

## An End to “See One, Do One and Teach One” Residency Training Programme – Impact of the Training, Education, Surgical Accreditation and Assessment (TESA) Programme on Medical Care and Patients’ Safety<sup>†</sup>

Thiam-Chye Tan,<sup>1,2</sup> MBBS, MMed (O&G), Kim-Teng Tan,<sup>1</sup> MMed (O&G), MRANZCOG, FAMS, John CS Tee,<sup>2,3</sup> MBBS, MMED (O&G), FAMS

### Abstract

**Introduction:** The delivery of optimal and safe medical care is critical in healthcare. The traditional practice of “*See one, do one and teach one*” residency training programme is no longer acceptable. **Materials and Methods:** In the past, there was no structured residency training programme in our hospital. There were several cases of organ injuries from surgeries performed by the residents. In 2005, we conducted a pilot study to organise a structured teaching, education, surgical accreditation and assessment (TESA) residency programme for 15 residents in the Division of Obstetrics and Gynaecology, KK Women’s and Children’s Hospital. We performed a written questionnaire survey of the residents on the new programme and patients’ expectation (n = 2926) as subjective outcomes in the 1-year follow-up. We also studied the complication rates of all minor and major surgeries performed by the residents in 2004 and 2005 as an objective outcome. **Results:** All the residents (n = 15) surveyed supported the TESA programme. Patients’ expectation improved significantly from 71% in 2004 (n = 1559) to 83% in 2005 (n = 1367) (P = 0.03). There were 10,755 surgeries in 2004 and 10,558 surgeries in 2005 performed by our residents, with 6 cases (5.6%) of organ injuries in 2004 compared to 3 cases (2.8%) in 2005. This reduction was not statistically significant. **Conclusion:** The TESA residency programme in our hospital has an impact on the delivery of optimal and safe medical care while ensuring the training of residents to be competent specialists.

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**Key words:** Complication rate, Residents, Safe medical care, Surgery

### Introduction

The delivery of good medical care and the safety of patients are of utmost importance in all healthcare systems. Indeed, healthcare providers need to rely on one another’s skills to minimise risk and decrease the number of medical errors.<sup>1</sup> This is of particular concern in the practice of obstetrics and gynaecology where medico-legal litigations are common. From 1975 to 2000, medical malpractice costs for obstetrician-gynaecologists have risen to nearly 4-fold, higher than other medical costs.<sup>2</sup> In addition, it has been estimated that defensive medicine may cost society \$80 billion per year.<sup>2</sup> This risk and cost of adverse outcomes due to medical errors may be unnecessarily high.<sup>3</sup> The liability insurance crisis has also contributed to increased efforts to improve the quality of healthcare for women.<sup>4</sup>

The traditional teaching of “*See one, do one and teach one*” residency training programme is no longer an acceptable and safe practice today. It is critical that every doctor who is performing any surgical procedure on the patient, must be rigorously trained, supervised and assessed to be competent before operating independently on the patient. A residency training programme has to answer one fundamental question: “*How can we make medicine safer?*”<sup>4</sup>

### Objective

The Division of Obstetrics and Gynaecology in KK Women’s and Children’s Hospital undertook this project to revamp our hospital residency programme in order to ensure that our residents receive formal and structured

<sup>1</sup> Department of General Obstetrics and Gynaecology, KK Women’s and Children’s Hospital, Singapore

<sup>2</sup> Duke-NUS Graduate Medical School, Singapore

<sup>3</sup> Division of Obstetrics and Gynaecology, KK Women’s and Children’s Hospital, Singapore

Address for Correspondence: Dr Tan Thiam-Chye, Department of General Obstetrics and Gynaecology, KK Women’s and Children’s Hospital, 100, Bukit Timah Road, Singapore 229899.

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teaching, education, surgical accreditation and assessment without compromising the safety and care of patients.

