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# CONSCIOUS SURGERY: INFLUENCE OF THE ENVIRONMENT ON PATIENT ANXIETY

## Abstract

**Aims:** i) To investigate anxiety arising from the experience of the clinical environment during surgery under local/ regional anaesthesia and, ii) to uncover the specific aspects patients find anxiety provoking and possibly dissuade them from opting for such anaesthesia.

**Background:** Operating theatres have historically been designed for safe, efficient surgery on the unconscious patient and not primarily designed for the care of the 'awake' patient. However, with the rise in day surgery, the quantity of surgery performed under local/ regional anaesthesia is increasing.

**Method:** As part of a larger study investigating anxiety within modern elective day surgery, adult patients undergoing surgery and local/ regional anaesthesia (n=214) were provided with a questionnaire on the day of surgery for return by mail 24 - 48 hours following surgery.

**Findings:** The experience of being awake, possibly feeling surgeon, seeing body cut open or surgery being more painful were anxiety provoking aspects. Utilising factor analysis 'intra-operative apprehension', 'anaesthetic information provision' and 'health control' were identified as central features. Moreover, when employing multiple regression, apprehension associated with the intra-operative experience and anaesthetic information provision were significantly associated with an increase in the overall level of anxiety.

**Conclusions:** Although the surrounding clinical environment has previously been a cause of apprehension, the sensations associated with the physical act of surgery on the conscious self appear also to have a considerable influence. Focusing care upon managing patient intra-operative experience and providing anaesthetic information in advance may help limit anxiety and expel the apparent misapprehensions associated with conscious surgery.

## **K e y w o r d s**

Day/ ambulatory surgery, surgery, conscious, awake, local and regional anaesthesia.

## **W h a t i s a l r e a d y k n o w n a b o u t t h i s t o p i c**

- The number of surgical procedures performed under local and regional anaesthesia in day surgery is growing.
- Historically, the focus of operating theatre design has primarily been concerned with the care of the unconscious patient.
- Studies have recommended improving the environment, that is, operating theatre atmosphere, providing regular patient updates/ intra-operative explanations and improving anxiety management, to encourage more patients to opt for local or regional anaesthesia.

## **W h a t t h i s p a p e r a d d s**

- Contemplating potentially adverse intra-operative experiences directly associated with conscious surgery gave rise to considerable anxiety.
- The provision of information regarding intra-operative experiences would help to reduce anxiety for the majority of patients.
- Contemplating potentially adverse intra-operative experiences and desiring distinct anaesthetic information were accurate predictors of an overall higher level of anxiety on the day of surgery.

## **I n t r o d u c t i o n**

The purpose the study was to investigate the psychological impact of the surgical environment on the conscious adult patient undergoing elective, day surgery. This was deemed necessary as the number of surgical procedures feasible within modern day surgery is increasing both nationally and internationally (Howat et al. 2006, Jacquet et al. 2006). Correspondingly, the number of surgical procedures now possible employing local or regional anaesthesia is also increasing (Zanchetta and Bernstein 2004, Ternisien et al. 2006). Advances in anaesthesia will progressively enable a greater proportion of local and regional anaesthesia to be undertaken on a day surgery basis (Raeder 2006). However, operating theatre design and function has traditionally been associated with the care of the unconscious patient (Essex-Lopresti 1999). With the predicted decline in the number of patients experiencing general anaesthesia, care of the 'awake' patient in theatre will, by necessity, become a more prominent feature of surgical nursing intervention. As highlighted by Chit Ying et al (2001), the anaesthetist once took full responsibility for the patient during anaesthesia although with the stated increase in local and regional anaesthesia, support for the conscious patient will progressively become a major responsibility for the nurse.

## **B a c k g r o u n d**

A number of studies have examined interventions appropriate for the 'awake' patient within the operating theatre environment. In an early study by Kennedy et al (1992), 115 participants were surveyed following caesarean section under regional anaesthesia to assess the impact of the theatre environment. Arriving at the theatre was the most stressful element although this was associated with the imminence of the surgical procedure and not the environment per se. Chit Ying et al (2001) also studied patients undergoing elective, caesarean section highlighting that many experienced anxiety during part of the procedure. The sounds of the operating room, narrowness of the table and low environmental temperature were all perturbing issues. Hankela and Kiikkala (1996) further uncovered the negative impact of the environment when interviewing patients following regional anaesthesia for hip replacement. Many participants felt anxious regarding the theatre environment. For example, the narrow table, dark room, noise of drilling, sawing and cutting were all disturbing features. However, the nurse being close and utilising touch/ comforting words provided some positive distraction. The issue of noise in the form of monitor alarms and surgical instruments being unpacked was also raised by Jakobsen and Fagermoen (2005) following a survey of 68 patients scheduled for elective surgery under general anaesthesia. In studies by Liu and Tan (2000) and (Mauleon et al. 2007) it was concluded that noise prevention within the operating theatre/ recovery room required greater attention or should be a routine part of patient care.

