

https://dspace.org/

Knowledge of anaesthetists in a department of anaesthesiology regarding “do not resuscitate” orders during the perioperative period

Monchwe, Tebogo Benedict

2022

https://hdl.handle.net/10539/35193

Downloaded from a DSpace repository. https://dspace.org/

Knowledge of anaesthetists in a department of anaesthesiology regarding “do not resuscitate” orders during the perioperative period

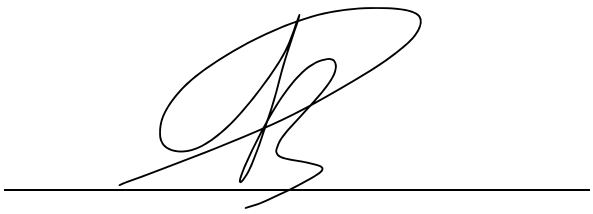
Tebogo Benedict Monchwe

A research report submitted to the Faculty of Health Sciences, University of the Witwatersrand, Johannesburg in partial fulfilment of the requirements for the degree of Master of Medicine in the branch of Anaesthesiology.

Johannesburg, 2021

Declaration

I, Tebogo Benedict Monchwe declare that this research report is my own unaided work. It is being submitted for the Degree of Master of Medicine in the branch of Anaesthesiology at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other University.



02 November 2021

This research is dedicated to Thatayame, Nkhono and Mmasolly Tshabang and Mojahi Motoko. Your song may have stopped but your melodies linger on. Continue resting in eternal power and peace.

Abstract

Background

The ethical principle of autonomy is codified in the constitutional and legislative laws governing South Africa. Patients have the right to refuse life-prolonging or sustaining medical therapies; this is inclusive of their right to have directives indicating orders not to resuscitate in possible critical circumstances. The aim of this study was to assess the knowledge of anaesthetists regarding do not resuscitate (DNR) orders during the perioperative period in the Department of Anaesthesiology at the University of the Witwatersrand.

Methods

A cross-sectional, contextual research study design was followed using an anonymous self-administered online questionnaire. The study population consisted of anaesthetists working in the department. Convenience sampling was used. An online submission of the questionnaire implied consent. Adequate knowledge was defined as a score of ≥60% as determined by the Angoff method.

Results

The participants mean (SD) score was 63.5% (11.8%), with seniors obtaining a score of 65.3% (12.4%) and juniors 62.4% (11.2%). This difference was not statistically significant (p=0.262). Of the 83 (57.2%) participants who achieved a pass score, 36 (59%) were seniors and 47 (56%) were juniors. This difference was not statistically significant (p=0.100).

Conclusion

A mean score of 63.5% was achieved by participants in this study indicating adequate knowledge. However, only 57.2% obtained a pass mark of ≥60%. The majority of participants had limited training and experience regarding DNR orders and therefore the feeling of discomfort while treating these patients as a finding was expected. With an estimated 15% of patients having a living will specifying DNR orders and still choosing to undergo surgical procedures, it is important for the anaesthetist to have training and adequate knowledge of DNR orders.

Acknowledgements

This work would not have been possible if not through the omniscient advice and sleepless nights of Juan and Helen.

To Blaise, thank you for the comic relief.

To the Wits Department of Anaesthesiology, I thank you.

My extended and close family, and friends, thank you for your steadfast support.

Most of all, my mother Nkhononyane who, against all odds, committed herself to making sure that our circumstance created by the legacy of the apartheid past does not define our future. You are my anchor, thank you for your commitment to all your children.

Table of contents

Declaration ii

Abstract iv

Acknowledgements v

Abbreviations x

Statement xi

Section 1: Review of the literature 1

1.1 Introduction 1

1.2 Individual autonomy and health care choices in the South African context 1

1.3 DNR orders and the anaesthetist 4

1.4 Ethical competence and DNR orders 6

1.4.1 Learning and developing ethical competence regarding DNR orders 6

1.4.2 Health care providers' knowledge of DNR orders 7

Assessed knowledge 7

Self-reported knowledge 8

1.5 Health care providers' comfort with treating patients with DNR orders 8

1.6 Summary 9

1.7 References 10

Section 2: Author guidelines 16

Section 3: Draft article 24

Section 4: Proposal 43

4.1 Introduction and problem statement....44
4.2 Aim and objectives....46
4.2.1 Aim....46
4.2.2 Objectives....46
4.3 Research assumptions....46
4.4 Demarcation of study field....47
4.5 Ethical considerations....48
4.6 Research methodology....49
4.6.1 Research design....49
4.6.2 Study population....49
4.6.3 Study sample....49
4.6.4 Data collection....50
4.6.5 Data analysis....52
4.7 Significance of the study....53
4.8 Validity and reliability of the study....53
4.9 Potential limitations....53
4.10 Project outline....55
4.10.1 Time frame....55
4.10.2 Budget....55
4.11 References....56
4.12 Appendices....60

Section 5: Annexures 73

5.1 Ethics approval.....73

5.2 Graduate studies approval.....74

5.3 Turnitin report.....75

List of tables

Table 1: Characteristics of participants.....30

Table 2: Training, experience and comfort with DNR orders.....31

Table 3: Ethical and legal knowledge questions pertaining to DNR orders.....32

Table 4: Self-perceived knowledge regarding the laws, guidelines and ethical principles of DNR orders.....34

Abbreviations

CPR	Cardiopulmonary resuscitation
DNR	Do not resuscitate
HPCSA	Health Professions Council of South Africa
PVS	Persistent vegetative state
Wits	University of the Witwatersrand

Statement

The Research Report consists of a literature review, draft article, study proposal and appendices. The study proposal is included for background reference and is not for examination.

The formatting of this Research Report complies with the University of the Witwatersrand's Style Guide for Theses, Dissertations and Research Reports. The formatting of the draft article may differ from the author guidelines of the Southern African Journal of Anaesthesia and Analgesia, the journal to which it is intended to be submitted, in order to comply with the University's style guide.

Section 1: Review of the literature

1.1 Introduction

In this section, individual autonomy and health care choices in the South African context, do not resuscitate (DNR) orders and the anaesthetist, ethical competence and DNR orders, learning and developing of ethical competence regarding DNR orders, health care providers' knowledge of DNR orders and health care providers' comfort with treating patients with DNR orders will be discussed.

1.2 Individual autonomy and health care choices in the South African context

Death was once a matter of fate, and now, it is increasingly becoming a matter of human choice (1). The right to self-determination or self-rule is codified in Chapter 2 of the Constitution of the Republic of South Africa Act No. 108 of 1996 (2) (hereafter referred to as the Constitution). This right embodies the ethical principle known as autonomy (3). The right to autonomy allows an individual to express in writing directives addressing future health care wishes (4). Living wills, durable power of attorney and related DNR orders fall under the umbrella term advanced directives (5). These are legal instruments through which an individual make decisions about future life-sustaining treatments, which should be respected and implemented even when the individual no longer has decisional capacity (6).

