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RESEARCH

Creating the perfect intern anaesthesia rotation: a survey using feedback from past interns

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Background: Community service doctors (CSDs) are often expected to administer anaesthesia after minimal training and with very little support, especially in rural hospitals. This leads to unnecessary stress on these junior doctors and may lead to poor anaesthesia outcomes.
Objectives: The aim of this study was to understand the experiences of CSDs administering anaesthesia. This feedback will be used to improve the current intern training programme for anaesthesia and to structure the rotation according to their needs.
Methods: A questionnaire was sent to Pietermaritzburg (PMB) interns who completed their anaesthesia intern rotation between 2008 and 2010. Two data sets were collected: quantitative data (this will be reported on in another paper) and qualitative data. The qualitative data included five open-ended questions about the intern rotation in anaesthesia.
Results: Between 2008 and 2010, 298 interns completed an anaesthetic rotation. The survey was sent to 259 doctors of whom 189 responded (73%). The first three questions were about the structure of the intern rotation in anaesthesia. The responses were analysed together. The following feedback was common: more autonomy, longer duration of the anaesthesia rotation and more practical exposure during the rotation. Questions 4 and 5 were about the impact of internship and community service on future career choice. Community service had a greater impact on career choice than internship.
Conclusion: Intern training in anaesthesia is essential to create confident CSDs. Feedback from previous interns should be used to improve intern training programmes.

Keywords: anaesthesia education, intern training, obstetric anaesthesia training, rural health care

Introduction

There has been a call by the Lancet Commission of Global Surgery[1] and the Global Surgery Movement of South Africa[2] to emphasise the need for universal access to safe surgery and anaesthesia. Safe surgery remains a low priority in many countries and roughly 5 billion people worldwide do not have access to safe surgery. Safe surgery cannot be achieved without appropriate training in surgery and anaesthesia.

Medical education in South Africa needs to be focused on addressing the priority medical needs of its community. This has been termed socially accountable medicine by the World Health Organization (WHO).[3] Increasing the internship period from one to two years and the institution of community service in South Africa have been useful changes towards this goal. However, there has been little feedback as to whether these interventions have improved health care for the vulnerable citizens of South Africa.[4] We need to examine whether our undergraduate medical training together with the two-year internship adequately prepare community service doctors (CSD) to provide health care in a socially accountable way.

Community service doctors often work unsupervised and with little support in rural hospitals.[5] They may be expected to administer anaesthesia after very little training.[6] In fact, for most of the doctors working in rural hospitals, their two-month anaesthesia rotation as interns was the only training they received in anaesthesia. Nkabinde *et al*. showed that CSDs felt inadequately prepared in basic anaesthetic skills as well as in the management of emergencies.[7] Poor training and unsupervised working conditions lead to unnecessary stress on the doctors in rural areas and could contribute to poor anaesthetic outcomes in rural hospitals.[8] Even though prolonging the anaesthesia rotation to two months in 2007 has improved immediate outcomes in the performance of interns,[9,10] no follow-up has been done amongst these young doctors to assess the effects on their community service experience in anaesthesia.

The anaesthesia intern rotation in Pietermaritzburg is structured to ensure exposure to a wide variety of cases. Interns spend time at a district, regional and tertiary hospital, with dedicated supervisors at each site. They also spend two weeks in ICU where they learn to manage critically ill patients and two weeks in obstetric theatre. The interns further also participate in night calls, to ensure exposure to emergency work. They attend and present at tutorials, receive training as per the Essential Steps in the Management of Obstetric Emergencies (ESMOE) module and attend departmental academic and Morbidity and Mortality meetings.

The purpose of this questionnaire-based study was to gain an understanding of the experience of community service doctors. The feedback of previous Pietermaritzburg interns would enable the authors to better understand the importance of the anaesthesia rotation and to structure the rotation according to their needs.

Methods

Biomedical Research Ethics Committee approval and permission from the Pietermaritzburg hospital complex was obtained prior to the study. All previous Pietermaritzburg interns who completed their anaesthesia intern rotation between 2008 and 2010 were sent a questionnaire to assess their anaesthesia experiences during their community service.

REDCap software was used to design a database and an online questionnaire.[11] The REDCap software was made available to the study group by ANSA (Anaesthesia Network for South Africa, a project of the South African Society of Anaesthesiologists). The database was password protected and the results anonymised. The online questionnaire was sent to previous interns of the Department of Anaesthesia, Pietermaritzburg complex. REDCap software only allows one return per email address, and this was used to avoid duplicate entries. All the doctors who had completed their anaesthesia rotation in Pietermaritzburg from 2008 to 2010 were included in the study. There were no exclusion criteria.