Several studies have highlighted further negative aspects of local and regional anaesthesia. Birch et al (1993) surveyed 124 day surgery patients experiencing cystoscopy under local anaesthesia and determined many patients to be highly anxious on the day of surgery. Most anxious were those undergoing the procedure for the first time, younger patients and female patients. In a survey by De Andres et al (1995) of patients experiencing regional anaesthesia for orthopaedic surgery, early family contact, staying awake and the early intake of food were all stated as positive aspects. However, intra-operative anxieties arising from the perception of the surgeon's touch or the pain from needle puncture were negative aspects. The negative impact of needle puncture was also expressed by Koscielniak-Nielsen et al (2002). This study was undertaken to determine which aspect of an axillary block (regional anaesthesia) was the most painful, that is, the intra-venous line insertion, repeated needle passes, local anaesthetic injection or electrical stimulation. Fifty-three percent of patients perceived electrical stimuli as the most painful although "We found in this study that patients' anxiety for multiple injection axillary block is reduced after step-by-step explanation and own experience of the blocking procedure." (p. 791). In a brief reporting by Gajraj and Sidawi (1993), 40 patients undergoing tubal ligation with spinal anaesthesia were questioned concerning the pain of the needle puncture (hand and spine). Although the pain from both insertions was reported as relatively low, spinal needle insertion was deemed significantly more painful. In a large survey of patients undergoing hernia repair under local anaesthesia by Callesan et al (2001), 80% stated they would undergo the same type of surgery and anaesthesia again. However, insufficient use of local anaesthesia was the main cause of patient dissatisfaction. In a large Local Government survey of 1,216 people in Canada Matthey et al. (2004) concluded that 27% of people were concerned with the possible pain or permanent paralysis associated with regional anaesthesia. Additionally, 26% were fearful of seeing the surgery or having a needle put into their back.

Numerous studies have recommended supportive intra-operative measures such as communication and touch. Thorpe et al (1993) surveyed 115 patients experiencing caesarean section under regional anaesthesia and recommended i) procedural formation provision (sequential order of events), ii) behavioural preparation (communicating the patient's role during procedure) and, iii) cognitive coping strategies (you will be safe because ...) to aid anxiety management. In a survey by Kennedy et al (1992) of patients also undergoing elective caesarean section, feelings of helplessness were strong with the most effective support talking to a relative or a midwife. In a study again concerning patient's experience of regional anaesthesia, Hankela and Kiikkala (1996) reported that, at times, staff forget about the patient during the surgery. Nurses frequently communicated with other staff members without considering the patient. Moreover, when decisions were being made regarding their care, patients were frequently excluded and therefore felt like 'outsiders'.

Ophthalmic studies have reiterated the need for such supportive elements. Following a study by Nijkamp et al (2002) it was stated that "Patients reported a feeling of helplessness and oppression while lying underneath a cloth during surgery or shivering with cold in the operating theatre." (Nijkamp et al. 2002 p.269). However, patients stated that the ophthalmologist talking to them during the procedure helped to ease their anxiety. In an experimental study by Moon and Cho (2001) concerning intra-operative communication, 62 patients experiencing cataract surgery under local anaesthesia were divided into two groups. The experimental group experienced handholding during the surgical procedure while the control group received no intervention. Utilising emotional and physiological measures, the experimental group were significantly less anxious intra-operatively than the control group. However, this was not the case in a more recent study. The need to lie still, not to move one's head but continue to communicate effectively during ophthalmic surgery was the focus of a study by Mokashi et al (2004). Having a hand held buzzer by which the patient could communicate intra-operatively was deemed just as effect as holding the hand of a nurse.