Regarding individual autonomy, the Constitution (2) further states in Section 12.2 that "everyone has the right to bodily and psychological integrity, which includes the right to security in and control over their body". According to Nienaber and Bailey (7), this implies the right to make decisions concerning one's body without undue interference from others. However, Herring (8) warns that this right should be interpreted with caution; individuals can choose to have treatment or not but do not have the right to dictate what treatment they should receive. Nienaber and Bailey (7) state that "It should be the norm that patients decision to refuse treatment stands unless the interest of justice or the community permit otherwise."

The inherent non-derogable right to human dignity is protected entirely by Section 10 of the Constitution (2). This human right to intrinsic dignity would include dying with dignity, and it must be respected (9-12). Providing a dignified death in the perioperative period to an individual with a directive stating their DNR wishes is further supported by the ethical principles of beneficence and non-maleficence (13). Beneficence refers to the act of doing good for the individual, while non-maleficence refers to the do no harm ethos (3). Artificially prolonging or sustaining life can be detrimental to the individual's dignity and quality of life, particularly when there is little to no hope of recovery (11, 14). Health care providers face situations where they may either need to withhold or withdraw treatment modalities that artificially prolong or sustain life as the burden and risk of continuing these modalities are outweighed by the benefit (11, 14). In making these decisions, the individual or their surrogate decision-maker should be involved (11, 15). In those lacking decisional capacity, the ethical principles of beneficence and non-maleficence need to be balanced to determine their best interest (3, 15).

Chapter 2 of the National Health Act of South Africa No. 61 of 2003 (15) (hereafter referred to as the Health Act) and the National Patients' Rights Charter (16) (hereafter referred to as the Charter) provide that individuals have the right to autonomy regarding their health care wishes. Health care providers must inform individuals of the range of diagnostic and therapeutic options, the risks, benefits and costs of these options, and the individual's right to refuse these provided that the informed refusal of such options does not endanger the health of others (15). Individuals are also entitled to be provided with information regarding their health condition or circumstances unless they have expressed otherwise so that they can plan for their possible health care needs (15). However, if there is substantial evidence that this information may not be in the individual's best interest, the health care provider has the right to withhold such information (11, 15).

Section 7.1 of the Health Act (15) further states that in cases where individuals are not able to grant informed consent regarding their health care wishes due to a lack of decisional capacity, the individual can mandate in writing a health care proxy to make decisions on their behalf. When the individual lacks decisional capacity and has a directive nominating a health care proxy, the individual must as far as

possible still be included in the decision-making process. If an individual has not nominated a proxy, one of the following surrogates listed in order of priority may make decisions on the individual's behalf: a person authorised by any law or court order, spouse or partner, parent, grandparent, adult child or brother or sister (15).

The individual's autonomy regarding health care choices in South Africa is also addressed in the Health Professions Council of South Africa Guidelines for the Withholding and Withdrawing of Treatment (11) (hereafter referred to as the HPCSA Guidelines). This guideline is based on the World Medical Association Declaration on Terminal Illness (14). The HPCSA Guidelines (11) emphasise that the relationship between the individual and the health care provider is based on "mutual trust and professionalism" and that the practice of health care is a "moral enterprise". Furthermore, the HPCSA Guidelines make a firm statement that the standards set in the guidelines will be used in the evaluation of complaints of professional misconduct. The HPCSA Guidelines elaborate on the Health Act by addressing advance directives and health care proxies. The human right to intrinsic dignity is also stressed in the HPCSA Guidelines (11).

It is important to note that the individual's right to autonomy may be influenced by the resource-limited South African context. The HPCSA Guidelines (11) draw attention to distributive justice, individual autonomy versus the community's greater good. Withholding of treatment may not always be in the best interest of the individual. This may be in direct conflict with the principles of beneficence and non-maleficence, which may impact the individual's right to autonomy. In the HPCSA Guidelines, provision is made for withholding of treatment due to the scarcity of resources. The HPCSA Guidelines state that health care institutions have the right to limit life-sustaining treatments without the individual's informed consent. However, if the individual meets the criteria for the administration of these life-sustaining treatments and the health care institution cannot offer the treatment based on resource scarcity, the institution must make the necessary efforts to ensure that the individual is transferred to another health care institution where such resources are available. The HPCSA Guidelines warn that the provision of futile medical care for the sole purpose of financial gain is unethical (11).

1.3 DNR orders and the anaesthetist

DNR orders are a form of passive euthanasia (17) and only apply to withholding or withdrawing of cardiopulmonary resuscitation (CPR) (11, 17). DNR orders may be considered lawful when:

- attempts at CPR are considered to be futile according to clinical judgement,
- it has been decided by the individual or their surrogate decision-maker that the risks and burdens of CPR outweigh the benefits,
- an individual with decisional capacity makes the informed decision to refuse such attempts or makes an advance refusal of such attempts (17).

Orders not to attempt resuscitation are just that. These orders do not preclude health care providers from their responsibilities of administering ethically and clinically sound appropriate and aggressive end-of-life care treatment (11, 14)

Extension of DNR orders to the perioperative period has been met with some resistance, with Truog (18) making the first published argument for their automatic suspension. The author argues that the practice of anaesthesia is unique as pharmacological agents that disturb homeostasis are administered to provide a balanced anaesthetic and if an iatrogenic cardiopulmonary arrest is to occur in the operating room, not resuscitating such an individual may be unethical (18). However, the automatic suspension of DNR orders impedes the ethical principle of autonomy as provided for by the Constitution (2) and the Health Act (15). Position statements by the American Society of Anesthesiologists(19), American College of Surgeons(20) and Association of periOperative Registered Nurses (21) advocate for reconsideration of DNR orders in the perioperative period. The HPCSA Guidelines (11) also recommend that individuals should be given the opportunity to reconsider and re-evaluate their advance directives regularly and not only perioperatively.

The concerns regarding DNR orders in the perioperative period can be divided into two main categories: concerns regarding the validity and reliability of the DNR order itself and difficulties related to the nature of the operating room environment (22). Regarding the validity and reliability of the DNR orders, Ewanchuk and

Brindley (22) argue that the anaesthetist is usually not the primary health care provider; thus, there may be some scepticism regarding the DNR order. The authors further argue that the DNR orders may either be overly vague or restrictive, thus making its usage in the operating room challenging.