Telephonic and hard copy questionnaires were offered to participants as alternatives to the online version.

Two data sets were collected:

- Quantitative data: This included demographic data, details regarding their intern training and general details regarding their community service. These data will be reported in another paper.
- Qualitative data: The following open-ended questions were asked of the doctors:

1. Are there any aspects of your intern training that you would change now with hindsight?
2. Are there any aspects of the intern rotation in anaesthesia that you would change to better prepare someone for community service?
3. Do you have any other feedback regarding your anaesthesia rotation as an intern?
4. Did your internship training in anaesthesia influence your career choice? And how?
5. Did your community service experience influence your choice of career? And how?

The data were extracted from the REDCap database and the five open-ended questions were analysed independently by the authors. Each of the authors independently classified the responses according to themes after which they compared their classifications. The three authors converged upon a final classification, which was not substantially different from the three independent ones. Where there was a dispute on classification, the authors discussed the items and reached a consensus.

Results

Between 2008 and 2010, 298 interns completed their anaesthesia rotation in the Pietermaritzburg complex. The survey was sent to 259 doctors. Three previous interns had subsequently died, and 39 were not contacted as recent contact details were unavailable. A total of 189 responses were received (73%).

Roughly half (51.3%) of the doctors surveyed provided anaesthesia during community service. Of these, 68% worked in rural hospitals.

The responses to the first three questions were as follows: of the 189 questionnaires, responses to questions 1, 2 and 3 were received from 167, 164 and 154 doctors respectively. Of these 102, 93 and 56 respectively answered that they would not change the rotation. The remaining answers (65, 71 and 98 respectively) gave feedback about the rotation. The majority of doctors responded that they would not change the anaesthesia rotation. The remaining suggestions for change were analysed to determine possible, feasible ways to improve intern training.

Question 1: Are there any aspects of your intern training that you would change now with hindsight? There were 65 responses to the question; of these, 22 participants replied with comments that were about intern training in general. A further 49 participants replied specifically about the anaesthesia rotation. This question was aimed at intern training in general, but retrospectively the phrasing of the question was too broad. Accordingly, the 49 anaesthesia-specific answers were analysed together with the responses from the next question. The 22 comments about intern training in general were varied. They included: seven comments about changing the duration and structure of various rotations, three negative comments about internship in Pietermaritzburg, three comments asking for more formal teaching and three other comments.

Question 2: Are there any aspects of the intern rotation in anaesthesia that you would change to better prepare someone for community service? Seventy-one doctors gave feedback about the intern rotation. The most common themes in the answers were around autonomy, the structure and the focus of the rotation; these will be analysed together.

Question 3: Do you have any other feedback regarding your anaesthesia rotation as an intern? Of the 98 responses, 60 had positive feedback about the intern rotation and four had negative feedback. The 34 remaining responses will be analysed together with the answers to the first two questions.

There was a total of 154 comments concerning the anaesthesia rotation from question 1 to 3. As the responses all related to feedback about the rotation, they were pooled and analysed together. The following themes were common (Figure 1):

(1) Autonomy/ less supervision/ more hands on (25.3%)

(2) Longer duration (18%)

(3) More practical experience/more general anaesthesia/ more intubations (15.6%).

(4) Structure of the rotation: 13 (8%) made suggestions to improve aspects of training

(5) Various other comments:

a. Focus on rural anaesthesia (6.4%);

b. Case mix (5%);

c. Sedation and regional anaesthesia (4.5%);

d. Negative comments (3.9%);

e. Confining anaesthesia to the second year of internship (3.2%);

f. Method of assessments and teaching material (5.2%);

g. Unclassifiable comments that were not themed made up the rest of the responses (7.8%).

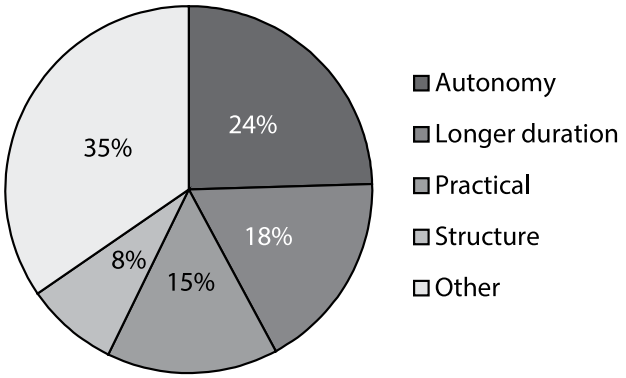

Figure 1. Feedback concerning the rotation.