Further aspects of touch and distraction have also gained positive results. In an experimental study by Kim et al (2001), 59 patients undergoing cataract surgery were randomly divided into two groups. The experimental group received 5 minutes, 2 minutes and 30 seconds of hand massage immediately prior to surgery then again for 5 minutes before the end of surgery. The control group received no hand massage. The experimental group rated themselves as significantly less anxious intra-operatively than the control group. Faymonville et al (1997) conducted an experimental study utilising 60 day surgery patients undergoing local anaesthesia for reconstructive surgery. The experimental group received instructions on how to breathe deeply and relax intra-operatively in order to help buffer the pain and stress of surgery. This technique significantly reduced intra-operative anxiety but only in comparison to the experimental group's pre-operative levels (not between groups). Both Koch et al (1998) and Lepage et al (2001) recommend the use of intra-operative music as this had the ability (when patients were provided with a choice of music) to decrease the sedation requirements of the awake patient while undergoing surgery and spinal anaesthesia. Man et al (2003) conducted a randomised controlled study to evaluate if viewing a video compact disc (CD) programme intra-operatively decreased anxiety. Utilising emotional measures of anxiety during the post-operative period, the experimental group did indeed experience significantly less intra-operative anxiety.

Crucially, several studies have suggested the majority of surgical patients prefer general anaesthesia to local anaesthesia (Shevde and Panagopoulos 1991, Papanikolaou et al. 1994). Rees and Tagoe (2002) surveyed 270 adult patients scheduled for foot surgery under local anaesthesia. However, on the day of surgery, 23% (n=71) expressed a preference to change their choice of local anaesthesia to general anaesthesia. Common reasons for not wanting local

anaesthesia were the possibility of experiencing injection pain, dislike of being awake in the operating room and the unpleasant wait between anaesthesia administration and surgery. Moreover, desiring general anaesthesia and subsequently having local anaesthesia was associated with decreased satisfaction. Gajraj et al (1995) interviewed 100 patients prior to general anaesthesia for elective caesarean section. When discussing their anaesthetic with the anaesthetist the evening before surgery, all participants had refused regional anaesthesia. Common reasons for refusal were fear of backache (33%), fear of needle placement being painful (28%) and fear of seeing or hearing aspects of the surgery (10%).

Brown (1990) suggested patients can be very anxious and unsure when encountering surgical treatments perceived as 'new'. Adequate information provision, good preparation and assurances of safety were therefore highly recommended. Both Gnanalingham and Budhoo (1998) and Jakobsen and Fagermoen (2005) suggested that improving the operating room atmosphere, providing regular updates/ explanations to patients and improving anxiety management would make good economic sense in encouraging more patients to opt for local anaesthesia. Likewise, in a study of 15 patients undergoing brain tumour removal under local anaesthesia by Whittle et al (2005), it was concluded that increasing comfort enhanced satisfaction and aided anxiety management. For example, a comfortable operating table, keeping the patient warm, a dedicated person for patient communication and minimising pain and discomfort. In a survey concerning peri-operative care by Leinonen et al (1996), the majority of patients interviewed were awake in the operating theatre (spinal block or L.A.). "In their open-ended responses, the patients said the best thing about their care had been the personnel (and particularly their professional competence, friendliness and sense of humour)." (p. 848).

The possible pain associated with the local anaesthetic injection, limited communication and the immediate physical theatre environment (temperature, darkness, and comfort) appear the main impediments for patients in opting for local or regional anaesthesia. However, during such surgery, patients clearly deem close intra-operative contact and communication with theatre personnel as very important. As the theatre environment has historically been associated with the care of the unconscious patient, peri-operative practices may now require greater scrutiny. A study examining the wider issues of the modern theatre environment and the 'awake' patient was therefore deemed necessary to help augment surgical nursing knowledge. For patients undergoing local or regional anaesthesia the precise origin of intra-operative anxiety associated with the environment required further examination - especially regarding modern day surgery. The research question was therefore - What environmental factors influence anxiety for the 'awake' adult patient undergoing, elective day surgery.

## **T h e S t u d y**

### *Aims of the study*

1) To investigate patient anxiety arising from the experience of the clinical environment during surgery under local/ regional anaesthesia and, 2) to uncover the specific aspects patients find anxiety provoking and possibly dissuade them from opting for local/ regional anaesthesia.

### *Design*

The clinical staff within each DSU distributed the questionnaires to the patients on the day of their surgery. The Principle Investigator (MJM) regularly contacted each DSU to replenish the supply of questionnaires. Potential participants were invited to enter the survey and an information leaflet concerning the survey was provided prior to their final decision to take part. Questionnaires were to be completed at home 24 - 48 hours after surgery and return by mail in the 'freepost' self-addressed envelope provided.

### *Participants*

A convenience sample of patients scheduled for elective surgery within four public day surgery units were invited to take part in the study. The inclusion criteria being patients undergoing local or regional anaesthesia, non life-threatening, intermediate day surgery, English speaking and aged from 18 years upwards. The exclusion criteria included patients undergoing ophthalmic and dental surgery as such patients may experience additional anxieties. Also, excluded were patients with any history of chronic physical or mental health problems. However, this issue did not lead to any exclusion as such patients would not normally be considered suitable for elective day surgery (Royal College of Surgeons of England 1992).

