirious) whilst in ICU.

Interviews took approximately 30 minutes and involved a mixture of closed-ended and open-ended questions (Figure 1). The closed-ended questions were adapted from Jones et al. 2001 and Stoll et al. 1999 and concentrated on the present period using a 5-point Likert scale with answers from 'always' to 'never'. The interviewer took notes during the interview and these notes were read back to the participants for verification. A copy of the completed questionnaire was subsequently mailed to the participants for any further comments or changes.

### Data analysis

#### *Qualitative Data*

Qualitative responses regarding factual memories were analysed using thematic analysis as per Colaizzi's method (Colaizzi, 1978). That is, similar statements were grouped together into categories and the categories given a label. Categories were examined for similarities and differences. Significant statements were extracted and meanings were formulated into themes and fundamental statements were developed. This was a two-stage approach: Firstly, each investigator reviewed the data from their respective site separately. Secondly, the investigators jointly reviewed the data and finalised the categories, statements and themes.

#### *Quantitative Data*

Quantitative analysis was undertaken using SPSS software (version 11.0, SPSS Inc., Chicago, IL). Categorical data was compared using chi-square with Fisher's exact test, and non-parametric data was assessed for normality of distribution then compared using Mann-Whitney U-Test.

A five-point Likert scale with answers from 'always' to 'never' was used to ask six questions of current experiences of stressors that would indicate the presence of PTSD related symptoms. The questions were related to themes of dream/nightmares, panic/anxiety, sleep problems,

fears, irritability and/or mood swings. An answer of 'always' scored 5, 'regularly' scored 4, 'sometimes' scored 3, 'rarely' scored 2 to 'never' scoring 1 gave a range of scores from 30 to 6. Extrapolated from Stoll et al. (1999) a score of more than 18 (midpoint) would indicate a threshold value for diagnosis of PTSD (Fig. 1).

## **Definitions**

Delirium: A score of 4 or greater at any stage of the ICU admission on the Intensive Care Delirium Screening Checklist (ICDSC) (Bergeron et al., 2001). ICU nurses calculated these scores twice daily.

Memories: Recollections of factual events happening during the ICU admission as recalled by patients 18-24 months post-discharge.

## **Results**

### Sample

Forty-one patients (40%) consented to take part in the follow-up interview out of 103 potential participants; 18 patients (44%) had scored positive for delirium on the ICDCS and 23 patients (56%) had been non-delirious according to the ICDCS. The non-participants (n=62) formed a reference group to ensure our sample was representative. Only previously published information was used for non-participants (Roberts B et al., 2005).

### Factual memories and delirium

83% (n=34) of the 41 patients reported factual memories either with or without recall of dreaming. Factual memories alone were remembered by 49% (n=20) and 34% (n=14) remembered a combination of dreaming and factual events. Factual memories were significantly less common (67% cf 96%) in patients who had been delirious in ICU (OR 0.09, 95%CI 0.01-0.85, p=0.035) (Table 1).

### Thematic analysis

Five topics emerged from the thematic analysis. These included predominantly 'procedures' such as having X-rays taken, changing of dressings and dialysis as well as 'staff' in particular

nursing and medical staff caring for the patients. Another common theme related to areas of 'comfort' including thirst and feeling secure. 'Visitors', in particular family and spouse, and 'events' such as returning to operating theatre and waking up were less frequently reported (Fig. 2).

#### *Factual memories, delirium and effect on present time-period*

In response to whether the patients currently suffered from dream/nightmares, panic/anxiety, sleep problems, fears, irritability and/or mood swings five patients scored  $\geq 18$  indicative of symptoms of PTSD. The majority of these (n=4) had scored  $\leq 4$  on the ICDSC indicating non-delirium, and one patient who was delirious (ICDSC score  $> 4$ ) had a PTSD score  $\geq 18$ . All five patients had factual memories of the ICU. Three including the one delirious patient recalled dreams during their ICU stay. Even though the data suggest that PTSD scores were higher for the non-delirious patients, this did not reach a statistically significant difference.

Most non-delirious patients remembered being transferred out of ICU (n=20, 87%), whereas only a little over half the delirious patients remember this move (n=10, 56%). This attained a statistically significant association between being delirious and being unable to remember being transferred out of ICU (p=0.036).