The nature of the operating room environment, as argued by Truog (18), involves deliberate disruption of cardiopulmonary homeostasis followed by resuscitation, including ventilatory support. Thus, resuscitation is the primary role of the anaesthetist and does not constitute an extraordinary intervention. What could be considered extraordinary may be the use of chest compressions or electrical cardioversion (22). Therefore, requiring anaesthetists not to resuscitate may be fundamentally flawed, and anaesthetists may find it morally distressing to provide care to individuals with DNR orders (23). In a systematic review (24), it was demonstrated that the overall survival following perioperative CPR ranged between 32 — 55.7% with a viable survival of 25% when adjusted for neurological outcome at follow up, while out of hospital cardiac arrest survival rates range from 2 — 11% globally (25). Thus, not allowing individuals the opportunity to reconsider their DNR orders in the perioperative period based on anecdotal favourable survival rates after CPR in the perioperative period may be flawed.

It is estimated that 15% of patients with DNR orders still choose to undergo surgical procedures (21, 26, 27). However, no studies were identified assessing the rationale for surgical patients with DNR orders choosing to accept a surgical intervention (28). In non-surgical terminally ill patient studies, it has been documented that even though they have DNR orders in place, they would still consider a surgical intervention if the intervention will result in a return to “present quality of life” (29, 30). A systematic review (28) suggests that in non-surgical patients, health care providers tend to provide less aggressive medical treatment to patients with DNR orders. However, this bias is not evident in surgical patients with DNR orders. It was also documented that surgical procedures in patients with DNR orders compared to those without tend to be of similar duration and complexity with similar postoperative complication rates observed between these two groups (28).

1.4 Ethical competence and DNR orders

The availability of ethical guidelines and legislation has grown exponentially, resulting in an increased interest in ethical competence (31). Eriksson et al (31) suggest a communicative model of being, doing and knowing to address ethical competence. The ethics of being or virtue ethics refers to the good character traits that the health care provider needs to be ethically competent in addition to having knowledge about ethics (31). Pettersson et al (32) identified empathy, respect, compassion, openness, courage and humbleness as character traits that will contribute to a health care provider's ethical competence regarding DNR orders.

The ethics of doing refers to how the health care provider should act in certain ethical circumstances (32). The legal framework for guiding health care providers regarding DNR orders in the South African context has been addressed in Sections 1.2 and 1.3.

Eriksson et al (31) emphasise that although being and doing are important components of ethical competency; the health care provider also needs to "know" to be ethically competent. Learning and developing ethical competence and the knowledge of health care providers of DNR orders address the knowing of ethical competence and will be discussed.

1.4.1 Learning and developing ethical competence regarding DNR orders

Inadequate theoretical teaching regarding the ethics guiding DNR orders is pervasive. Pettersson et al (32) reported that physicians and nurses in their qualitative study in Sweden mainly received theoretical ethics education during their undergraduate training. Participants express the need for more formal ethics training programs to better prepare for clinical practice. Junod Perron et al (33) stated that one of the possible reasons that only 31% of the junior internal medicine trainees could correctly define DNR orders was that Swiss undergraduate medical students receive little to no training in medical ethics. Hadler et al (34) concluded that at their institution, training of surgeons and anaesthetists in implementing DNR orders was lacking, and their practises and understanding were contrary to clear and well-defined professional guidelines. The authors highlighted that understanding and practises of DNR orders were possibly

further influenced by the generational gap between trainees' and attending physicians' beliefs and practices (34). Similarly, Sanderson et al (35) reported that physicians and nurses working in the intensive care units of two Boston children's hospitals received very little under- and postgraduate training regarding DNR orders.

Although theoretical ethical education is essential, Pettersson et al (32) reported that participants interviewed were of the opinion that theoretical education alone is not enough, as it will not make engaging with difficult situations less difficult. The participants suggested that the best way to learn was by gaining experience while supervised by an experienced supervisor. The participants also indicated self-reflection as a learning tool. Self-reflection entails reflecting on decisions, what was done and why and how others perceived the decisions and how these affected others. Lastly, the participants stated that a working climate conducive to ethical discussion further enhances ethical learning (32).

1.4.2 Health care providers' knowledge of DNR orders

Assessed knowledge

Limited literature was identified addressing knowledge of anaesthetists and other health care providers regarding DNR orders in the perioperative period. This section will focus on the health care providers' knowledge of DNR orders.

Mullan et al (36), in 2002, in an upper Midwest United States region multicentre study, assessed knowledge of end-of-life care, which included the discussion and knowledge pertaining to advance directives and resuscitation orders of program directors, faculty and internal medicine trainees. A small but statistically significant mean score of 52.1% was obtained by the faculty and the residents. The faculty and the residents attained a mean score of 57.6% and 48.9% respectively (36).

Average knowledge of DNR orders was reported in three studies (37-39). Schroder et al (37), in 2009 at five universities in Canada, assessed internal medicine residents' knowledge of end-of-life care including DNR orders. The mean score obtained by the residents was 64.6%, with no difference between the residents' years of training. Zhou et al (38), in a study among oncology advance

practice nurses in the United States of America in 2010, reported a knowledge score of 67%. The authors suggest that the low score may have been a barrier to implementing advanced care planning practices. In a single centre study in Chicago in 2017, Sharma et al (40), in a randomised control trial determined the baseline knowledge of hospitalists in the control arm of the study to be 63.2%.

Tchorz et al (39), in Ohio in 2013, assessed third-year medical students' knowledge of DNR orders among other palliative and end-of-life care topics. All 97 students passed with a mean score of 90.3%. Palliative and end-of-life care topics were included in these students' curriculum.

Self-reported knowledge

This section focuses on the health care providers' self-reported knowledge of DNR orders as part of palliative and end-of-life care and advance care planning.

Schroder et al (37), in 2009 at five universities in Canada, assessed internal medicine residents knowledge of end-of-life care including DNR orders. The residents rated their knowledge of end-of-life care as average, with a score of 3 out of 5. In a 2010 study by Ramírez-Rivera et al (41), in Puerto Rico, 25% of the internal medicine residents rated their knowledge of DNR orders as less than 7 out of 10.

Keon-Cohen et al (42), in a 2017 study of 290 junior and senior anaesthetists in Australia and New Zealand demonstrated that 75% of the anaesthetists reported having very low to moderate knowledge pertaining to DNR orders during the perioperative period.

1.5 Health care providers' comfort with treating patients with DNR orders

Studies have shown that health care providers experience discomfort when engaging with patients with DNR orders (43-48).

Minto and Strickland (45) reported that primary health care providers in a qualitative study in England stated that discussing advanced care plans and caring for patients with advanced care plans substantially affected them. Most of these

primary health care workers became distressed when applying advanced care plans. Some showed outward expression of emotions, such as shedding a tear, while others used avoidance tactics.

