## Premenstrual syndrome and its psychiatric ramifications

To the Editor: The article by Drs. Perveen Rasheed and Latifa Saad Al-Sowailem is interesting and the first of its kind that describes the prevalence and predictors of premenstrual syndrome in Saudi Arabia.1 However, we have reviewed the literature on premenstrual syndrome [PMS] and premenstrual dysphoric disorder [PMDD].<sup>2</sup> Further, we have also reported five cases of PMS and its psychological connections to premenstrual dysphoric disorder.3 In a related development, Al-Habeeb also briefly reviewed the pertinent data and reported a case of premenstrual manic disorder, and based on four reported cases in the world literature, proposed tentative research diagnostic criteria.4 We observed that the two premenstrual syndromes with specific differentiating symptoms were etiologically attributed best to the dysregulation of central serotonergic and gabaergic systems and the noxious sex steroid hormonal milieu during normal cyclical ovulation. Further, the women with these syndromes, who need proper assessment, tests, and a correct diagnosis, respond effectively to selective serotonin-reuptake inhibitors, gonadotrophin-releasing hormone agonists, a novel contraceptive pill-Yasmin, cognitive-behavior therapy, life-style changes, and in addition, placebo. The oral contraceptive pill-Yasmin contains low-dose (30 microg) ethinylestradiol (EE) combined with a new progestogen, drospirenone (3 mg) (DRSP) and it offers better clinical efficacy for PMS/PMDD as a result of the unique pharmacological profile of this progestogen, which is a 17alpha-spirolactone derivative with antimineralocorticoid and antiandrogenic activity. Notably, DRSP resembles endogenous progesterone. Unlike other oral contraceptives, it has very minimal effects on skin, appetite, food craving, mood changes

and breast tension and also improves general well-being together with a positive effect on oral contraceptive continuation.<sup>5,6</sup> We concluded that premenstrual psychiatric spectrum syndromes coupled with multiple adverse consequences are important clinical entities in a woman's reproductive life, and need timely intervention and further research, especially in Arabian Gulf countries.

With special reference to this study,1 we would like to make some comments that may have both research and clinical relevance. First, this study reported that mothers of probands were suffering from PMS [45.4%] and a family history of depression or mental illness was revealed in 46.9% of women with PMS. Here, our main concern is how mothers of the study group make sure that they were suffering from PMS. Did they themselves make this diagnosis, or after consulting a gynecologist? Similar questions may be evoked in relation to depression or other mental disorders reported in their families. Notably, both PMS and PMDD are diagnoses of exclusion. However, most importantly the implication of the former finding is that these college women might have learned of PMS symptoms from their mothers, as also reported in the literature.7-9 With regard to depression, it is commonly reported in families or patients with PMS who have co-morbid depression [86%] and an array of other psychiatric disorders and physical disorders.7,10 PMS has a reciprocal relationship with depression. Hence, clinicians should screen patients with PMS for co-morbid depression, which is known to have a detrimental effect on women's mental and physical health.

Second, this study has taken into consideration the timing of premenstrual symptoms one week prior to the onset of menstruation and generally ending a couple of days before periods or at the commencement of periods. Indeed, this definition is not typical of PMS and one may ask the question: are the women whose symptoms remitted mid-menstruation rather than at the commencement of menstruation not suffering from PMS? Evidently, PMS symptoms typically remit midmenstruation<sup>7,11</sup> and therefore this study might have missed many true cases of PMS, though the reported prevalence [96.6%] is congruous with international studies. Conversely, this study might have picked up many false cases of PMS as well.

Third, the authors chose thirteen PMS symptoms and readers like myself would be interested to know whether these PMS symptoms, out of 100 reported PMS molimina, were the most frequently reported in the literature or were stable across premenstrual cycles.11 Also, what is the reliability and validity of the PMS symptoms questionnaire? However, this question may not have much relevance because in the absence of other gynecological, medical and psychiatric disorders,<sup>2,7</sup> one or two symptoms are sufficient for the diagnosis of PMS. But from the perspective of future research on PMS, it would have been much better to append the questionnaire with the article. Space constraint in this journal might have discouraged this possibility. For informing prospective researchers, Budeiri and colleagues have comprehensively described various relevant scales used among patients with PMS.12 Recently, Steiner and colleagues have developed an effective screening tool for operationalizing DSM-IV criteria for PMDD and to understand clinically significant PMS.13

