

# ความวิตกกังวลของผู้ป่วยที่ได้รับการตรวจวินิจฉัยโรคด้วยคลื่นสนามแม่เหล็กไฟฟ้าเป็นครั้งแรก

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## บทคัดย่อ

การตรวจวินิจฉัยโรคด้วยคลื่นสนามแม่เหล็กไฟฟ้า หรือ Magnetic Resonance Imaging (MRI) เป็นวิธีการที่นิยมใช้มาก ในการวินิจฉัยทางการแพทย์ในปัจจุบัน อย่างไรก็ตามผู้ป่วยหลายคนที่ได้รับการทำ MRI เป็นครั้งแรกอาจจะมีความรู้สึกกลัวและวิตกกังวล ส่งผลให้บางคนเคลื่อนไหวร่างกายไม่อยู่นิ่ง ทำให้ผลที่ได้ออกมาไม่สมบูรณ์ อาจทำให้ต้องเริ่มกระบวนการ MRI ใหม่อีกครั้ง ซึ่งก็จะส่งผลให้ผู้ป่วยรู้สึกวิตกกังวลเพิ่มขึ้นไปอีก ในวรรณกรรมที่เกี่ยวข้อง มีการกล่าวถึงความรู้สึกของผู้ป่วยที่ได้รับการทำ MRI เป็นครั้งแรกค่อนข้างน้อย ดังนั้นบทความนี้จึงแสดงถึงผลด้านจิตใจในระหว่างการทำ MRI โดยเฉพาะอย่างยิ่ง ความวิตกกังวล ความตื่นตระหนก ความกลัวที่แคบ กรณีตัวอย่างที่ยกมาจะช่วยให้ผู้อ่านเข้าใจความคิด ความรู้สึกของผู้ป่วยจากมุมมองของผู้ป่วยเอง นอกจากนี้ยังมีคำแนะนำที่จะช่วยลดความวิตกกังวลของผู้ป่วยในระหว่างการทำ MRI

**Keywords:** MRI ความวิตกกังวล ความตื่นตระหนก ความกลัวที่แคบ

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## Anxiety during 'First Time' Magnetic Resonance Imaging

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## Abstract

Magnetic Resonance Imaging (MRI) is currently the most preferred method of medical diagnostic imaging. However, many patients undergoing 'First Time' MRI have a fear of it and the heightened levels of anxiety. As a result, the patient may have movement that causes artifact in the MRI results and thus need longer process and the distress of the patient can be higher. There is limited information in literature of a 'First Time' MRI scan from the adult patient's perspective. Thus this article demonstrates the psychological effects, particularly anxiety, panic and claustrophobia caused by the MRI procedure. A case example is described to reveal thoughts and feelings from a patient's perception. Recommendations to reduce the patient's anxiety during the MRI process are outlined.

**Keywords:** MRI, anxiety, panic, claustrophobia

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## Magnetic Resonance Imaging for the ‘First Time’ A patient experience

“Breathe in and hold!” and then “Breathe out!” were the instructions given by a nurse who was a glamorous lady immaculately attired with reminiscent of ‘Star Trek’. In front of her was a thin 67 years old English man wearing a patient gown. He is identified as Mr. G. The nurse observed his abdomen thoroughly without comment, and then left him alone. Verbal instructions to the patient were then provided step by step. However, he wondered if written information prior to the procedure wouldn’t have been more appropriate.

After about ten minutes, the patient was taken to the scanning room and invited to lie down. While lying down, he noted with some relief that the tube was not as long as he himself, perhaps only four feet. He was shown the headset and had plastic frames placed on his abdomen. The frames were strapped in place, which was slightly painful as he had a stomach ache. With the headset adjusted into a proper position he was driven towards the tube. Considering that the patient is an active sportsman who likes competitive activities such as aviation and scuba diving, to be trapped in a narrow tube was most unpleasant.

It was the first time in his life that he had had an MRI investigation. His idea about it was based mainly on descriptions given by family members, one a retired nurse, who had had an MRI scan and described it as ‘very noisy and not able to move in a very small tube’ and something which ‘needs courage and not everybody could do – some people require a sedative’.

Mr. G, having learned about the indication for an MRI scan at short notice, had little time for consideration. His concern about the potential illness, being in a foreign country like Thailand and having no immediate family nearby placed him in a somewhat stressful situation. All

the information he could gain was from the Internet regarding usual time (30 minutes) and having a ‘microphone, headset and a panic button’.