### *Data Collection*

Data were collected from four public Day Surgery Units (DSU's) over a two year period (2005 - 2007). All DSU's were situated within and around a large City in the Northwest of England. The survey was part of a larger study encompassing an extensive sample of day surgery patients undergoing local, regional and general anaesthesia for a variety of surgical procedures (n=673). Anxiety associated with the environment, hospital personnel and anaesthesia (local/ regional and general) were the main themes for the larger study. However, this paper will only examine the influence of the environment upon anxiety in patients experiencing local or regional anaesthesia.

The questionnaire employed 61 items with the vast majority of items employing a Likert Scale format inviting participants to tick the appropriate box against the response most accurately describing their interpretation of events. Arrangement of items followed the main themes of the larger study - the environment, hospital personnel and experience of anaesthesia (local/



regional and general). Aspects of the environment explored included social contact, information provision, touch, environment and claustrophobia (Table 1).

### *Validity and Reliability*

The questionnaire was compiled using evidence gained from the literature together with previously undertaken studies within this field (Mitchell 2006, Mitchell 2000, Mitchell 1997). **The questionnaire had clear content validity (items all relate to intra-operative anxiety) (Table 1) and utilised a Likert Scale answer format throughout to provide greater scope for respondents to answer (Field and Hole 2007).** This form of data collection was utilised as patients remain in hospital for a very brief period and recovery time at home prior to a full and active recovery can be as little as 3 - 5 days (Mitchell 2004). Consequently, the time and opportunity for differing forms of data collection is very limited. A pilot study was undertaken for the first 10% of the respondents and resulted in minor amendments to the questionnaires prior to continuation of data collection.

### *Ethical Considerations*

All four public hospitals involved, surgeons, anaesthetists and nursing staff gave their endorsement to the study prior to local Ethics Committee approval. Participants were provided with information concerning the study and it was emphasised that a decision to withdraw at any time, or a decision not to take part, would not affect the standard of care they received.

### *Data Analysis*

To explore the data descriptive statistics, factor analysis and multiple regression were employed. Factor analysis utilised the principal component method of extraction with Varimax rotation and Kaiser normalisation. Furthermore, to ensure the appropriateness of performing factor analysis Bartlett's test of sphericity and measures of sampling adequacy were performed. The values considered adequate to proceed with the factor analysis were the Bartlett's test 0.05 or below and measures of sampling adequacy >0.05. Variables loading on the factors <0.4 were to be rejected, loadings >0.4 weighted according to the importance of their contribution and only factors with an eigenvalue above 1.0 retained (Field 2000). **New factors were to be determined by the high factor loadings on each variable.** Correlations between established factors and overall anxiety levels were undertaken to determine that multiple regression analysis could be performed. Multiple regression helped to a) determine if the dependent variable (overall anxiety level) can be predicted by the new model (predictor variables) and, b) the proportion of the dependent variable explained by the new model (coefficient of determination or  $R^2$ ). Analysis was undertaken utilising Statistical Package for Service Solutions (SPSS) v14.

## Results

A total of 214 patients undergoing local or regional anaesthesia completed the survey. This gave a response rate of 41% of the 523 questionnaires distributed. Participants' ages ranged from 18 years to 75 years with the average age being 53 years (114 females and 98 males). Participants underwent a variety of surgical procedures with General Surgery (hernia repair, cholecystectomy) and Orthopaedic Surgery being the most frequent (Table 2). Twenty-eight patients experienced local anaesthesia for pain management or as part of a medical investigation. All items relating to intra-operative experience were entered into the analysis (Table 1). The number of patients experiencing anxiety on the day of surgery was 161 (77%) although the degree of anxiety varied (Figure 1). Issues concerning the intra-operative experience were a considerable source of anxiety (Table 3). Conversely, the provision of information prior to surgery aided anxiety management (Table 3). Such issues were therefore examined more closely employing exploratory factor analysis.

Factor analysis was undertaken using principal component method with Varimax rotation and Kaiser normalisation. The Bartlett's test was significant ( $p < 0.001$ ) and the measures of sampling adequacy was 0.778, suggesting that it was appropriate to proceed to factor analysis. Three factors had eigenvalues greater than 1.0 and a three factor solution accounted for 71% of the variability in the 16 variables. Loading of the variables on the rotated factors which were  $> 0.4$  are shown in Table 4.