Fourth, PMS and PMDD have overlapping symptoms, similar etiological underpinnings and treatment modalities. According to this study, 37.9% of women [n=176/464]had a high PMS score of 10-33. In view of this, a proportion of these college women, i.e., about 3% to 18%, might be suffering from PMDD,<sup>14</sup> which has proposed research diagnostic criteria.<sup>15</sup> These research diagnostic criteria for PMDD take into account the past year during which premenstrual symptoms [in most cycles] occur during late luteal phase and remit within a few days after the onset of the follicular phase and are absent in the week post-menses. Another syndrome related to PMS is seasonal PMS.

Finally, in light of these comments the findings of this study should interpreted cautiously be and generalization of the findings should be restricted. In Arabian Gulf countries, PMS is a fertile avenue for future research. So, I would like to suggest that an Arabian Gulf PMS/PMDD Research Group should be formed for exploring premenstrual obstreticgynecological/psychiatric spectrum disorders, puerperal psychosis, postpartum depression, and other postpartum psychiatric disorders.

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### References

1. Rasheed P, Al-Soweilem LS. Prevalence and predictors of premenstrual syndrome among College-Aged women in Saudi Arabia. Ann Saudi Med. 2003; 23: 381-387.

2. Qureshi NA, Al-Habeeb TA. Making gynecological and psychiatric sense out of Premenstrual pains, tension and dysphoria: A review of literature. Saudi Medical J. 2004 [in press].

3. Qureshi NA, Al-Habeeb TA. Premenstrual syndrome: Dissecting its psychological connections through five cases. Arab J Psychiatry. 2004 [in press].

 Al-Habeeb TA. Premenstrual manic disorder: review of literature, case report and the efficacy of Trifluoperazine. Arab J Psychiatry. 2004 [in press].

5. Mansour D. Experience with Yasmin: the acceptability of a novel oral contraceptive and its effect on well-being. Eur J Contracept Reprod Health Care. 2002; 7 Suppl 3:35-41; discussion 42-43.

 Freeman EW. Evaluation of a unique oral contraceptive (Yasmin) in the management of premenstrual dysphoric disorder. Eur J Contracept Reprod Health Care. 2002; 7 Suppl 3: 27-34; discussion 42-43.

7. Connolly M. Premenstrual syndrome: an update on definitions, diagnosis, and management. Advances Psychiatr Treat. 2001;7: 469-477.

 Marvan ML, Diaz-Erosa M, Montesinos A. Premenstrual symptoms in Mexican women with different educational levels. J Psychol.1998;132: 517-526.

9. Anson O. Exploring the bio-psycho-social approach to premenstrual experiences. Soc Sci Med. 1999;49: 67-80.

10. Hsiao MC, Liu CY, Chen KC, Hsieh TT. Characteristics of women seeking treatment for premenstrual syndrome in Taiwan. Acta Psychiatr Scand. 2002; 106: 150-155. 11. Bloch M, Schmidt PJ, Rubinow DR. Premenstrual syndrome: evidence for symptom stability across cycles. Am J Psychiatr. 1997; 154: 1741-1746.

 Budeiri DJ, Li Wan Po A, Dornan JC. Clinical trials of treatments of premenstrual Syndromes: entry criteria and scales of measuring treatment outcomes. British J Obstet Gynecol. 1994;101: 689-695.

 Steiner M, Macdougall M, Brown E. The premenstrual symptoms screening tool (PSST) for clinicians. Arch Women Ment Health. 2003;6:203-209.
Halbreich U, Borenstein J, Pearlstein T, Kahn LS. The prevalence, impairment, impact, and burden of premenstrual dysphoric disorder (PMS/PMDD). Psycho neuroendocrinology. 2003; 28 Suppl 3: 1-23.

15. American Psychiatric Association. Diagnostic and Statistical Manual of Mental Disorders. Fourth edition. Washington DC: APA; 1994.