Nankundwa and Brysiewicz (49), relating the lived experiences of Rwandan intensive care nurses caring for patients with DNR orders, stated that the nurses experienced emotional distress and that the DNR orders became a barrier to delivering optimal intensive care. The nurses felt discouraged with feelings of stress, frustration, anger, sadness, helplessness and moral distress.

Health care providers have reported that experience in dealing with patients with DNR (45, 50) orders and learning from an experienced health care provider (45) does help emotional distress.

1.6 Summary

In this section, individual autonomy and health care choices in the South African context, DNR orders and the anaesthetist, ethical competence and DNR orders, learning and developing of ethical competence regarding DNR orders, health care providers' knowledge of DNR orders and health care providers' comfort with treating patients with DNR orders were discussed.

1.7 References

1. Southern African Legal Information Institute. Constitutional Court of South Africa: Soobramoney v Minister of Health (Kwazulu-Natal) (CCT32/97) [1997] ZACC 17; 1998 (1) SA 765 (CC); 1997 (12) BCLR 1696 (27 November 1997). 2021. [cited 20 February 2020]. Available from: http://www.saflii.org/za/cases/ZACC/1997/17.html.

2. South Africa. Constitution of the Republic of South Africa Act No. 108 of 1996. Pretoria, South Africa: Government Printer; 1997.

3. Mash B. Handbook of family medicine. 2nd ed. Cape Town, South Africa: Oxford University Press Southern Africa; 2006.

4. South Africa Medical Association Human Rights Law and Ethics Unit. South Africa Medical Association living wills and advance directives. 2012. [cited 20 February 2020]. Available from: https://www.samedical.org/images/attachments/guidelines-with-regard-to-living-wills-2012.pdf.

5. Thomas W, Ziel SE, Harris AV. Advance directives in the perioperative setting. AORN J. 1997;66(4):706-8. DOI: 10.1016/s0001-2092(06)62927-x.

6. Jones JW, McCullough LB. Just how far goes DNR? J Vasc Surg. 2008;48(6):1630-2. DOI: 10.1016/j.jvs.2008.08.038.

7. Nienaber A, Bailey K. The right to physical integrity and informed refusal: Just how far does a patient's right to refuse medical treatment go? S Afr J Bioeth Law. 2016;9(2):73-7. DOI: 10.7196/SAJBL.2016.v9i2.472.

8. Herring J. Medical law and ethics. 8th ed. Oxford, United Kingdom: Oxford University Press; 2020.

9. Gwyther L, Brennan F, Harding R. Advancing palliative care as a human right. J Pain Symptom Manage. 2009;38(5):767-74. DOI: 10.1016/j.jpainsymman.2009.03.003.

10. Breitbart W. Palliative care as a human right: Update. Palliat Support Care. 2011;9(4):345-9. DOI: 10.1017/s1478951511000356.

11. Health Professions Council of South Africa. Ethical guidelines for good practice in the health care professions. Guidelines for the withholding and withdrawing of treatment. Booklet 7. 2016. [cited 10 February 2020]. Available from: https://www.hpcsa.co.za/Uploads/Professional_Practice/Ethics_Booklet.pdf.

12. Jones DA. Human dignity in healthcare: A virtue ethics approach. New Bioeth. 2015;21(1):87-97. DOI: 10.1179/2050287715z.00000000059.

13. Guarisco KK. Managing do-not-resuscitate orders in the perianesthesia period. J Perianesth Nurs. 2004;19(5):300-7.

14. World Medical Association. WMA Declaration of Venice on terminal illness. Adopted by the 35th World Medical Assembly, Venice, Italy, October 1983 and revised by the 57th WMA General Assembly, Pilanesberg, South Africa, October 2006. 2018. [cited 16 February 2020]. Available from: https://www.wma.net/policies-post/wma-declaration-of-venice-on-terminal-illness/.

15. South Africa. National Health Act No. 61 of 2003. Pretoria, South Africa: Government Printer; 2004.

16. Department of Health South Africa. The Patients' Rights Charter. Pretoria, South Africa: Government Printer; 2007.

17. McQuoid-Mason DJ. Emergency medical treatment and 'do not resuscitate' orders: When can they be used? S Afr Med J. 2013;103(4):223-5. DOI: 10.7196/samj.6672.

18. Truog RD. "Do-not-resuscitate" orders during anesthesia and surgery. Anesthesiology. 1991;74(3):606-8. DOI: 10.1097/00000542-199103000-00030.

19. American Society of Anesthesiologists. Ethical guidelines for the anesthesia care of patients with do-not-resuscitate orders or other directives that limit treatment. [cited 17 February 2020]. Available from: https://www.asahq.org/standards-and-guidelines/ethical-guidelines-for-the-

anesthesia-care-of-patients-with-do-not-resuscitate-orders-or-other-directives-that-limit-treatment.

20. American College of Surgeons. Statement on advance directives by patients: "Do not resuscitate" in the operating room. Bull Am Coll Surg. 2014;99(1):42-3.

21. Association of periOperative Registered Nurses. AORN position statement on perioperative care of patients with do-not-resuscitate or allow-natural death orders. 2020. [cited 17 February 2020]. Available from: https://www.aorn.org/guidelines/clinical-resources/position-statements.

22. Ewanchuk M, Brindley PG. Perioperative do-not-resuscitate orders: Doing 'nothing' when 'something' can be done. Crit Care. 2006;10(4):219. DOI: 10.1186/cc4929.

23. Truog RD, Waisel DB. Do-not-resuscitate orders: From the ward to the operating room; from procedures to goals. Int Anesthesiol Clin. 2001;39(3):53-65. DOI: 10.1097/00004311-200107000-00006.

24. Kalkman S, Hooft L, Meijerman JM, Knape JT, van Delden JJ. Survival after perioperative cardiopulmonary resuscitation: Providing an evidence base for ethical management of do-not-resuscitate orders. Anesthesiology. 2016;124(3):723-9. DOI: 10.1097/aln.0000000000000873.

25. Meaney PA, Bobrow BJ, Mancini ME, Christenson J, Caen AR, Bhanji F, et al. Cardiopulmonary resuscitation quality: Improving cardiac resuscitation outcomes both inside and outside the Hospital. Circulation. 2013;128(4):417-35. DOI: 10.1161/CIR.0b013e31829d8654.

26. Dugan D, Riseman J. Do-not-resuscitate orders in an operating room setting #292. J Palliat Med. 2015;18(7):638-9. DOI: 10.1089/jpm.2015.0163.

27. Margolis JO, McGrath BJ, Kussin PS, Schwinn DA. Do not resuscitate (DNR) orders during surgery: Ethical foundations for institutional policies in the United States. Anesth Analg. 1995;80(4):806-9. DOI: 10.1097/00000539-199504000-00027.