The first component (49% of variance) was characterised by eleven items all concerned with the intra-operative experience (Table 4). This component was thereby entitled 'Intra-operative Apprehension'. The second component determined by four items accounted for 14% of the variance and concerned information provision (Table 4). This component was thereby classified as 'Anaesthetic Information Provision'. The third and final component explained 8% of the total variance and concerned patients apprehension regarding control (Table 4). This component was thereby termed 'Health Control'.

Utilising these three new variables, a significant positive correlation was found between Anxiety on the day of Surgery and Intra-operative Apprehension ( $r_2 = 0.58$ ,  $p < 0.001$ ), Anxiety on the day of Surgery and Anaesthetic Information Provision ( $r_2 = 0.34$ ,  $p < 0.050$ ) but not between Anxiety on the day of Surgery and Health Control (Table 5). When the three new variables were included in a regression analysis of anxiety on the day of surgery, only intra-operative apprehension and anaesthetic information provision on the day of surgery were significant predictors of anxiety levels, explaining 37% of the variance in anxiety ratings (regression parameters Table 6). Here the dependent variable (outcome) was 'Anxiety on the Day of Surgery' with the independent variables (predictors) being Intra-operative Apprehension and Anaesthetic Information Provision. The adjusted R squared value ( $R^2$ ) was taken to be

0.370 (Table 6). Thereby, it is suggested that 37% of the variance in ratings of anxiety on the day of surgery can be explained by the predictors Intra-operative Apprehension and Anaesthetic Information Provision. Moreover, this was not a chance occurrence as the analysis of variance demonstrates ( $p < 0.010$ ) (Table 6). Additionally, both Intra-operative Apprehension ( $p < 0.010$ ) and Anaesthetic Information Provision ( $p < 0.020$ ) achieved a satisfactory level of significance (Table 6). The results therefore suggest that apprehension relating to the intra-operative experience and anaesthetic information provision can to some extent, predict an overall higher level of anxiety on the day of surgery.

## **D i s c u s s i o n**

### *Study Limitations*

Limitations to the study were associated with the survey sample and patient self-reported questionnaires. Firstly, a number of participants within the sample ( $n=28$ ) did not undergo actual surgery. This may have influenced the data slightly although a decision was taken to include such participants as numerous invasive procedures are frequently undertaken in day surgery units and the apprehensions regarding such local/ regional anaesthesia may not differ greatly. A further issue concerning the sample was the low response rate (41%). However, such a response rate is not uncommon in postal surveys especially with a sample population who quickly resume their 'normal' lifestyle (Clark et al. 2002, Pandit and Davies 2005, Sri-Ram et al. 2006).

The second and final issue concerns the use of patient self-reported non-validated questionnaire., Further studies may therefore wish to explore the central issues raised here following the validation of an appropriate questionnaire. Studies may also wish to examine the patient's intra-operative experience in association with the views of the anaesthetic room, operating room and recovery room nursing staff. In this way, a broader view of peri-operative anxiety and the impact of the environment may be established. Although all the items utilised within the questionnaire were extracted from previous findings, the use of more open forms of data collection may prove somewhat more beneficial as not all aspects of anxiety experienced by patients may have been introduced.

### *Intra-operative Intervention*

The research question concerned the environmental factors, which most influenced anxiety for the conscious adult patient undergoing, elective day surgery. From an examination of the descriptive statistics, 77% of patients experienced some degree of anxiety (Figure 1). Therefore, the majority of participants within the study viewed their surgery with local/ regional anaesthesia as anxiety provoking (10% were either very anxious or extremely anxious). The descriptive statistics helped to demonstrate that issues concerning the intra-operative events were the most prominent source of this anxiety (Table 3). Similar findings were uncovered by

Costa (2001) when interviewing day surgery patients. They were apprehensive regarding their anaesthetic because of the fear of dying, loss of physical and emotional control or the possibility of seeing the body being cut open.

From these initial descriptive findings factor analysis was employed in order to produce a clearer pattern (Table 4). It was possible to classify the patients' experience of conscious surgery with three factors labelled 'intra-operative apprehension', 'anaesthetic information provision' and 'health control'. Intra-operative apprehension explained 49% of the variance in the original measures. A number of aspects were highly influential, that is, the thought of being awake, feeling the surgeon, seeing the body cut open, surgery being more painful because it is local/ regional anaesthesia and the numbness wearing off too quickly. Other studies have also uncovered similar findings regarding the anxiety associated with the possibility of feeling the surgeon (De Andres et al. 1995), viewing events, hearing intra-operative conversation (Gajraj et al. 1995) or experiencing increased pain (Koscielniak-Nielsen et al. 2002, Gajraj and Sidawi 1993). However, as healthcare professionals may be acutely aware, many of these apprehensions may be unfounded or would rarely be experienced. Nevertheless, the fundamental point here is that patients were unaware that such apprehensions were indeed false as they had either not been informed of the possible impact of the environment, had forgotten such detail or simply had no insight into such intra-operative experiences until they arose. With the predicted rise in the level of conscious surgery, the importance of future interventions designed to resolve such issues cannot be underestimated.