## Reply

To the Editor: We would like to thank Dr. Naseem Qureshi for his comments and would like to respond to some of the issues raised by him. The first issue pertains to the diagnosis of premenstrual syndrome (PMS) among mothers of the study subjects. In our study we requested that the college women to make enquiries from their mothers as to whether they suffered from PMS as diagnosed by a physician or as per the criteria suggested by us. In a population-based study, it was not possible to be more precise about the maternal diagnosis of PMS. We agree with Dr. Qureshi that "these college women might have learnt PMS symptoms from their mother." It might be noted that there are shared biological, psychological and environmental factors that influence the mother-daughter relationship such as expectations and self-perceptions<sup>1,2</sup> and this may explain the observations made for mother/daughter dyads. This point was mentioned by us in the article. Data on a family history of depression and mental illness in our study was also a self-report by the study-population. Information is sometimes collected by this method in public health research and one does make allowances in judgment for this inherent limitation.

The second issue relates to the timing of the premenstrual symptoms. In the definition adopted by us we mentioned that the symptoms remit two days prior to or "at the commencement of menses". According to the American College of Obstetrics and Gynecology, PMS symptoms occur in the luteal phase and disappear " as a woman's period starts."<sup>3</sup> Lurie and Borenstein in their study have defined PMS and specifically mention that the symptoms "disappear a few hours after onset of menstruation."<sup>4</sup> Others too had adopted the same definition as ours.<sup>5</sup> Definitions, however are revised from time to time and there may be slight variations in the definition by different authorities.

The third issue which interests Dr. Oureshi is the choice of the 13 PMS symptoms selected by us. After reviewing several research papers on this subject, we selected the symptoms most frequently reported for this condition. Moreover there was the "other" category for women to report any symptom not mentioned by us. The symptoms included the following: headache, breast swelling/pain, general oedema, acne, binge eating, craving for sweet/ salty foods, constipation, tiredness, irritability, mood swings, anxiety, insomnia and depression. I agree with Dr. Qureshi that space constraint in journals prevents authors from attaching the questionnaire with their article. We will send the questionnaire to interested people upon request.

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#### References

1. Freeman EW, Sondheimer SJ, Rickels K. Effects of Medical History Factors on Symptom Severity in women meeting criteria for premenstrual syndrome. **Obstet Gynecol.** 1988; 72: 236-239.

 Wilson CA, Turner CW, Keye WR Jr. First born adolescent daughters and mothers with and without premenstrual syndrome: A comparison. J Adolesc Health. 1991;12: 130-137.

3. American College of Obstetrics and Gynecology. http: //www.acog.org

4. Lurie S, Borenstein R. The premenstrual syndrome. Obstet Gynecol Surv. 1990; 45: 220-228.

5. Rossingnol AM, Bonnlander H. Caffeine-Containing Beverages, total fluid consumption and premenstrual syndrome. Am J Public Health. 1990; 80:1106-1110.

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## **Arabian Traditional Healer**

To the Editor: In his recent article, Dr. Abdul Razzak (October 2003, pages 289-290) takes to task traditional healers and urges that patients should be protected "from intimidation and abuse." "Healers," he further adds, "should be prevented from confusing the patient and family by specifying supposedly divine, but unknown conditions as the cause of the patient's illness."

Psychiatry is a complex subject. Much of it is little understood. Actiology of most major mental unclear. illnesses remains Even the specificity of the syndromes is debatable. The truth is that there is very little evidence-based psychiatric medicine. Sir William Osler, a great Victorian physician is known to have described physicians as "like eggs, either good or bad." The same I suggest applies to Arabian traditional healers. They have, however, served the psychiatrically ill from time immemorial. Historically mental illness was and is still deemed by some to be a manifestation of evil. Traditional faith healers use the person's inner resources, their faith, in overcoming disease. Going to sacred places and devotion to a sacred object is known to restore health, which is in fact no different than going to a health spa or bathing in holy waters. Hundreds and thousands of my countrymen visit Lourdes in France to achieve a miracle. Pilgrims by immersion in the Euphrates (Iraq), Pharpar in Damascus Syria, the River Jordan (Palestine), Tiber(Italy), Nile (Egypt), Ganges Jumna Sarasvati in India have achieved purification, cure of disease and protection against further illness.

Almost every religious founder, Saint and Prophet has been credited with special powers to heal either as a demonstration or a consequence of their holiness. In every culture and in every continent there are specialist/healers who have gone through extraordinary initiations and much training that confers on them special powers. These individuals – "medicine men/shamans, folk doctors, voodoo men of Africa, Phanda men of the Orient" – do healing through concentrating their energies in winning the confidence of the patient and helping them to regain health.