Now, lying in the tube, he realized that he had no microphone. He asked for one and the staff said “In the room”. The patient tried to point to his mouth (microphone) but was pinioned by the arms, so he couldn’t. He experienced ‘minor panic’ which became worse with an itchy nose. One staff member probably noticed the patients struggling hands and put a rubber ball into his right hand. For some reason, the patient was then extracted from the tube and the frame on the abdomen moved a significant distance towards his feet.

After being strapped in the second time, the patient was asked “Are you OK?” and without waiting for a response, motored back into the tube. The patient felt less stressed, knowing the tube was not as ‘figure hugging’ as first anticipated and he noticed a silver line above. Determined to remain calm, the patient decided to close his eyes and just feel and listen. The sound was loud, but not the ‘machine noises’ anticipated. He tried to imagine the machinery making the noise and decided it was most like the sound of an air conditioner. He could feel a draft. There were also loud buzzing noises of varying pitches and he wondered if it was different parts of the machinery or the different pitches had some meaning for the staff. The trolley stopped which he felt was a bad sign, not knowing what to expect. His anxiety was somewhat diminished when he heard the instruction “Breathe in” and then “Hold” but it seemed like a long time before he heard “Breathe out”.

Mr. G was a bit worried because after the “Hold” instruction, there were a lot of new buzzes and klaxons. He did not have time to finish breathing in and holding before the noises started and worried if the ‘scanning’ would be unsuccessful meaning more time in the

machine, and more expense? The sequence was repeated several times and sometimes he could feel the trolley moving through the tube. The patient decided to open his eyes. The silver strip was still there, but he had no idea 'how far into the tube he was'. It was unpleasant not knowing, so he closed his eyes again. He also wondered, on frequent occasions, how far through the 30 minutes he was. On a couple of occasions, there were what seemed to be long periods of inactivity.

On one occasion, after the 'breathe in and hold sequence' the trolley jumped up and down and vibrated and the sounds were much more 'angry' but when the jolting stopped, the trolley seemed to move quite a long distance raising hopes the process was finished, but it wasn't. However, because he was learning the sequence now – buzzes, breathe in, louder activity and stop, the patient was feeling a little more relaxed. In fact another itch occurred (in the private regions), but being more settled, he found it easy to tolerate. However, at one point in time, there was an unclear instruction in the headphones. He shouted "I can't hear you" which was ignored. About that time, he thought of the 'panic button' only to realize it was not in his hand. The realization he did not have the panic button triggered the question 'If I pressed it what would happen? Would I have to pay for a new scan? Would they just do the last bit again?' There was another instruction shortly after which the patient thought was "Breathe normally" but it did not mean the scan was over as there were one or two more 'scan' sequences.

Eventually the process came to an end although there was no 'warning' just that suddenly he could see bright light through his eyelids.

As soon as Mr. G was released, he made the notes for this report hoping to calm his nerves.

## Psychological reactions to Magnetic Resonance Imaging

The aforementioned situation is not unusual for the patients who experience the 'First time', Magnetic Resonance Imaging (MRI). Since the first body exam on a human being in 1977, MRI has gained a reputation as the preferred method of imaging for a large range of medical diagnostic purposes, particularly cancers and similar type ailments. Although MRI is noninvasive, some patients experience feelings of fear, anxiety, and claustrophobia<sup>1-3</sup>. Reasons for this uncomfortableness are the visually enclosed appearance of the equipment, the discomfort due to the requirement to remain still during the scan for up to and beyond one hour, and the fact that many patients are experiencing the procedure for the 'First Time'. These feelings add to the patient's general concern about the potential disease which is the reason to perform MRI. Therefore, some patients even suffer from panic, leading to premature termination of the MRI process due to motion artifact.<sup>4</sup> Among patients undergoing MRI, 4-30% experience anxiety<sup>2</sup> and 1-15% suffer from claustrophobia.<sup>1</sup> Approximately 3-5% of patients had to stop the MRI process because of anxiety and 14.2% needed sedation; the level of anxiety was similar to patients facing surgery.<sup>5</sup> Risk factors for the development of claustrophobia include female gender, and age between 40-65 years.<sup>1</sup> A large-scale cohort retrospective study including 5,798 MRI reports was conducted.<sup>4</sup> Of 4,821 patients, 95 (1.97%) suffered from claustrophobia causing premature termination of the MRI procedure in 59 patients (1.22%).<sup>4</sup> Sedation and prone positioning might help overcome these reactions.