Historically, being informed in advance of events has aided the patients' ability to manage anxiety more effectively (Lee et al. 2003, Johansson et al. 2005). For example, the anaesthetist explaining events and being given prior notice of proceedings (sequential order of events) were beneficial in that it helped to reduce anxiety (Table 3). Other studies have likewise revealed such information and choice to be crucial in modern elective surgery (McKenna 1997, Ward et al. 2007, Gillies and Baldwin 2001). However, debate frequently occurs regarding the ideal time for the anaesthetist to visit patients to impart such information. In an experimental study by Twersky et al (1992) to examine optimal visiting times, no significant difference was established between two groups visited early (1 to 7 days pre-operative anaesthesia) or late, that is, on the day-of-surgery visit. "Our results suggest that visiting the anesthesiologist prior to the day of surgery does not reduce pre-operative anxiety, anesthetic requirements, recovery time, or frequency of post-operative sequelae in healthy ASA physical status I and II patients." (p. 206).

Communication with the nurse immediately prior to the administration of the anaesthetic mirrored the anaesthetist figures (Table 3) and was likewise viewed as beneficial in that it could help to reduce anxiety. Such personal contact of this nature has previously been suggested to be a vital component of intra-operative care (Rudolfsson et al. 2003, Leinonen and

Leino-Kilpi 1999, Leinonen et al. 1996). However, the complete eradication of pre-operative anxiety at such a time is somewhat unrealistic. Nevertheless, for some patients, a lack of insight into events and possible ensuing catastrophising thoughts may have contributed unnecessarily to their apprehension and thereby limited their ability to manage their anxiety effectively (Crockett et al. 2007).

Being in receipt of distinct anaesthetic information was the second identified factor with one aspect being highly influential - informed of how long the anaesthetic will last (Table 4). A number of studies have emphasised the importance of pre-operative information provision (Jakobsen and Fagermoen 2005, Tong et al. 1997) although such provision frequently becomes marginalised. "When a patient agrees to surgery, for example in the out-patient clinic, this is usually on the basis of information received from the surgeon about the intended procedure. Since the surgeon may not offer information about the anaesthetic technique, nor about the risks of anaesthesia, the patient generally agrees in principle to a procedure knowing very little about the anaesthetic that will be involved." (Parroy et al. 2003 p.15). Moreover, immediately before commencement of anaesthesia or during the initial stages of anaesthesia, the patient's inability to feel or move in the usual manner may become highly apparent (Bhattarai et al. 2005, Mauleon et al. 2007) and thereby they may wish to have a greater understanding of the course of the anaesthetic. Again, the importance of distinct anaesthetic information provision prior to the day of surgery must in the future be more formally addressed (Lack et al. 2003).

The third and final identified factor was labelled health control. Although the identified items could be viewed as information provision (Table 4), such aspects also centrally embrace issues concerning the regaining of personal control and independence. A number of studies have also suggested that patients require some choice or involvement in decision-making regarding their healthcare (Clements et al. 2004, Ward et al. 2007, Mitchell 2000). This may be especially true in modern elective surgery where patients view themselves as comparatively more autonomously than the traditional surgical in-patient. "The patient's demand for more care, on his/ her terms, at his/ her convenience is mirrored by the increasing desire for a guarantee of satisfaction." (Beals 2002 p.219). Again, with the increase in conscious surgery, this growing autonomous breed of patient may expect the opportunity for greater choice and control. **However, because only two variables were utilised in the construction of this third factor, a certain level of caution is required. Further studies may wish to examine this aspect in more detail employing an increased number of variables to examine 'health control' in more detail.**

Finally, these three new factors were entered into a multiple regression analysis to uncover their ability to help predict heightened anxiety on the day of surgery (Table 6). However, only two factors - intra-operative apprehension and anaesthetic information provision were significantly related to an overall level of increased anxiety on the day of surgery. Although

health control was not a significant predictor of increased anxiety, it may remain a central issue for intra-operative intervention and require further investigation in this context.