Question 4: Did your internship training in anaesthesia influence your career choice? And how? And *Question 5: Did your community service experience influence your choice of career? And how?* Eighty doctors (42%) replied that their internship influenced their career choice, and 122 (65%) felt that their community service experience had influenced their career choice.

Discussion

The South African Society of Anaesthetists (SASA) recommends that CSDs should not perform anaesthesia without supervision.[12] However, in reality this happens frequently. One previous intern commented that 'a community service doctor by definition will not have enough experience to be able to deliver safe anaesthesia on their own'. This fact has been overlooked many times in rural hospitals and community service doctors are expected to administer anaesthesia, even if they do not feel confident to do so. And often, even if they are supervised, supervision is provided by poorly qualified and deskilled senior doctors.

Our interns gave us some feedback regarding the stress of being a community service doctor in rural hospitals, although we did not specifically ask about this. Comments made included: 'We were supervised by much older anaesthetists, whose practice I did not feel was safe' and 'Some rural areas practice horrific anaesthesia with very high anaesthesia related deaths'. They also felt isolated and did not know where to go for help: 'as a CSD you will not always have someone to ask'. This is concerning, as it highlights the fact that CSDs are often left without supervision, without help available if an emergency arises. 'I found community service very stressful, particularly anaesthesia as we had minimal support.' This highlights the need for stricter guidelines by the HPCSA for the anaesthesia provision by CSDs.

Some CSDs also expressed the negative effect on their career choice of being poorly supported during community service. One doctor replied: 'I wanted to get away from an unsupported, exposed, mostly unsupervised, isolated environment' and another: 'My community service experience pushed me to the point where I wanted to give up a career in the medical field.'

The role of CSDs, especially when it comes to anaesthesia, needs to be clarified. Some interns expressed a lack of confidence: 'I would not have been comfortable doping alone after internship.' Nkabinde *et al*. also commented that community service doctors felt ill prepared to manage anaesthetic emergencies.[7] Should the intern training be specifically aimed at preparing community service doctors for anaesthesia in rural hospitals?

This discussion will use feedback from previous interns to highlight the importance of the anaesthesia rotation during internship, and use their feedback to establish an optimum anaesthesia rotation for interns.

The importance of a well-run anaesthesia intern rotation

Anaesthesia training is an essential part of internship. The respondents highlighted the following five benefits of a well-run anaesthesia rotation:

Anaesthesia training prepares community service doctors to administer anaesthesia in rural hospitals

Adequate intern training in anaesthesia can enable CSDs to provide anaesthesia in rural hospitals. One doctor replied that he/she was the only CSD at the hospital who felt confident enough to do anaesthesia. Another CSD said: 'If not for the training I received, I would not have been able to be deputy HOD in anaesthesia in my community service! I even structured a training programme for our interns.'

Anaesthesia training enables doctors with skills they can use in other disciplines

The skills learned in anaesthesia can be used in many other disciplines. During their anaesthesia rotation, some time is spent in the ICU, where interns are taught to recognise and manage critically ill patients.

> 'The two weeks in ICU was invaluable during my medicine rotation where I cared for ICU patients. I would not have coped without it! The skills I learned including intubation and placement of central lines were invaluable in casualty, ICU and the wards'.

Interns also learn valuable airway management and resuscitation skills, as well as pain management of patients. These can be useful in the emergency room; as one doctor replied: 'It improved my knowledge and approach in managing emergency cases, especially in the casualty setting.'

Internship can also inspire doctors to continue a career in anaesthesia

Undergraduate exposure to anaesthesia is limited, and good teaching in anaesthesia during internship can create enthusiastic doctors, keen to continue in anaesthesia. 'I was convinced by the professional conduct, dedication and passion of the consultants and registrars at PMB that this is a meaningful, pleasant, stimulating field to go into.'

It can also encourage junior doctors to do the Diploma in Anaesthesia (DA). Medical officers with a DA play an important role in the provision of anaesthesia in South Africa as there is a serious shortage of anaesthetists in the country.[13] One previous intern replied that 'outstanding teaching and witnessing novel anaesthetic techniques sparked a desire to complete my DA'.