#### **Discussion**

Despite mostly anecdotal accounts that only few ICU patients do remember their stay, we found a large proportion of ICU patients actually had clear factual recall with or without dreaming recall from their ICU admission (83%). These are similar figures to studies by Jones et al. (2001) and Rotondi et al. 2002 who found 73% (n=33) and 67% (n=100) respectively of patients had either factual memories or a combination of factual memories and dreaming. The patient cohort in all three studies were largely identical. Therefore, when Kvale et al. (2003) reported 57% (n=36), Capuzzo et al. (2004) quoted 29% (n=25) and Rundshagen et al. (2002) stated that only 17% (n=49) of patients had clear memories of factual experiences from their ICU stay the question begs to be asked as to why the inconsistent findings. One hypothesis may be differences in sedative medication. In the present study the use of morphine, midazolam and propofol were prevalent in the participating ICUs, whereas the

other studies reported additional use of diazepam, sufentanil and clonidine. Another theory may include the relationship with mechanical ventilation as Kvale et al. (2003) reported that only 34% of patients with memories of ICU were ventilated versus 73% in the present study. The types of admission may play a role such as the study by Capuzzo et al. (2004) where only 40% of patients with factual memories accounted for acute admissions versus 78% in the present study. Yet another contributing factor may be the length of stay with the patients in the study by Rundshagen et al. (2002) only being admitted for a median time of one day and largely represented elective admission, hence the memories may be impeded by general anaesthesia. Additionally, the time between waking from sedation and discharge from the ICU with the introduction of 'step-down-units' becoming more widespread may also influence the memories of factual events from the ICU. This has not been recorded in any of the studies so therefore remains unknown. It is clear though, that further and more standardised studies are needed to answer some of these crucial questions.

It is not surprising that non-delirious patients have significantly clearer recall of factual events, and indeed the presence of delirium significantly diminished the incidence with 6 patients out of 18 delirious patients being devoid of factual memories. Since we have only been able to cite one other research study on an ICU patient population, who has been assessed for delirium and then subsequently been interviewed it is difficult to set a benchmark. Jackson et al. (2003) conclude by advocating delirium screening to take place in future cohort studies. Katz et al. (2001) reported from a study of elderly in-patients in a non-acute setting and nursing home residents who had been assessed for delirium, that there was no significant difference in physical functioning between delirious and non-delirious participants. However, it may not be possible to extrapolate these results to our findings since the study population exhibited great differences.

The three main themes for factual events were procedures, staff and comfort related issues. Daffurn et al. (1994) described similar factual memories in a comparable group of 54 patients and likewise the recurrent themes of factual memories were related to ETT, catheters, physiotherapy, pain and thirst. Rotondi et al. (2002) reported that 67% of their study

population (n=100) remembered the ICU admission and/or the ETT and the majority reported moderate to severe discomfort from or associated with the ETT, such as pain and inability to speak. There is significant variation in length of time between ICU admission and interview with Rotondi et al. (2002) interviewing their cohort prior to hospital discharge, Daffurn et al. (1994) after three months and in the present study up to two years had lapsed since ICU admission. Despite this discrepancy the memory of the ETT seems overwhelmingly the most important factor. Although there is very little that can be done, one option would be to perform early tracheostomy. Whilst tracheostomised patients would still require suctioning and physiotherapy these therapies are considered to be less distressing than when performed via an ETT and the tracheostomy tube is generally better tolerated by the patients. Therefore the health carers must be made aware of the discomfort that patients feel from the ETT and ensure optimal information and reassurance are given to the patient as well as pain relief and/or sedation as appropriate especially prior to physiotherapy treatment and ETT suctioning.

Many studies focus on negative memories using leading questions such as 'being uncomfortable' and 'feeling anxious' (Capuzzo et al., 2004); 'remember feeling something bad will happen' (Rotondi et al., 2002); and 'report the number of pre-defined adverse events' (Schelling et al. 1998.) These observations were also echoed in the present study, from a CPAP (continuous positive airway pressure) mask fitting tightly over the face, to 'snap answers from the doctor', 'being in pain' and having the hands tied. However, not all recalled experiences are bad and we must also keep that aspect of factual memories in mind when discussing ICU sequelae. Granja et al. 2004 reported recall of the ICU environment as friendly and calm with sufficient sleep. Russell (1999) transcribed terminology such as feeling comforted and safe, with similar expressions also used in the present study, where many patients praised their carers. Even though in all three studies these expressions were a minority it remains important to emphasise the benefit of reassurance and empathetic care by a simple but genuine gesture of holding the patient's hand and using thoughtful words. This idea was echoed in Todres et al. 2000 study, where the use of therapeutic touch was reported

to assist in humanising the ICU environment. Similarly, the patients in this study reported comfort from nursing staff, family visiting and feeling really peaceful.