Patients employed in this study, who experienced an overall raised level of anxiety, were most apprehensive regarding the potentially adverse intra-operative experiences and the provision of distinct anaesthetic information. The evidence presented may suggest that patients concerned about potentially adverse intra-operative experiences and the provision of distinct anaesthetic information may experience an overall higher level of anxiety. Intrusive intra-operative thoughts may focus acutely upon being awake during surgery, feeling the surgeon, seeing the body cut, experiencing more pain or the numbness wearing off too quickly. Conversely, patient apprehension in relation to distinct anaesthetic information provision may acutely focus upon gaining sufficient knowledge regarding how long the anaesthetic will last and the time taken for the numbness will take to wear off. Future studies may wish to examine such experiences alongside the possible influence of the physical environment, that is, temperature, noise, comfort and darkness, in order to confirm the importance of the experience of surgery on the conscious self.

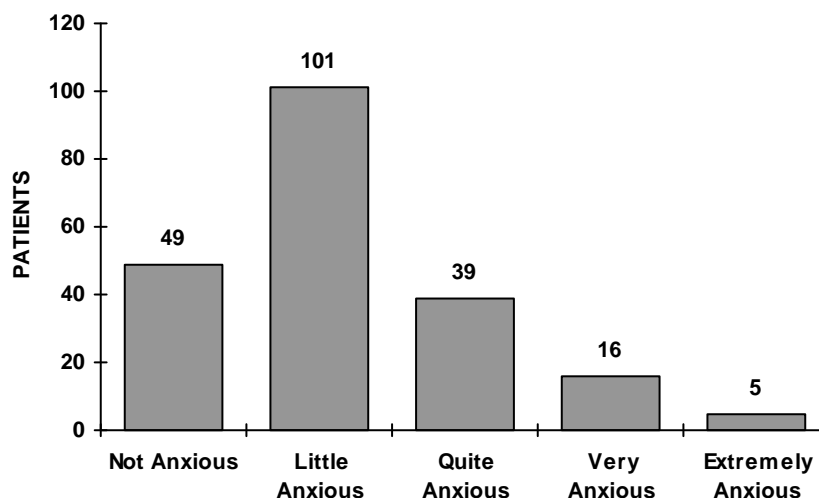
Clearly, such evidence requires further investigation in order to firmly establish the need to implement more formal nursing intervention in relation to such events. However, a number of studies have already highlighted the need for increased psychological support both intra-operatively (Leinonen and Leino-Kilpi 1999, Fung and Cohen 2001) and peri-operatively (Gilmartin and Wright 2007, Rhodes et al. 2006, Stoddard et al. 2005). Although improved anxiety management and information provision are recommended here, essentially both aspects crucially involve personal communication and education. In the new surgical era, described earlier, in which patients increasingly have less contact with healthcare professionals, require comparatively less physical care but more psychological support (Mitchell 2007), improved communication and education appears vital.

## **C o n c l u s i o n**

It is now increasingly common for patients in many countries throughout the world to experience intermediate surgery under local/ regional anaesthesia having remained in the acute healthcare setting for only a few hours. This transformation in elective surgical healthcare signals considerable change for traditional surgical nursing. The evidence presented here helps to demonstrate the changing management and needs of patients undergoing elective, surgery under local or regional anaesthesia. Such limited contact may necessitate the utilisation of far more formal aspects of psychological nursing intervention in modern elective surgery, that is, planned intervention to aid intra-operative anxiety and to deliver distinct anaesthetic information in a timely manner. This may require the introduction of more formal nursing assessment in the pre-assessment clinics to help dispel the possible myths associated with local and regional

anaesthesia. Moreover, the continued development of the 'conscious patient friendly' theatre environment is vital if more patients are to experience (or be encourage to experience) local and regional anaesthesia. Further studies to develop the themes arising from this study are clearly required especially studies which seek to compare differing intra-operative theatre environments.