Doctors also used the skills and knowledge learned during internship to help them pass the DA. 'I did the DA in September of my community service with the knowledge and skills from internship.'

A good intern anaesthesia rotation can aid in the catch-up of deficiencies from medical school training

'Let's face it, you actually have no clue regarding providing anaesthetics when you come out of med school.' Undergraduate anaesthesia training is highly variable; one respondent replied that 'some institutions don't provide adequate teaching during

medical school'. This is something that needs to be fed back to medical schools, as uniformity in undergraduate training in anaesthesia would aid in establishing a curriculum for anaesthesia intern training, as all interns would have similar backgrounds and knowledge as a baseline.

Confidence of medical doctors

A well-structured rotation can improve all-round confidence of medical doctors. 'It really helped build my confidence as a medical doctor going forward.'

Feedback to improve the rotation

> 'Fact is, sooner or later, whether you like it or not, you will have no choice but to give anaesthesia for at least an emergency caesarean section – definitely in the middle of the night in some dodgy hospital with no one else to help you and the porter acting as the anaesthetic nurse…. So be as well prepared as possible!'

The survey yielded valuable feedback from previous interns. This can be used to optimise the intern anaesthesia rotation. The most common themes will be discussed further.

Watching closely at a distance – a cry for more autonomy

Supervision and autonomy are equally important in training junior doctors. Supervision of interns is essential in enabling professional development and to ensure patient safety. It provides guidance and feedback to interns and enables them to provide good quality health care to patients. Autonomy is the ability to act and make decisions without being controlled by anyone else.[14] Autonomy with structure and support is important in medical education as it can lead to greater work satisfaction and confidence.[15] Autonomy should be graded to enable junior doctors to take increasingly more ownership of patient management.[16] As seen in Figure 2, the interns should start with maximum supervision and very little autonomy. The supervision should then slowly be decreased to allow an increase in autonomy and decision-making by interns. The balance between supervision and autonomy should be guided by the individual intern's performance. Increased supervision often leads to a perception of decreased autonomy.

This was the most common response to the first three questions in this survey. Previous interns felt over-supervised and did not have enough autonomy to start working independently. They felt superfluous, not needed. This can lead them not to take the initiative and to underperform. One respondent replied that: 'It sometimes felt that we were never required'.

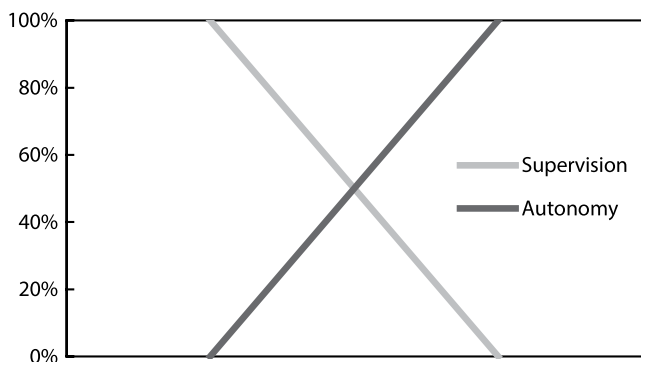

Figure 2. Supervision vs. autonomy.

Further comments from interns included a need to 'do more, be more hands on, take the lead and run the show, supervision from a distance/just a shout away'. These all emphasise a need for more autonomy and less supervision to enable their learning. One previous intern replied: 'I enjoyed anaesthesia more as a community serve doctor when I was forced to make decisions and learn things by doing them myself'; this comment again emphasises the importance of standing back as a supervisor and allowing the intern to experience performing the case by him/herself.

Suggestions made by our previous interns were for their teachers to stand back more and allow them to plan for and do the entire case and only step in when required. They felt that this would have helped build confidence for community service when they would be expected to work alone. 'It's a very different experience doing a GA alone, there is never a true appreciation of the nerves and stress of giving that anaesthetic yourself.'

Other suggestions included the need to create an intern list which would consist of simple cases, which interns could run during their second month of training and allowing interns to anaesthetise simple cases alone, with distanced supervision.