Only five patients (12%) suffered sufficiently severe ongoing sequelae of their ICU experience in the present study to reach the intensity of PTSD. Four of these patients had not suffered from delirium but all five had factual memories of their ICU stay with three of the five patients having combined dreaming and factual memories. This incidence is reflected in Cuthbertson et al. (2004), who found 14% (n=11) of a similar patient cohort interviewed three months after ICU discharge were suffering from PTSD. Daffurn et al. (1994) reported that almost half the patients interviewed at three months following ICU discharge had varying symptoms of severe stress but only one patient meeting the criteria for PTSD. Likewise, in a one-year follow-up study of 106 trauma victims Schnyder et al. (2001) found 25% of patients (n=27) suffered clinically relevant psychopathological symptoms but only two patients (1.9%) qualified as PTSD and 12% suffered sub-syndromal PTSD.

This is in contrast to other studies, namely Stoll et al. (1999), who reported the incidence of PTSD to be 25% amongst 52 long-term survivors of acute respiratory distress (ARDS). Similarly, Hopkins et al. (2005) reported the incidence of neurocognitive sequelae to be just under 50% amongst another group of ARDS survivors and about a quarter of the patients described severe depression and anxiety two years after ICU discharge. These higher incidences may reflect the select patient population (ARDS), which include sicker patients with longer ICU stay and the need for protracted mechanical ventilation and may not be reflected in the general ICU population such as in the present study. Additionally, there appears to be a lack of homogeneity with regard to follow-up times, the questionnaire used and the use of assessments such as subjective evaluation versus psychiatric evaluation.

Jones et al. (2001) found that factual memories no matter how unpleasant they are appear to protect against the development of PTSD. Since the occurrence of PTSD related symptoms in the present study is so low, and with a lack of uniform methods to assess PTSD it is impossible to draw any conclusions, but we note that our non-delirious patients seemed more prone to developing negative psychological sequelae.

Memories of ICU transfer may be related to the overall recall of factual events. Maybe not surprisingly, most non-delirious patients remembered their transfer out of ICU although in total 76% of patients did remember leaving the unit. Interestingly, three of the nine delirious patients who remembered being transferred had no factual memories of the actual stay. To our knowledge, no study comments on this particular point of patient recollection despite asking the question in the interview.

### **Implication for Future Practice:**

This study highlights the ever-present need for continued patient information, re-assurance and optimised comfort. Whilst we as health care professionals can not remove the stressors of the ETT, the need for dressing changes, the life-saving indwelling catheters and tubes, we can and must minimise the impact of these devices. First of all we must inform the patients of what we are about to do, provide adequate pain relief and respect the patients' feelings. It is encouraging to hear the comments from the patients of empathetic health care staff and the patients' experiences of peace and security, but there is no excuse for curt answers from any staff member or pain experiences. Above all it must be remembered that most patients are aware of their surroundings whilst in ICU. It should therefore be part of ICU education to include issues regarding all aspects of patient care in this particularly vulnerable sub-set of patients to optimise their feeling of security, comfort and self-respect.

### **Limitations:**

The small sample size and the use of a questionnaire rather than direct patient contact may prove a shortcoming in the present study and did contribute to the reduced number of neuropsychological investigations. Besides, whilst the interviewers were all experienced ICU nurses, none possessed formal psychological training. The multiple sites may provide a cross-section of patient population making the present study more generalised however, despite the best attempt at uniform interview technique, different interviewers may have used slightly different approaches and interpretations of patient responses.