### Materials and Methods

In the past, there was no structured residency training programme in our hospital to ensure proper teaching, education, accreditation and assessment of our residents. There were several cases of organ injuries from surgery performed by the residents, which required additional hospital stay, blood transfusions, febrile morbidity and thus, an increase in healthcare costs. In 2004, we had 2 cases of severe bleeding after Caesarean sections performed by our residents, which required hysterectomy.

We conducted a pilot project to organise a structured teaching, education, surgical accreditation and assessment (TESA) residency programme in 2005. The training and education programmes comprise of weekly structured continuing education programme and formal surgical training workshops in both obstetrics and gynaecology. These workshops include a basic surgical and episiotomy workshop on simulated models, a basic laparoscopy and hysteroscopy workshop, an advanced laparoscopy and suturing workshop, a basic colposcopy workshop, a workshop on labour ward emergencies including forceps and vacuum-assisted delivery on simulated models, handbooks with guidelines on the management of common conditions and interpretation of investigations, mentor-mentee scheme to impart surgical experience, structured surgical accreditation and assessment for all minor and major surgeries performed by the residents and 3-monthly theoretical assessments on their knowledge of Obstetrics and Gynaecology (Appendix 1).

It is mandatory that each resident performs the stipulated number of cases for each surgical procedure under supervision by the senior doctors before he/she qualifies for the assessment tests. Each individual resident will then be assessed for his/her surgical skills and deemed qualified for each procedure by the senior doctors and consultants in the Division before they are allowed to perform the procedure independently. Two independent assessors are required for the accreditation of each procedure. The assessment is based on global rating of the surgical technique and safety considerations of the resident who is performing the procedure.

We performed a written questionnaire survey of our residents on the new programme. Fifteen residents who were in their first, second and third years of residency training, participated in the survey. Their identities were anonymous in the survey to ensure confidentiality. They were asked specifically if they supported the new system of TESA when compared to the previous teaching programme.

We also used a written questionnaire to obtain feedback

from a random sample of the patients who attended the resident clinics from 2004 to 2006 as a subjective outcome indicator. They were asked if the standard of medical care provided by the resident doctors met their expectations. The follow-up period was 1 year after the implementation of the TESA programme. One thousand, five hundred and fifty-nine patients were surveyed from April 2004 to March 2005 and 1367 patients were surveyed from April 2005 to March 2006.

We also studied the complication rates of all minor and major surgery performed by the residents in 2004 (before the implementation of the TESA programme) and 2005 (after the implementation of the TESA programme) as an objective outcome indicator. Data were obtained from the Medical Affairs Unit (MAU) of our hospital, which keeps the records of all intraoperative complications from surgery. It is mandatory in our hospital to report all intraoperative complications of organ injuries to the MAU.

There was no control group in this study as it is mandatory that all the residents undergo the TESA programme in the hospital since 2005.

### Results

For subjective assessment, 100% of residents ( $n = 15$ ) surveyed were supportive of the new TESA programme. There was also a significant improvement in patients' expectations from 71% in 2004-2005 to 83% in 2005-2006 ( $P = 0.03$ ).

There were 10,755 surgeries in 2004 and 10,558 surgeries in 2005 performed by our residents. There were 6 cases (5.6%) of organ injuries in 2004 compared to 3 cases (2.8%) in 2005. Thus, there was a reduction of surgical complications performed by the residents in both minor surgery and major surgery ( $P = ns$ ) (Table 1). This reduction was not statistically significant.

In terms of Caesarean sections performed by the residents, 2 out of 1483 cases performed in 2004 had severe bleeding which resulted in hysterectomy. One thousand, four hundred and forty-seven cases were performed by the residents in 2005 with no cases of caesarean hysterectomy ( $P = ns$ ). This difference was not statistically significant.