**FIGURE 1**  
**ANXIETY ON DAY OF SURGERY (n=210).**



**TABLE 1**  
**ITEMS CONCERNING INTRA-OPERATIVE EXPERIENCE.**

- 1) How would your anaesthetist explaining your anaesthetic before going to theatre affect your anxiety?
- 2) How would a nurse explaining your anaesthetic on the ward before going to theatre affect anxiety?
- 3) How would being told how long your anaesthetic will last affect your anxiety?
- 4) How would being told how soon the numbness will take to wear off affect your anxiety?
- 5) How would being told how soon you will be able to eat and drink again affect your anxiety?
- 6) How would always being told what was to happen next affect your anxiety?
- 7) How did the thought of possibly needing more than one injection to numb your skin affect your anxiety?
- 8) How did the thought of possibly needing a drip (intravenous infusion) affect your anxiety?
- 9) How did the thought of being awake during the operation affect your anxiety?
- 10) How did the thought of possibly hearing what the doctors and nurses were saying in theatre affect your anxiety?
- 11) How did the thought of possibly feeling what the surgeon was doing in theatre affect your anxiety?
- 12) How did the thought of possibly seeing your body 'cut open' affect your anxiety?
- 13) How did the thought of the operation possibly being more painful because you were awake affect your anxiety?
- 14) How did the thought of the numbness possibly wearing off before the operation was finished affect your anxiety?
- 15) How did the thought of possibly feeling 'closed in' (claustrophobic) during the operation affect your anxiety?
- 16) How did the thought of the pain possibly being worse afterwards because only a part of your body was being made numb affect your anxiety?



**TABLE 2**  
**TYPE OF SURGERY UNDERTAKEN (n=209).**

PROCEDURE	CASES
General Surgery	77 (37%)
ENT Surgery	13 (6%)
Orthopaedic Surgery	73 (35%)
Urological Surgery	18 (9%)
Pain Management	24 (11%)
Medical Investigation	4 (2%)

**TABLE 3**  
**RESPONSES ON LIKERT SCALE FOR ITEMS RELATING TO INTRA-OPERATIVE ANXIETY (n=214).**

ITEM	VERY ANXIOUS	A LITTLE ANXIOUS	NO DIFFERENCE	A LITTLE CALM	VERY CALM
1) Anaesthetist explaining.	1%	7%	29%	40%	24%
2) Nurse explaining.	0%	7%	39%	36%	18%
3) How long anaesthetic last.	1%	9%	41%	30%	19%
4) How long numbness last.	1%	8%	41%	30%	19%
5) Told when can eat & drink.	1%	1%	60%	17%	21%
6) Told what will happen next.	1%	11%	32%	35%	21%
7) Thought >1 injection.	9%	31%	23%	2%	3%
8) Thought IVI.	8%	17%	17%	1%	1%
9) Thought being awake.	15%	45%	16%	1%	3%
10) Thought hearing staff.	5%	18%	28%	8%	9%
11) Thought feeling surgeon.	15%	45%	16%	1%	3%
12) Thought seeing body cut.	19%	28%	13%	0%	2%
13) Thought more painful.	17%	44%	14%	0%	1%
14) Thought numbness wearing off too quick.	17%	36%	8%	1%	1%
15) Thought claustrophobia.	5%	11%	15%	0%	1%
16) Thought pain worse after.	6%	35%	15%	1%	1%

**TABLE 4**

**LOADINGS >0.4 ON THE ROTATED FACTORS FROM THE 3 FACTOR MODEL FOR THE INTRA-OPERATIVE EXPERIENCE OF CONSCIOUS SURGERY (N=210).**

	Factor 1	Factor 2	Factor 3
Thought of needing more than 1 injection	.577		
Thought of needing intravenous infusion	.517		
Thought of being awake during operation	.824		
Thought of hearing during operation	.694		
Thought of feeling surgeon during operation	.826		
Thought of seeing body cut open	.888		
Thought of RA/ LA being more painful	.893		
Thought of numbness wearing off too quickly	.870		
Thought of claustrophobia	.683		
Thought of pain being worse for RA/ LA	.765		
Anaesthetist explaining anaesthetic		.716	
Nurse explaining anaesthetic	.489	.740	
Told how long anaesthetic will last		.914	
Told how long numbness will last		.780	
Told when can eat and drink			.714
Told what will happen next			.759

**TABLE 5**

**CORRELATION ( $r_2$ ) MATRIX OF ANXIETY ON THE DAY OF SURGERY, INTRA-OPERATIVE APPREHENSION, ANAESTHETIC INFORMATION PROVISION AND HEALTH CONTROL.**

	INTRA-OPERATIVE APPREHENSION (Factor 1)	ANAESTHETIC INFORMATION PROVISION (Factor 2)	HEALTH CONTROL (Factor 3)
Anxiety on the day of surgery	0.577**	0.399*	-.182

\* $P < 0.05$  \*\* $P < 0.001$

**TABLE 6****MULTIPLE REGRESSION (N=210) CONCERNING FACTORS CONTRIBUTING TO ANXIETY ON THE DAY OF SURGERY.**

FACTOR NUMBER	BETA	t-STATISTICS	P-VALUE
1) Intra-operative apprehension	.536	3.761	0.001
2) Anaesthetic information provision	.347	2.437	0.021

$F = 10.099$ ,  $P < 0.001$ ,  $R^2 = 0.411$ , adjusted  $R^2 = 0.370$ .

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