28. Scarborough JE, Pappas TN. The effect of do-not-resuscitate status on postoperative mortality in the elderly following emergency surgery. Adv Surg. 2013;47(1):213-25. DOI: 10.1016/j.yasu.2013.04.001.

29. Clemency MV, Thompson NJ. "Do not resuscitate" (DNR) orders in the perioperative period: A comparison of the perspectives of anesthesiologists, internists, and surgeons. Anesth Analg. 1994;78(4):651-8. DOI: 10.1213/00000539-199404000-00006.

30. Weeks JC, Cook EF, O'Day SJ, Peterson LM, Wenger N, Reding D, et al. Relationship between cancer patients' predictions of prognosis and their treatment preferences. JAMA. 1998;279(21):1709-14. DOI: 10.1001/jama.279.21.1709.

31. Eriksson S, Helgesson G, Höglund AT. Being, doing, and knowing: Developing ethical competence in health care. J Acad Ethics. 2007;5:207-16. DOI: 10.1007/s10805-007-9029-5.

32. Pettersson M, Hedström M, Höglund AT. Ethical competence in DNR decisions: A qualitative study of Swedish physicians and nurses working in hematology and oncology care. BMC Med Ethics. 2018;19(1):63. DOI: 10.1186/s12910-018-0300-7.

33. Junod Perron N, Morabia A, De Torrenté A. Evaluation of do not resuscitate orders (DNR) in a Swiss community hospital. J Med Ethics. 2002;28(6):364-7. DOI: 10.1136/jme.28.6.364.

34. Hadler RA, Neuman MD, Raper S, Fleisher LA. Advance directives and operating: Room for improvement? A A Case Rep. 2016;6(7):204-7. DOI: 10.1213/xaa.0000000000000269.

35. Sanderson A, Zurakowski D, Wolfe J. Clinician perspectives regarding the do-not-resuscitate order. JAMA Pediatr. 2013;167(10):954-8. DOI: 10.1001/jamapediatrics.2013.2204.

36. Mullan PB, Weissman DE, Ambuel B, von Gunten C. End-of-life care education in internal medicine residency programs: An interinstitutional study. J Palliat Med. 2002;5(4):487-96. DOI: 10.1089/109662102760269724.

37. Schroder C, Heyland D, Jiang X, Rocker G, Dodek P. Educating medical residents in end-of-life care: Insights from a multicenter survey. J Palliat Med. 2009;12(5):459-70. DOI: 10.1089/jpm.2008.0280.

38. Zhou G, Stoltzfus JC, Houldin AD, Parks SM, Swan BA. Knowledge, attitudes, and practice behaviors of oncology advanced practice nurses regarding advanced care planning for patients with cancer. Oncol Nurs Forum. 2010;37(6):E400-10. DOI: 10.1188/10.Onf.E400-e410.

39. Tchorz KM, Binder SB, White MT, Lawhorne LW, Bentley DM, Delaney EA, et al. Palliative and end-of-life care training during the surgical clerkship. J Surg Res. 2013;185(1):97-101. DOI: 10.1016/j.jss.2013.05.102.

40. Sharma RK, Szmuilowicz E, Ogunseitan A, Jones SF, Montalvo JA, O'Leary KJ, et al. Evaluation of a mastery learning intervention on hospitalists' code status discussion skills. J Pain Symptom Manage. 2017;53(6):1066-70. DOI: 10.1016/j.jpainsymman.2016.12.341.

41. Ramírez-Rivera J, Cánova-Díaz C, Hunter-Mellado R. Knowledge and implementation of the DNR in internal medicine teaching programs. P R Health Sci J. 2010;29(2):96-101.

42. Keon-Cohen Z, Myles PS, Story DA. A survey of Australian and New Zealand anaesthetists' attitudes towards resuscitation orders in the perioperative setting. Anaesth Intensive Care. 2017;45(3):396-402. DOI: 10.1177/0310057x1704500316.

43. Gigon F, Merlani P, Ricou B. Advance directives and communication skills of prehospital physicians involved in the care of cardiovascular patients. Medicine (Baltimore). 2015;94(49):e2112. DOI: 10.1097/md.0000000000002112.

44. Tulsky JA, Chesney MA, Lo B. How do medical residents discuss resuscitation with patients? J Gen Intern Med. 1995;10(8):436-42. DOI: 10.1007/bf02599915.

45. Minto F, Strickland K. Anticipating emotion: A qualitative study of advance care planning in the community setting. Int J Palliat Nurs. 2011;17(6):278-84. DOI: 10.12968/ijpn.2011.17.6.278.

46. Froggatt K, Vaughan S, Bernard C, Wild D. Advance care planning in care homes for older people: An English perspective. Palliat Med. 2009;23(4):332-8. DOI: 10.1177/0269216309103802.

47. Gigon F, Merlani P, Ricou B. Swiss physicians' perspectives on advance directives in elective cardiovascular surgery. Minerva Anestesiol. 2015;81(10):1061-75.

48. Evans N, Bausewein C, Meñaca A, Andrew EV, Higginson IJ, Harding R, et al. A critical review of advance directives in Germany: Attitudes, use and healthcare professionals' compliance. Patient Educ Couns. 2012;87(3):277-88. DOI: 10.1016/j.pec.2011.10.004.

49. Nankundwa E, Brysiewicz P. Lived experiences of Rwandan ICU nurses caring for patients with a do-not-resuscitate order. Southern African Journal of Critical Care. 2017;33(1):19-22. DOI: 10.7196/SAJCC.2017.v33i1.281.

50. Falcone JL, Claxton RN, Marshall GT. Communication skills training in surgical residency: A needs assessment and metacognition analysis of a difficult conversation objective structured clinical examination. J Surg Educ. 2014;71(3):309-15. DOI: 10.1016/j.jsurg.2013.09.020.

Section 2: Author guidelines

Southern African Journal of Anaesthesia and Analgesia (SAJAA)

Submitted manuscripts that are not in the correct format and without the required supporting documentation specified in these guidelines will be returned to the author(s) for correction and will delay publication.

AUTHORSHIP

Named authors must consent to publication **by signing a covering letter** which should be submitted as a supplementary file. Authorship should be based on substantial contribution to:

(i) conception, design, analysis and interpretation of data;

(ii) drafting or critical revision for important intellectual content; and

(iii) approval of the version to be published. These conditions must all be met (uniform requirements for manuscripts submitted to biomedical journals; refer to www.icmje.org); and

(iv) exact contribution of each author must be stated.

DECLARATION OF CONFLICT OF INTEREST

Authors must declare all sources of support for the research and any association with a product or subject that may constitute a conflict of interest. If there is no conflict of interest to declare please include the following statement: The authors declare no conflict of interest.

FUNDING SOURCE

All sources of funding should be declared. Also define the involvement of study sponsors in the study design, collection, analysis and interpretation of data; the writing of the manuscript; the decision to submit the manuscript for publication. If the study sponsors had no such involvement, this should be stated as follows: No funding source to be declared.