### Discussion

We must create a culture in medicine in which patient safety is our core principle. Other high-risk industries, such as aviation, have transformed themselves by investing in systems that recognise the critical importance of "safety first," and hence have achieved remarkable safety records.<sup>4</sup> We must come to a common understanding that error reduction is crucial in our practices and training programmes.<sup>4</sup> With this objective in mind, the revamp of our residency training programme marks a critical milestone

Table 1: Gynaecological Surgeries and Caesarean Sections Performed by Residents in 2004 and 2005

Year	Gynaecological surgeries		Caesarean sections	
	No. of surgeries with complications (%)	Total no. performed	No. of hysterectomies	Total no. performed
2004	6 (5.57%)	10,755	2	1483
2005	3 (2.84%)	10,558	0	1447

for patients' safety while at the same time ensuring that our residents obtain adequate training to be qualified and competent specialists.

The TESA programme reiterates the importance of continuing medical education, especially in the postgraduate training programme. Medical education is a lifelong process.<sup>5</sup> Medical school is a springboard into a lifetime of learning and not an end to medical education.

The Joint Commission has also stressed the importance of team training in labour and delivery units to improve communication and reduce the likelihood of adverse events.<sup>6</sup> Team training or crew resource management was adopted by the airline industry in the 1980s and later was required by the Federal Aviation Administration.<sup>3</sup> The Institute of Medicine also recommended team training in 2003, stating that "*all health professionals should be educated to deliver medical care as an interdisciplinary team, emphasizing evidence-based practice, quality improvement approaches, and informatics.*"<sup>7</sup> Similarly, in the TESA programme, communication and team training were emphasised in several training workshops such as the labour ward emergency workshop, when drills were performed as a team for shoulder dystocia, resuscitation, severe postpartum haemorrhage and eclamptic fit.

Simulation training is increasingly being used in medical education and training.<sup>8</sup> It is ideal and meets Kaufman's principles of medical training.<sup>9</sup> The unique feature of simulated training in allowing opportunities for the learners to reflect on their practice and assess their performance makes it ideal for the training of specialised skills. The use of simulators allows for experiential learning, including constructive feedback, repeated learning experience and reinforcement.<sup>8</sup>

Many TESA training workshops included the use of simulated models. These models were used for the workshops on shoulder dystocia training, assisted instrumental delivery training with forceps and vacuum cups, laparoscopy surgical training and suturing with simulated and animal models as well as insertion of the Mirena intra-uterine system with simulated pelvic models. The inclusion of simulated models in the TESA programme allowed for specialised training of our residents without

compromising on patient care. These training sessions would come in handy when they performed the specialised procedures in actual clinical settings and on patients. Simulators fill the gap of medical training by allowing for the repeated practice of managing uncommon medical problems such as shoulder dystocia and postpartum haemorrhage that require timely expert intervention for a successful outcome.<sup>8</sup>

The TESA programme was well received and supported by the residents. It significantly improved the quality of medical care through structured continuing medical education and training. There was a 50% reduction rate in the organ injury rates from 1 in 1792 cases in 2004 to 1 in 3521 cases in 2005. Although this result was not statistically significant, the TESA programme has improved patients' safety and it ensured that every resident had undergone rigorous training and accreditation for all surgical procedures in our hospital before they were allowed to perform independently. This reduction is clinically relevant as fewer patients suffer complications based on the inexperience of the residents. However, we note that despite this initial encouraging result, it seems too short a period to attribute these improvements to this intervention alone. We will continue to collect the data of the patients' survey and residents' surgical complication rates in subsequent years. We recognise that the absence of a control group of residents is also another limitation of this study. We compared the results of 2 years which could have other confounding factors such as the varying clinical competence and professionalism of the different batches of residents.

Stovall et al<sup>10</sup> conducted a survey in 2006 to assess laparoscopic training curriculum in the US Obstetrics and Gynaecology residency programmes. They showed that most residency programmes (69%) have implemented a formal laparoscopy training curriculum. Seventy-two per cent of those surveyed thought that in the future the healthcare industry would demand proof of competency in laparoscopy as a standard of care.<sup>10</sup> Indeed we will be introducing this formal training and accreditation of Minimally Invasive Gynaecology Surgery in our hospital. Lastly, we recommend that this rigorous programme be implemented in all other surgical disciplines as well.