More practical experience – transforming theory into practice

Medical training has a long history of 'learning on the job' or apprenticeship-style learning.[17] Learning through experience is an ancient concept. Aristotle wrote around 350 BC 'for the things we have to learn before we can do them, we learn by doing them'. In keeping with traditional teaching of medicine, our interns should learn anaesthetic skills through hands-on experience.

This need for more practical experience was a common theme in the feedback. It overlaps with their need for more autonomy. Practical experience builds the confidence of junior doctors. 'Personally I learned a lot of theory but I lacked the practical aspects of anaesthesia, which sadly was what I needed going forward.' Learning a complex task like the administration of anaesthesia requires interns to be hands on and to learn by doing tasks. One respondent replied that 'interns need to do everything themselves, so that by the end of their rotation they are confident to do the case from the beginning to the end.'

Practical experience in anaesthesia allows junior doctors to get comfortable with certain procedures, as a previous intern so perfectly summarised: 'I had no muscle memory for these sort of tasks (i.e. setting ventilators, using the machine to BMV, giving drugs appropriately, titrating gasses) because I watched from a polite distance.'

CSDs also felt that they would have benefited from more hands-on exposure to general anaesthesia. 'It helps a lot in a rural hospital if you know how to do a GA.' They also felt it would be valuable to do more intubations and needed more exposure to safe sedation skills and regional anaesthesia.

Structure of the intern anaesthesia rotation

Longer rotation: CSDs felt that 'two months is just not enough to feel competent' and that

> 'two months is not long enough to prepare you for something so specialised you will be doing on your own – it's not really a speciality where you can get help over the phone, it happens right there in the moment'.

Prolonging the rotation would improve confidence amongst CSDs and 'cement the knowledge and skills learned'. They 'just got the hang of it' at two months, after which they need some time to gain confidence and better prepare them to work in rural hospitals.

Second year: Placing the anaesthesia rotation in the second year of internship would allow interns to benefit most from the rotation. If the anaesthesia rotation is too early in internship, CSDs felt they forgot their skills by the time they needed them and also became less confident. 'As time goes by you become out of practice and less confident, you forget the skills learned.' Previous studies have shown that skills learned decay faster than knowledge. The average retention of ALS skills seems to vary between 6 and 12 months.[18]

Another reason for doing anaesthesia later during internship is that the experience from other rotations could serve as 'building blocks' for the anaesthesia rotation. 'I would have preferred to do anaesthetics in the second year, having more experience as a whole by then.'

Focus of the rotation: 'I did not see many of those tertiary type patients in community service.'

The intern training should primarily focus on the needs of the CSD in a rural area. This includes training on anaesthesia resource-limited areas, the safe use of ketamine, safe sedation skills and regional anaesthesia.

The training should also be focused on core essentials and basic knowledge. One previous intern replied:

> '… there was far too much emphasis on unnecessary detail without enough emphasis on the basics that are inevitably needed in district medicine. The concepts were blurry in my mind because of an excess of superfluous information (e.g. blood gas partition co-efficient and SVP etc.) and a lack of simplicity and clarity regarding the important things.'

Even though interns are probably taught the basics they struggle to make a 'distinction between essential information and nice-to-know information and subsequently have no confidence in either'.

Is recipe-book anaesthesia the answer? Will this at least ensure competence in some key areas of anaesthesia? This approach could equip junior doctors with necessary skills for simple cases. However, this approach can only be useful if accompanied by the necessary cognitive and clinical skills that would enable doctors to understand when not to use the prescribed recipe. Feedback from previous interns who have experienced rural anaesthesia as well as trainers should be used to create 'core competencies'. This should be followed by focused anaesthesia training during internship. These competencies could be taught in simulation exercises and practical sessions.

Assessments: Previous interns felt that structured, more standardised, more frequent assessments would improve their confidence in administering anaesthesia. Assessments should be focused on the evaluation of interns' achievements of core competencies set out by the intern training programme. It should be aimed at assessing the translation of knowledge into clinical skills, and not merely theory.[16] The PMB intern programme has subsequently already included more frequent assessments.

Conclusion

The aim of the paper was for the authors to understand the experiences of community service doctors and to get their feedback on their needs for intern training in anaesthesia. It highlights the importance of a well-structured intern rotation in anaesthesia as CSDs felt stressed and poorly supervised, especially in rural hospitals. They felt that more autonomy and more hands-on experience during internship would have benefited them during community service.