RESEARCH ETHICS COMMITTEE APPROVAL

The submitting author must provide written confirmation of Research Ethics Committee approval for all studies including case reports. The ethics committee as well as the approval number should be included.

STATISTICAL ANALYSIS

Authors are advised to involve medical statisticians at the protocol stage of their research project: to plan sample size, and the selection of appropriate statistical tests for analysis and presentation.

PROTECTION OF PATIENT'S RIGHTS TO PRIVACY

Identifying information should not be published in written descriptions, photographs, and pedigrees unless the information is essential for scientific purposes and the patient (or parent or guardian) gives informed written consent for publication. The patient should be shown the manuscript to be published. Refer to www.icmje.org.

ETHNIC CLASSIFICATION

The rationale for analysis based on racio-ethnic-cultural categorisation should be indicated.

CATEGORIES OF SUBMISSIONS

Shorter items are more likely to be accepted for publication, owing to space constraints and reader preferences.

Original articles

Original articles on research relevant to anaesthesia and analgesia should not exceed 3 200 words, no more than 30 references, with up to 6 tables or figures. A structured abstract under the following headings, Background, Methods, Results, and Conclusions is a requirement and should not exceed 300 words.

Clinical Review articles

Review articles relevant to anaesthesia and analgesia should not exceed 2 400 words, with a maximum of 20 references and no more than 6 tables or figures. A summary of 300 words or less is required.

Case reports

Case reports should not exceed 1 800 words with no more than 10 references. Figures are limited to 2 figures and may include images or photographs. The case report should have three headings: Summary (not exceeding 100 words), Case report (with no introduction) and Discussion. Case reports will be published online only. The summary and the URL will appear in the printed version.

Scientific Letters

Scientific Letters should not exceed 2 400 words with a maximum of 10 references. Only one table or illustration is permissible. A structured abstract under the following headings, Background, Methods, Results, and Conclusions, is a requirement and should not exceed 250 words.

Letters to the editor

Letters to the editor should be 800 words or less with only one image or table.

MANUSCRIPT PREPARATION

Refer to articles in recent issues for the presentation of headings and subheadings. If in doubt, refer to 'uniform requirements' - www.icmje.org. Manuscripts must be provided in **UK English**.

Qualification, affiliation and contact details

This information must be provided for ALL authors and must be submitted as a supplementary file.

Email addresses of all author must be provided.

ORCID number of **ALL** authors must be provided – if authors do not have ORCID, please register at https://orcid.org/

Abbreviations

All abbreviations should be spelt out when first used and thereafter used consistently, e.g. ‘intravenous (IV)’ or ‘Department of Health (DoH)’.

Scientific measurements

Scientific measurements must be expressed in SI units except blood pressure (mmHg) and haemoglobin (g/dl). Litres is denoted with a lowercase ‘l’ e.g. ‘ml’ for millilitres). Units should be preceded by a space (except for %), e.g. ‘40 kg’ and ‘20 cm’ but ‘50%’. Greater/smaller than signs (> and 40 years of age) should also be preceded by a space e.g. > 20 years. No spaces should precede ± and °, i.e. ‘35±6’ and ‘19°C’.

Numbers should be written as grouped per thousand-units, i.e. 4 000, 22 160…

Quotes should be placed in single quotation marks: i.e. The respondent stated: ‘…’ Round **brackets** (parentheses) should be used, as opposed to square brackets, which are reserved for denoting concentrations or insertions in direct quotes.

General formatting

The manuscript must be in Microsoft Word or RTF document format. Text must be 1,5-spaced, in 12-point Times New Roman font, and contain no unnecessary formatting (such as text in boxes, except for Tables). *The manuscript must be free of track changes.*

Disclaimers should follow the Conclusion and it should be in the following order: Acknowledgements, Declaration conflict of interest, Funding source, Ethics declaration and ORCID.

ILLUSTRATIONS AND TABLES

If tables or illustrations submitted have been published elsewhere, the author(s) should provide consent to republication obtained from the copyright holder.

Tables may be embedded in the manuscript file **and** provided as **'supplementary files'**. They must be numbered in Arabic numerals (1,2,3…) and referred to consecutively in the text (e.g. 'Table 1'). Tables should be constructed carefully and simply for intelligible data representation. Unnecessarily complicated tables are strongly discouraged. Tables must be cell-based (i.e. not constructed with text boxes, tabs or enters) and accompanied by a concise title and column headings. Footnotes must be indicated with consecutive use of the following symbols: * † ‡ § ¶ || then ** †† ‡‡ etc.

Figures must be numbered in Arabic numerals and referred to in the text e.g. '(Figure 1)'. Figure legends: Figure 1: 'Title…'. All illustrations/figures/graphs must be of **high resolution/quality**: 300 dpi or more is preferable, but images must not be resized to increase resolution. Unformatted and uncompressed images must be attached as '**supplementary files**' upon submission (not embedded in the accompanying manuscript). TIFF and PNG formats are preferable; JPEG and PDF formats are accepted, but authors must be wary of image compression. Illustrations and graphs prepared in Microsoft PowerPoint or Excel must be accompanied by the original workbook.

REFERENCES

Authors must verify references from the original sources. *Only complete, correctly formatted reference lists will be accepted.* Reference lists may be generated with the use of reference manager software, but the final document must be delinked from the reference database or otherwise generated manually. Citations should be inserted in the text as superscript, e.g. These regulations are endorsed by the World Health Organization,[2] and others.[3,4-6] The superscript reference number should come after the punctuation mark and should not be in brackets.

All references should be listed at the end of the article in numerical order of appearance in the **Vancouver style** (not alphabetical order). Approved

abbreviations of journal titles must be used; see the List of Journals in Index Medicus. Names and initials of all authors should be given; if there are more than six authors, the first four names should be given followed by et al. First and last page, volume and issue numbers should be given. **Wherever possible, references must be accompanied by a digital object identifier (DOI) link and PubMed ID (PMID)/PubMed Central ID (PMCID).** Authors are encouraged to use the DOI lookup service offered by CrossRef. Crossref DOIs should always be displayed as a full URL link in the form https://doi.org/10.xxxx/xxxxx

Journal references:

1. Jun BC, Song SW, Park CS, Lee DH. The analysis of maxillary sinus aeration according to aging process: volume assessment by 3-dimensional reconstruction by high-resolutional CT scanning. Otolaryngol Head Neck Surg. 2005 Mar;132(3):429-34.