Nowadays patient-friendly MRI machine such as open scanner have been developed to reduce fear and anxiety of patients. However, open MRI machines cannot do some types of scan and the quality of the image may

be slightly inferior to the standard machines.<sup>6</sup> More importantly, These devices not available in every MRI center in Thailand. Physicians, nurses and medical staff should therefore prepare their patients in order to prevent or minimize psychologically demanding effects.<sup>1</sup>

### How to relief anxiety during MRI?

Though the MRI process nowadays has been developed to be “patient friendly”, patients still experiencing fear and lack of self-control.<sup>5</sup> There are several methods to prevent or relieve anxiety reported in the literature. Quirk et al.<sup>7</sup> conducted exit interviews of 40 patients after undergoing MRI. They found that anxiety was associated with the constrictive dimensions of the magnet bore, examination duration, coil noise, and temperature within the bore. Preparation at the point of referral was consistently absent, incomplete, or misleading. Patients used identifiable strategies to cope with the examination: blinding, breathing relaxation techniques, visualization of pleasant images, and performance of mental exercises.<sup>7</sup>

In another study,<sup>8</sup> attempts had been made to reduce anxiety of the patients undergoing MRI. The control group comprised 35 neurology and neuropsychiatry patients undergoing standard procedure of brain or spinal scans with limited information given. In the experimental group, 29 patients received a booklet giving information about the scanning procedure and advice on cognitive strategies for anxiety reduction, a tape-recorded demonstration of scanner noise, a visit to the control room before entering the scanner, a device to signal for adjustment of music volume, precise timings of each scan, and a clock visible during scanning. Anxiety was measured by using mean anxiety ratings made during the imaging procedure and by retrospective State Anxiety scores immediately after leaving the scanner. During the scan, anxiety level of the experimental group was significantly less than the control. The results showed that

the anxiety of the patients undergoing MRI can be reduced with such protocol that does not require special training of staff and no disruption of the MRI procedure.

Based on the literature, some methods may be useful for staff of the MRI center to prepare their patients for an optimal outcome. Useful technique may include:

**1. Providing information:** providing factual data about the process and giving information and briefing prior to the scan would be beneficial. Textual and pictorial details including the diameter and length of the tube, describing the headset and the location of a microphone are useful. Emphasizing the zero side effects and the quality of graphics of the MRI compared with x-rays could convince the patient about the need of the procedure.

**2. Communication:** providing the working two-way communication device should help releasing patients’ anxiety. The verbal instruction should be clear and the staff should response to the patient’s signs. Knowing how long to hold one’s breath could have been explicated by “hold for 25”, for example.

**3. Rehearsal:** showing an audio or video clip of the MRI procedure would help the patient to be prepared for the noise. For high anxiety patients, a plywood mock-up prior to the MRI will give the opportunity for a minimal cost “simulator scan” under their own control. However, such a device requires additional room, costs and manpower, which need to be considered in light of potential gain.

**4. Relaxing techniques:** training patients to control their anxiety or preparing them prior to the scan is useful. Relaxing technique such as guided imagery (imagining about pleasant scenery, sound and smell)<sup>9</sup>, pray or doing meditation can be helpful to relief anxiety<sup>10</sup>. Aromatherapy can be a good method to lessen the patient’s anxiety.<sup>11</sup> Cognitive behavioral approach has shown to be effective to reduce anxiety during the MRI scan.<sup>12</sup>

**5. Monitoring during the scan:** for sudden anxiety, advice about what to do in case of panic and how quickly patients can be released is useful information. During the scan, a device such as a clock for the patient to monitor elapsed time and time to go, or to know their “position in the tube” is important.

**6. Medication:** if needed, sedation could be prescribed to calm the patients’ nerve in case of panic attack or claustrophobia.

## Conclusion

The above described experience of a single patient emphasizes the importance of fear of the unknown or lack of knowledge. Good preparation of patients may help reducing anxiety. Thus the MRI procedure can complete without prolong time and cost.

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