Faith is an inner attitude of mind, a trust. It is the faith/trust that urges us to seek help from a given person. Healers either medically qualified or otherwise trained attract clients/ patients because of this innate quality. Call it trust, empathy, special psychic power or whatever, it helps the healer to achieve a positive change, in the recipient.

In Christianity and Islam, faith is equated with trust. The Christian First Letter to Corinthians asserts that faith is a gift of the God (1 Cor 12: 8-9). In Islam, faith (Arabic Imam) sets believer apart from others. "None can have faith except by the will of Allah" (The Holy Quran Surah 10 (Yunus) - 100). In Buddhist and Hindu yoga traditions, recommended inner attitudes are attitudes of trust in Guru or a spiritual preceptor. The "trust," (Pali Saddha, Sanskrit Sraddha) in Buddhism is comparable to the confidence which an ill person declares and thus entrust himself to the healer. It is the faith that leads an individual in need of help to seek it from another. Technically trained, and with abundant factual knowledge present-day clinician alas are low on one other essential; the healing power. This, traditional healers, good ones, use to such great advantage.

Traditional healers heal through faith in their art and the faith in them of those who seek their help. Faith, trust, and confidence are all aspects of healing that are exploited by traditional healers in making the patient well and restore him to health.

Psychiatry must not be elitist. It must look at itself more critically. Misdiagnosis and mistreatment is not uncommon within this speciality. Long-term medication with potent psychotropic drugs has created more complications and misery for our patients than the gentle art of healing practiced by "good" faith healers. Rather than preventing them from offering help to the mentally ill, we should be endeavouring to work with them and to learn from the divine art of healing.

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# Challenges in creating the educated surgeon in the 21st century: Where do we stand?

To the Editor: Improved performance, which remains a constant concern in the health service and places a heavy burden and responsibility on health planners, has become an increasingly difficult task in view of the fast changes in society in general and medicine in particular.1 The rate of change in medicine nowadays resembles those associated with the Industrial Revolution in England, 150 years ago.<sup>2</sup> In the field of surgery, two major changes have occurred: the increasing importance of less invasive technologies, and the growing awareness of the importance of "systems" in surgical care. To cope with these challenges, the traditional educational strategies in surgery need to be altered to keep pace with recent developments in minimally invasive surgery.

We examined problems in the current surgical residency training programme (SRTP) at King Khalid University Hospital (KKUH) by two approaches: 1) a quantitative semi-structured focus group study conducted through direct contact with

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the individuals involved in the SRTP, including 11 residents, 3 programme directors, and 7 consultants involved in the training and education of the trainees, and 2) a review of the literature on problems in surgical education and training, using a computer-based literature search (Medline).

Most of the residents in the current surgical training program agreed that there are a limited number of clinical cases for practice and training, and that they are not satisfied with the quantity and quality of operations they are performing during their training as first surgeons. They also think that a resident off-day and a study leave should be made mandatory to enable them to attend conferences, symposia and surgical courses. Programme directors and consultants emphasized that the number of cases for practice and training of residents is small. They think that our senior surgical residents do not show full competence after graduation and cannot be relied upon to perform many major operations with confidence. They suggested that effort should be made to find alternatives in training to fill the current deficiencies and to cope with the shortage in clinical cases. They also emphasized importance of one-toone contact, especially for the junior residents.

The decreasing patient population continues to be a major concern in many other surgical programmes<sup>7</sup> and has created a need for formal training outside the operating theatre.<sup>8,9</sup> The lack of full competence in graduate surgical residents has also been documented in other programmes.<sup>10-11</sup> Weigett et al11 in 1998, in a large survey of 954 general surgeons involved in the training of surgical residents, concluded that changes were needed because the current system of resident education allows chief residents to graduate with significant deficiencies in their education. Alternatives have been suggested for many surgical programmes, 12-15 but not in our programme. There is very little locoregional data regarding the current surgical residency training programmes to reflect such problems and then to raise proposals to improve performance and outcome.