2. Polgreen PM, Diekema DJ, Vandeberg J, Wiblin RT, et al. Risk factors for groin wound infection after femoral artery catheterization: a case-control study. Infect Control Hosp Epidemiol [Internet]. 2006 Jan [cited 2007 Jan 5];27(1):34-7. Available from: http://www.journals.uchicago.edu/ICHE/journal/issues/v27n1/2004069/2004069.web.pdf.

Book references: Jeffcoate N. Principles of Gynaecology. 4th ed. London: Butterworth, 1975:96-101. *Chapter/section in a book:* Weinstein L, Swartz MN. Pathogenic Properties of Invading Microorganisms. In: Sodeman WA jun, Sodeman WA, eds. Pathologic Physiology: Mechanisms of Disease. Philadelphia: WB Saunders, 1974:457-472.

Internet references: World Health Organization. The World Health Report 2002 - Reducing Risks, Promoting Healthy Life. Geneva: World Health Organization, 2002. http://www.who.int/whr/2002 (accessed 16 January 2010).

Other references (e.g. reports) should follow the same format: Author(s). Title. Publisher place: publisher name, year; pages. Cited manuscripts that have been accepted but not yet published can be included as references followed by '(in

press)'. Unpublished observations and personal communications in the text must not appear in the reference list. The full name of the source person must be provided for personal communications e.g. '…(Prof. Michael Jones, personal communication)'.

COVERING LETTER

A covering letter to the editor is mandatory and must include statements that the manuscript has not been published previously and is not under review elsewhere. It should state details of any prior publication of the research in abstract form or in Congress proceedings. The letter must declare if any of the authors have a conflict of interest and that the requirements for submission, including ethics approval and patient permission for case reports have been fulfilled. All authors must sign the covering letter.

REVIEW PROCESS

Manuscripts, after vetting by the editorial team, are assigned for peer-review to 2 reviewers, conversant with the particular field of research. The reviewers and the authors are blinded to each other's identity. The turn-around time for review and initial editorial decision notification aims to be within 6 weeks of submission.

PROOFS

A PDF proof of an article may be sent to the corresponding author before publication to resolve remaining queries. At that stage, **only** typographical changes are permitted; the corresponding author is required, having conferred with his/her co-authors, to reply within 2 working days in order for the article to be published in the issue for which it has been scheduled.

CHANGES OF ADDRESS

Please notify the editorial department of any contact detail changes, including email, to facilitate communication.

CHARGES

There is no charge for the publication of manuscripts.

Copyright Notice

By submitting manuscripts to SAJAA, authors of original articles are assigning copyright to the SA Society of Anaesthesiologists. Authors may use their own work after publication without written permission, provided they acknowledge the original source. Individuals and academic institutions may freely copy and distribute articles published in SAJAA for educational and research purposes without obtaining permission.

The work is licensed under a Creative Commons Attribution-Non-Commercial Works 4.0 South Africa License. The SAJAA does not hold itself responsible for statements made by the authors.

Privacy Statement

The names and email addresses entered in this journal site will be used exclusively for the stated purposes of this journal and will not be made available for any other purpose or to any other party.

Section 3: Draft article

Knowledge of anaesthetists in a department of anaesthesiology regarding "do not resuscitate" orders during the perioperative period

Tebogo Benedict Monchwe, MBChB (UCT), DA (SA)

Juan Scribante, PhD

Helen Perrie, MSc

Blaise Bayingana, MBChB (Wits), DA (SA), MMed (Anaes), FCA (SA)

Department of Anaesthesiology, School of Clinical Medicine, Faculty of Health Sciences, University of the Witwatersrand

Corresponding Author

T.B. Monchwe

Department of Anaesthesiology
Chris Hani Baragwanath Academic Hospital
26 Chris Hani Rd
Diepkloof, Soweto
Johannesburg
1860

t.b.monchwe@gmail.com

(011) 933 9334/5

Keywords: do not resuscitate orders, anaesthetists, knowledge

Abstract

Background

The ethical principle of autonomy is codified in the constitutional and legislative laws governing South Africa. Patients have the right to refuse life-prolonging or sustaining medical therapies; this is inclusive of their right to have directives indicating orders not to resuscitate in possible critical circumstances. The aim of this study was to assess the knowledge of anaesthetists regarding do not resuscitate (DNR) orders during the perioperative period in the Department of Anaesthesiology at the University of the Witwatersrand.

Methods

A cross-sectional, contextual research study design was followed using an anonymous self-administered online questionnaire. The study population consisted of anaesthetists working in the department. Convenience sampling was used. An online submission of the questionnaire implied consent. Adequate knowledge was defined as a score of ≥60% as determined by the Angoff method.

Results

The participants mean (SD) score was 63.5% (11.8%), with seniors obtaining a score of 65.3% (12.4%) and juniors 62.4% (11.2%). This difference was not statistically significant (p=0.262). Of the 83 (57.2%) participants who achieved a pass score, 36 (59%) were seniors and 47 (56%) were juniors. This difference was not statistically significant (p=0.100).

Conclusion

A mean score of 63.5% was achieved by participants in this study indicating adequate knowledge. However, only 57.2% obtained a pass mark of ≥60%. The majority of participants had limited training and experience regarding DNR orders and therefore the feeling of discomfort while treating these patients as a finding was expected. With an estimated 15% of patients having a living will specifying DNR orders and still choosing to undergo surgical procedures, it is important for the anaesthetist to have training and adequate knowledge of DNR orders.

Introduction

Patients have a constitutional right to make informed decisions regarding their health care. According to the National Patients' Rights Charter (1), "a person may refuse treatment and such refusal shall be verbal or in writing provided that such refusal does not endanger the health of others". This right to consent to or refuse treatment is based on the ethical principle of autonomy. Autonomy or "self-rule" refers to the right of every individual to make their own decisions (2). Section 7 of the National Health Act of South Africa No. 61 of 2003 (3) encourages patients to be informed about the implications, risks and obligations of their decision to refuse hospital treatment.

The Health Professions Council of South Africa (HPCSA) (4) supports the notion of autonomy proposed by the National Patients' Rights Charter (1) and the National Health Act of South Africa No. 61 of 2003 (3) in its guidelines for the withholding and withdrawal of treatment. According to these guidelines, patients must be allowed to indicate their wishes regarding future treatments and to have, in writing, their directives regarding care in possible critical circumstances (4). The guidelines further reiterate the mandate proposed in the National Health Act of South Africa No. 61 of 2003 (3) in allowing the patient to have, in writing, a surrogate decision-maker when they are unable to make health-care related decisions for themselves.

Living wills, durable power of attorney and related DNR orders all fall under the umbrella term "advanced directives" (5). The aforementioned are all legal instruments through which a patient makes decisions about future life-sustaining treatments, which should be respected and implemented when the patient is no longer mentally competent (6).