## Conclusion

The establishment of the TESA residency programme in our hospital has an impact on the delivery of optimal and safe medical care to the patients and, at the same time, allows for the training of our residents to be competent specialists. We will be introducing this in the accreditation of Minimally Invasive Gynaecology Surgery in our hospital and recommend that the programme be implemented in all other surgical disciplines as well.

**Appendix 1. Components of the TESA Programme****Weekly structured continuing education programme:**

1. Just-one-hour (JOH) weekly training sessions on management of clinical problems, journal club reviews and latest evidence-based medicine
2. Patient Management Forum (2-weekly) on management of clinical problems and reviews of patient feedbacks on suboptimal medical care
3. Weekly National Training Programme (NTP) organised by the Specialist Training Committee for all the residents on topics in Obstetrics and Gynaecology

**Surgical training workshops:**

1. Basic surgical and episiotomy workshop on simulated models
2. Basic laparoscopy and hysteroscopy workshop
3. Advanced laparoscopy and suturing workshop
4. Basic colposcopy workshop
5. Safe surgery for gynaecologists workshop
6. Workshop on labour ward emergencies including forceps and vacuum-assisted delivery on simulated models
7. Cardiotocography workshop

**Handbooks and guidelines published:**

1. Handbook for Common Obstetrics and Gynaecology Conditions (2005), 1<sup>st</sup> edition. Singapore: KK Women's Hospital
2. Handbook on Common Investigations in Obstetrics and Gynaecology (2005), 1<sup>st</sup> edition. Singapore: KK Women's Hospital.
3. Handbook on Obstetrics and Gynaecology for Nurses and Clinical Assistants (2006), 1<sup>st</sup> edition. Singapore. KK Women's Hospital.
4. A Comprehensive Guide for Safe Prescription of Medications in Obstetrics and Gynaecology (2006), 1<sup>st</sup> edition. Singapore. KK Women's Hospital.
5. Practical O&G Handbook for the General Practitioner (2006), 1<sup>st</sup> edition. Singapore: World Scientific Publisher. Authors: TC Tan, KT Tan and EH Tay.

**Assessments:**

1. 3-monthly theoretical assessments
2. Cardiotocography assessment

3. Logbook for accreditation of all minor and major surgery
4. Surgical assessment of all minor and major surgery by senior doctors after completion of accreditation requirements
5. Mentor-mentee surgical training programme
6. Daily roster of consultants for training of residents in forceps and vacuum-assisted delivery

**REFERENCES**

1. Shumway JM. Components of quality: competence, leadership, teamwork, continuing learning and service. *Med Teach* 2004;26:397-9.
2. Pearlman MD. Patient safety in obstetrics and gynecology: an agenda for the future. *Obstet Gynecol* 2006;108:1266-71.
3. Gordon JA, Wilkerson WM, Shaffer DW, Armstrong EG. "Practicing" medicine without risk: students' and educators' responses to high-fidelity patient simulation. *Acad Med* 2001;76:469-72.
4. Pearlman MD, Gluck PA. Medical liability and patient safety: setting the proper course. *Obstet Gynecol* 2005;105:941-3.
5. Khoo HE, Amin Z, Chong YS. Curriculum TIPS for all of us. *Ann Acad Med Singapore* 2006;35:597-8.
6. Joint Commission on Accreditation of Healthcare Organizations. Preventing infant death and injury during delivery. *Sentinel Event Alert* July 2004.
7. Institute of Medicine (US). Health professions education: a bridge to quality. Washington, DC: National Academy Press, 2003.
8. Ti LK, Tan GM, Khoo SG, Chen FG. The impact of experiential learning on NUS medical students: our experience with task trainers and human-patient simulation. *Ann Acad Med Singapore* 2006;35:619-23.
9. Kaufman DM. Applying educational theory in practice. *BMJ* 2003;326:213-6.
10. Stovall DW, Fernandez AS, Cohen SA. Laparoscopy training in United States obstetric and gynecology residency programs. *JSL* 2006;10:11-5.