Medical education continues to face pressure to re-engineer itself. These pressures include the decreasing patient population at academic medical centers, competing care systems, correlating student output with market needs, identifying the best way to train physicians, and the best location for training.16-21 Rapid developments in technology have generated an increasing need to develop methods of technical skills instruction outside the operating theaters, in the form of courses or workshops,24 which are now considered a mainstay of continuing education programmes for surgeons. Some training programmes provide sporadic teaching and practice opportunities for their residents outside the operating room.25,26 Lossing et al, detailed the technical skills programme for first-year residents in general surgery,25 which consisted of introductory didactic sessions and wet labs. The latter included instructions on the preparation of the patient and draping, aseptic technique, the principles of bowel anastomosis, incisions, the use and handling of instruments, principles of hemostasis, intraoperative surgical emergencies, surgical assisting and theatre etiquette. The live animal has often been used for providing living simulations.<sup>25,27,28</sup> Bench models, which are becoming popular for teaching specific surgical skills,29-33 have the advantages of low cost, portability, ability to use in an unsupervised practice, and they provide unlimited practice for residents. The feasibility of residency bench and wet laboratory training in essential technical skills in a human cadaver model has been demonstrated.24-25 Descôteaux and Leclère<sup>34</sup> have summarized the theories and principles of motor skill learning as they apply to surgical training. Thomas et al<sup>35</sup> concluded that synthetic tissues can provide a useful and functionally reproducible means

for learning basic surgical skills. It must be emphasized that the introduction of laparoscopic techniques made the teaching of operative skills more difficult, due to many factors, including the complexity of the procedure, the time required in teaching, and medicolegal concerns. Nonetheless, Rossers have shown that concentrated didactic training in laparoscopy in a brief course unrelated to prior surgical experience can improve skills in both residents and established surgeons.<sup>36</sup>

Advances in computing, imaging and information transfer have allowed the use of virtual reality in the performance and teaching of surgery.37 For example, the minimally invasive surgery-trainer virtual reality (MIST-VR) system allows tasks to be performed using laparoscopic instruments connected to a computer, where the movement of the instruments can be both measured and translated into a graphical display.<sup>38</sup> Anaesthesiologists have pioneered the use of operating room simulators to improve crises management skills.39 Such methods will help overcome problems of decreasing number of clinical cases in medical teaching centers and the increasing importance of minimal access surgery. In this way, we will have in our hands practical and convenient methods that can be applied in our surgical training programme to overcome similar problems.

The traditional educational strategies in the current surgical training programme need to be changed to cope with recent developments in minimally invasive surgery, and the decreasing number of clinical cases in medical education centers. The need for change should first be confirmed by surveying surgical consultants involved in the training and education of surgical residents, and obtaining their feedback.

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### References

1. Lowrence W. General surgery in evolution: Technology and competence. The Am J Surg. 1996; 171:2-9.

 Mazlish B. The fourth discontinuity. The coevaluation of humans and machines. New Haven, Conn; Yale University Press; 1993.

3. Flexner A. Medical Education in the United States and Canada. New York: Carnegie Foundation for the advancement of teaching; 1910.

4. Hamdorf JM, Hall JC. Acquiring surgical skills. Br J Surg. 2000;87:28-37.

 McColl I. The Guy's surgical training programme: A report of the first 5 years. Br J Surg. 1977; 64: 745-746.
Cushieri A. Whither minimal access surgery: tribulations and expectations. Am J Surg. 1995; 269: 9-19.

7. Steele RJC, Logie JRC, Munro A. Technical training in surgery : The trainees view. Br J Surg. 1989;76: 1291-1293.

8. MacIntyne IMC, Munro A. Simulation in surgical training: Trainee surgeons need to acquire skills outside the operating theater. **BMJ**. 1990;30:1089-1099.

9. Andreopoulos S. The folly of teaching-hospital merges. N Eng J Med. 1997; 336: 61-64.

10. Wheeler HB. Myth and reality in general surgery. Bull Am Coll Surg. 1993; 78:21

11. Weigelt J, Brasel K, Olson C, Thal E. Opinions of practicing general surgeons on surgical education. Am J Surg. 1998;176:481-85.

 Barnes RW. Surgical handicraft: teaching and learning surgical skill. Am J Surg. 1987;153: 422-427.
Pories WJ, Aslakson HM. The surgical residency: The job description does not fit the job. Arch Surg.