A possible plan to ensure that CSDs feel more confident administering anaesthesia could include the following:

- Medical schools must start a uniform training programme in anaesthesia, to ensure an equal insertion point of interns once they start internship.
- Intern programmes should be structured and focused, to best prepare doctors for community service. The authors recommend the development of a structured curriculum for intern training, to cover all aspects of anaesthesia most likely to be encountered during community service. Pre-rotation preparation, standardised assessment and simulation should also be included in the rotation. Also, the importance of autonomy and hands-on training should be emphasised to trainers.
- Prolonging the anaesthesia rotation to three to four months should be considered by the HPCSA. This would have implications for other rotations.
- Hospitals where CSDs work must ensure adequate working conditions and support for CSDs administering anaesthesia.

It is also important for intern training hospitals to incorporate feedback from previous interns into existing training programmes. This feedback should ideally include short-term feedback, immediately after the anaesthesia rotation, and longer term feedback, after completion of community service. This feedback can be used to structure a perfect intern training programme in anaesthesia.

Limitations of the study include the concern about the reliability of survey-type research. Results could be biased, depending on respondents to the survey.

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References

1. Meara JG, Leather AJM, Hagander L, et al. Global surgery 2030: evidence and solutions for achieving health, welfare, and economic development. Lancet. 2015;386:569–624. http://dx.doi.org/10.1016/S0140-6736(15)60160-X
2. Patel N, Peffer M, Leusink A, et al. Surgery and anaesthesia in the South African context: looking forward. S Afr Med J. 2016;106(2):135–6. http://dx.doi.org/10.7196/SAMJ.2016.v106i2.10529
3. Boelen C, Heck J. Defining and measuring the social accountability of medical schools. Geneva, Switzerland: World Health Organization; 1995. 53 p.
4. Burch V, Van Heerden B. Are community service doctors equipped to address priority health needs in South Africa? Editorial. S Afr Med J. 2013;103(12):905. http://dx.doi.org/10.7196/SAMJ.7198

5. Lamacraft G, Kenny PJ, Diedericks BJ, et al. Training and experience of doctors administering obstetric anaesthesia in the free state level 1 and 2 hospitals. S Afr J Anaesth Analg. 2008;14(2):13–7.
6. Nemutandani MS, Maluleke FRS, Rudolph MJ. Community service doctors in Limpopo province. S Afr Med J. 2006;180–2.
7. Nkabinde TC, Ross A, Reid S, et al. Internship training adequately prepares South African medical graduates for community service – with exceptions. S Afr Med J. 2013;103(12):930–4. http://dx.doi.org/10.7196/SAMJ.6702
8. Pattinson RC, editor. Saving mothers. Sixth report on confidential enquiry into maternal deaths in South Africa, 2011–2013.
9. Ash S. A comparison of two-months versus two-weeks of internship anaesthesia training. S Afr J Anaesth Analg. 2009;15(1):23–32.
10. Kusel B, Farina Z, Aldous C. Anaesthesia training for interns at a metropolitan training complex: does it make the grade? S Afr Fam Pract. 2014;56(3):1–5.
11. Harris PA, Taylor R, Thielke R, et al. Research electronic data capture (REDCap) – a metadata-driven methodology and workflow process for providing translational research informatics support. J Biomed Inform. 2009;42(2):377–81. http://dx.doi.org/10.1016/j.jbi.2008.08.010
12. South African society of anaesthesiologists practice guidelines 2012. S Afr J Anaesth Analg. 2013;19(1):S1–S42.
13. Rout CC, Farina Z. Anaesthesia-related maternal deaths in South Africa. Chapter seven of the 5th saving mothers report 2008–2010. S Afr J Anaesth Analg. 2012;8(6):281–301.
14. www.oxfordlearnersdictionaries.com.
15. Kusurkar RA, Croiset G. Autonomy support for autonomous motivation in medical education: letter to the editor. Med Educ Online. 2015;20:27951. http://dx.doi.org/10.3402/meo.v20.27951
16. Halpern SD, Detsky AS. Graded autonomy in medical education — Managing things that go bump in the night. N Engl J Med. 370(12):1086–89.
17. Yardley S, Teunissen PW, Dornan T. Experiential learning: transforming theory into practice. Med Teach. 34(2):161–4.
18. Yang CW, Yen ZS, McGowan JE, et al. A systematic review of retention of adult advanced life support knowledge and skills in healthcare providers. Resuscitation 2012;83(9):1055–60. http://dx.doi.org/10.1016/j.resuscitation.2012.02.027

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