### **Conclusion**

The burgeoning debate in the literature regarding long-term neuropsychological and neurocognitive sequelae to the ICU stay remains plagued by the lack of uniform methods and techniques. This includes delirium screening tools, questionnaires, and tests performed, as well as the time span from ICU discharge to follow-up. Nevertheless, the psychological recovery of the ICU patient is probably just as important as the physical recovery if not more important to the patient him/her self and the family. It is possible to live and adapt to some form of physical disability if only in a sound mind or at least at the pre-morbid level of mental functioning. Every effort must be made to help the patient and family to overcome the negative psychological effects of ICU particularly in the three main domains of patients' memories: procedures, comfort and staff. The nursing staff are at first hand to provide this support whilst the patient is still in the ICU by providing ongoing explanations of procedures performed and ensuring appropriate pain relief without over-sedation. It is imperative to keep in mind that most patients have significant recall of their stay in ICU, and at the same time most patients have fond memories of caring and nurturing staff, in particular the nursing staff. However, ongoing care and support are needed to provide long-term rehabilitation. Increasing evidence suggests follow-up clinics or visits by experienced senior ICU nursing staff may help in addressing this issue. These clinics however few and far between are still in their infancy, but may prove a valuable beginning. Improved staff awareness, patient/relative teaching and information strategies either by direct contact/information or the use of booklets may be another way of making improvements. Of concern, are the patients who have no factual recall from ICU admission, and may desire de-briefing after the event by staff who were present during the admission. Since delirium was observed to significantly predict reduced factual memories, this may therefore be the primary group to target for follow-up care.

Though PTSD is a significant and debilitating phenomenon, which cannot be disparaged, it is important to focus on the fact that patients do have positive memories as well and these memories may well provide a barrier against PTSD and long-term adverse psychological sequelae.

## **Contributions**

Study design:

Data collection and analysis:

Manuscript preparation:

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**FIGURE 1**

**Questions posed to the patients relating to current experiences indicating the level of ongoing stress the patient may suffer**

<b><i>Do you remember the time in hospital before coming to intensive care</i></b>					
Y / N / Unsure					
<b><i>Do you remember being in intensive care?</i></b>			Y / N / Unsure		
<b><i>Can you describe what you do remember about your time in ICU?</i></b>					
<b><i>Anything that made it good / bad?</i></b>					
<b><i>Do you remember being transferred from intensive care to the general ward?</i></b>					
Y / N / Unsure					
<b><i>Do you still experience any dreams or nightmares?</i></b>					
Always	Regularly	Sometimes	Rarely	Never	
<b><i>Have you had any unexplained feelings of panic or anxiety</i></b>					
Always	Regularly	Sometimes	Rarely	Never	
<b><i>Do you suffer any sleep problems/disturbances?</i></b>					
Always	Regularly	Sometimes	Rarely	Never	
<b><i>Do you suffer any fears</i></b>					
Always	Regularly	Sometimes	Rarely	Never	
<b><i>Do you suffer any irritability</i></b>					
Always	Regularly	Sometimes	Rarely	Never	
<b><i>Do you suffer any mood swings</i></b>					
Always	Regularly	Sometimes	Rarely	Never	

**TABLE 1.**

**Delirium status in the ICU and recalled factual memories 18-24 months post-discharge**

		<b>Delirium (n=18)</b>	<b>Non-Delirium (n=23)</b>
<b>*Factual memories, n, (%)</b>	Yes	12 (67%)	22 (96%)
	No	6 (33%)	1 (4%)

\* Difference between Delirium and Non-Delirium groups, OR 0.09 95% CI 0.01-0.85, p=0.35)

## FIGURE 2

### Thematic analysis with examples of factual memories experienced during the ICU admission

1. PROCEDURES
<ul style="list-style-type: none"><li>• Taking x-rays at the bedside</li><li>• Having an indwelling urinary catheter in</li><li>• The pipe to help you breathe/tape on face</li><li>• CPAP mask awful</li><li>• Chest puncture</li></ul>
2. STAFF
<ul style="list-style-type: none"><li>• I had a nurse beside me for 24 hours</li><li>• A lovely doctor</li><li>• Snap answers from doctor</li><li>• Holding the nurse' hand</li><li>• Physiotherapists</li></ul>
3. VISITORS
<ul style="list-style-type: none"><li>• Friend</li><li>• Family speaking to me</li></ul>
4. COMFORT
<ul style="list-style-type: none"><li>• Feeling secure/frightened</li><li>• Really peaceful</li><li>• Being thirsty</li><li>• Being in pain</li></ul>
5. EVENTS
<ul style="list-style-type: none"><li>• Return to OT</li><li>• Change of dressing</li><li>• Hands tied</li><li>• DC shock</li></ul>

**TABLE 2****Remember being transferred out of ICU**

		Delirious		Total
		Yes	No	
Remember transfer out of ICU	YES	10	20	30
Remember transfer out of ICU	NO	8	3	11
Total		18	23	41

Fisher's Exact Chi-Square Test: p-value (2 sided) = 0.036