1990;125: 147-149. 14. Barnes RW. The next generation of surgical residents: What are the challenges and the opportunities? Arch Surg. 1990;125: 433-436.

 Folse JR. Presidential address: Surgical educationaddressing the challenges of change. Surgery. 1996; 120: 575-579. **16.** Ritchie WP. Graduate surgical education in the era of managed care: A statement from the American Board of Surgery. J Am Coll Surg. 1997;184:311-312.

 Fox PD, Wasserman J. Academic medical centers and managed care: Uneasy partners. Health Affairs. 1993:12:85-93.

18. Flint L, Flint CB. Academic surgical group practices at the dawn of health reform. Ann Surg. 1994;220: 374-381.

19. Pories WJ, Smout JC, Morris A, Lewkow VE. U.S. Health care reform: will it change postgraduate surgical education? **World J Surg.** 1994;18:745-752.

20. Elliot DW. Presidential address: Outsiders in surgical education—are the voluntary faculty worth more than they are paid? **Surgery.** 1988;104: 585-591.

21. Ward HB, MacCanley MK, Foker JE. The ivory tower from outside and in: A survey of Minnesota surgeons. **Surgery**. 1993;114: 436-441.

22. Porter N. Webster's revised unabridged dictionary. Springfield, MA: G and Merriam Co;1913. 23. Merriam-Webster's Collegiate Dictionary. 10th ed. Springfield, MA: Merriam Websters, Inc; 1998.

 Anastakis J, Regehr G, Resznick RK, Cusimano M, Murnaghan J, Brown M, Hutchison C. Assessment of technical skills transfer from the bench training model to the human model. Am J Surg. 1999;177:167-170.
Lossing AG, Hatswell EM, Gilas T et al. A technicalskills course for 1st-year residents in general surgery. A

descriptive study. Can J Surg. 1992; 35: 536-540. 26. Heppell J, Beaucamp G, Chollet A. 10-year experience with a basic technical skills and perioperative management workshop for first-year residents. Can J Surg. 1995;38:27-32.

27. Sain J, Chang BB, Paty PSK, et al. An animal model for instructing and the study of in situ bypass. J Vasc Surg. 1990;12: 538-540.

**28.** Christopherson WA, Buchsbaum HJ, Voet R, Lifshitz S. The canine laboratory in the training of Oncology fellow. **Gynecol Oncol.** 1986;23;26-34.

29. Stotter AT, Becket AJ, Hansen JPR, et al. Simulation in surgical training using freeze-dried material. Br J Surg. 1986;73: 53-54.

30. Barnes RW, Lang NP, Whiteside MF. Halstaedian technique revisited. Innovations in teaching surgical skills. Ann Surg. 1989;210:118-121.

**31.** Hill J, Kiff ES. An abdominal wall jig for surgical craft workshops. **Ann Roy Coll Surg Engl.** 1990;72: 386-387.

32. Sammaro MJ, Youngblood JP. A resident teaching programme in operative surgery. Obstet Gynaecol 1993; 81: 463-466.

33. Steel RJC, Walder C, Herbert M. Psychomotor testing and the ability to perform an anastomosis in junior surgical trainees. Br J Surg 1992; 79: 1065-1067.

34. Descôteaux J, Leclère H. Learning surgical technical skills. Can J Surg 1995; 38: 33-38.

35. Thomas WEG, Lee PWR, Sunderland GT, Day RP. A preliminary evaluation of an innovative synthetic soft tissue module (skill tray) for use in basic surgical skills workshops. Ann R Coll Surg Engl 1996; 78 (Suppl 6): 268-71.

36. Rosser JC, Rosser LE, Saving RS. Objective evaluation of a laparoscopic surgical skills programme for residents and senior surgeons. Arch Surg 1998; 133: 657-61.

37. Dunnington GL, DaRosa DA. Changing surgical education strategies in an environment of changing health care delivery systems. World J Surg 1994; 18: 734-7.

38. Stone RJ, McCloy RF. Virtual environment training systems for laparoscopic surgery: activities at the UK's Wolfson Centre for minimally invasive therapy. Journal of Medical Virtual Reality 1996; 1: 42-51.

39. Goba DM, Howard SK, Flanagan B, et al. Assessment of clinical performance during simulated crises using both technical and behavioral ratings. Anaesthesiology 1998; 89: 8-18.