DNR orders are a form of passive euthanasia (7) and only apply to withholding or withdrawing of cardiopulmonary resuscitation (CPR) (4, 7). DNR orders are written by the treating physician, and the decision may be based on the following: the patient's wishes in an advance directive, informed refusal for treatment by the surrogate decision-maker, the futility of CPR and when the benefits of CPR are outweighed by the burdens and risks (7, 8).

The exact nature of what constitutes futility is not defined, but the American Medical Association (9) has suggested that it is when there is only a 0 — 13% chance of treatment success. In patients with DNR orders, aggressive medical therapy and appropriate end-of-life care should still be pursued (8, 10) unless the physician deems this futile or the patient or their surrogate has a directive indicating their care limitation preference (11-15).

It is estimated that 15% of patients with a living will specifying DNR orders still choose to undergo surgical procedures (16-18). Adherence to DNR orders in the perioperative period has not gained widespread momentum within the medical fraternity (12). One argument explaining this can be divided into two main categories: concerns regarding the validity and reliability of the DNR order itself and difficulties related to the nature of the operating room environment (19). Regarding the validity and reliability of the DNR orders, Ewanchuk and Brindley (19) argue that the anaesthetist is usually not the primary health care provider; thus, there may be some scepticism regarding this order. The authors further argue that the DNR orders may either be overly vague or restrictive, thus making their usage in the operating room challenging. Anaesthesia involves deliberate disruption of cardiopulmonary homeostasis followed by resuscitation, including ventilatory support (19, 20). Thus, resuscitation is the primary role of the anaesthetist and does not constitute extraordinary intervention. What could be considered extraordinary may be the use of chest compressions or electrical cardioversion (19). Therefore, requiring anaesthetists not to resuscitate may be fundamentally flawed, and they may find it morally distressing to provide care to patients with DNR orders (21).

There is a plethora of literature regarding perioperative DNR orders. However, limited literature assessing the knowledge of anaesthetists regarding DNR orders in the perioperative period were identified. The aim of this study was to assess the knowledge of anaesthetists regarding DNR orders during the perioperative period in the Department of Anaesthesiology at the University of the Witwatersrand (Wits).

Methods

A cross-sectional, contextual research study design was followed. Approval to conduct the study was obtained from the Wits Human Research Ethics Committee (Medical) (M200321).

The study population consisted of anaesthetists working in the Department of Anaesthesiology. Convenience sampling was used, and the sample size was determined by the response rate. The department consisted of 80 consultants, 10 career medical officers, 110 registrars and 38 medical officers. Questionnaires were distributed to all anaesthetists in the department via an online platform. A minimum response rate of 60% (143) of anaesthetists in the department was considered representative (22). Interns working in the department were excluded from the study. Junior anaesthetists included medical officers and registrars in their first three years of training. Senior anaesthetists included consultants and registrars with more than three years of training.

Following a review of the literature, a publication by McQuoid-Mason (7) was identified as appropriate to guide the development of the questionnaire. The ethical and legal framework that was used to inform the draft questionnaire included:

- the Constitution of the Republic of South Africa Act No. 108 of 1996 section 27 (23)
- the National Patients' Rights Charter (1)
- the National Health Act of South Africa No. 61 of 2003 (3)
- the HPCSA Guidelines for the Withholding and Withdrawing of Treatment, Booklet 7 (4)
- the South African Medical Association Guidelines on Living Wills and Advance Directives (24)
- the World Medical Association Declaration of Venice on Terminal Illness (10).

To ensure content and face validity, the draft questionnaire was reviewed by a senior anaesthesiologist with a postgraduate degree in bioethics, and the suggested changes were incorporated into the final questionnaire. The

questionnaire consisted of two sections. Section 1 requested participants' characteristics and training, experiences and comfort related to DNR orders. Section 2 contained a clinical scenario with 17 knowledge questions and a question relating to self-perceived knowledge.

Due to the regulations pertaining to public gatherings during the COVID-19 pandemic, anaesthetists were invited via email to participate in the study using an online platform. The email included an information letter and a link to the questionnaire. Online submission of the questionnaire implied consent.

Response from the anaesthetist completing the questionnaire was not linked to the email address used for the study invitation, thereby ensuring anonymity. Data collected through the electronic platform is housed in the Google Forms database and is password protected. A reminder was sent to all anaesthetists 7, 14 and 21 days after the initial email. Questionnaires took approximately 15 minutes to complete. The modified Angoff method (25) was used to determine adequate knowledge (pass mark) of ≥60%.

Data were analysed in consultation with a statistician using the statistical program R software (R version 3.4.2; https://www.r-project.org). Categorical variables were described using numbers and percentages and continuous variables using means and standard deviations. Comparison between the knowledge scores of junior and senior anaesthetists was made using an independent t-test. The comparisons between level of comfort and between passing and failing of junior and senior anaesthetists were made using Chi-square tests. A p-value ≤0.05 was considered statistically significant.

Results

Electronic survey questionnaires were sent to 238 anaesthetists, and 145 (60.9%) completed survey questionnaires were returned. The characteristics of the participants are shown in Table 1.

Table 1: Characteristics of participants

Characteristic	Overall (n=145)	Seniors (n=61)	Juniors (n=84)
	Number (%)		
Age (years)			
20 – 30	30 (20.7)	0 (0.0)	30 (100.0)
31 – 40	86 (59.3)	37 (43.0)	49 (57.0)
41 – 50	21 (14.5)	16 (76.2)	5 (23.8)
≥51	8 (5.5)	8 (100.0)	0 (0.0)
Gender			
Male	51 (35.2)	19 (37.3)	32 (62.7)
Female	94 (64.8)	42 (44.7)	52 (55.3)
Designation			
Medical officer	33 (22.8)		
Registrar year 1	14 (9.7)		
Registrar year 2	14 (9.7)		84 (57.9)
Registrar year 3	23 (15.9)		
Registrar year ≥4	16 (11.0)	61 (42.1)	
Consultant	45 (31.0)		

The training, experience and comfort of participants with DNR orders are shown in Table 2.

Table 2: Training, experience and comfort with DNR orders

	Overall (n=145)	Seniors (n=61)	Juniors (n=84)
	Number (%)		
Training received			
Yes	38 (26.2)	19 (31.1)	19 (22.6)
No	107 (73.8)	42 (68.9)	65 (77.4)
Type of training			
Formal	31 (81.6)	13 (68.4)	18 (94.7)
Informal	7 (18.4)	6 (31.6)	1 (5.3)
Treated patient with DNR order			
Yes	59 (40.7)	28 (45.9)	31 (36.9)
No	86 (59.3)	33 (54.1)	53 (63.1)
Number of DNR order patients treated			
1 – 3	32 (54.2)	13 (46.4)	19 (61.3)
4 – 6	10 (16.9)	3 (10.7)	7 (22.6)
7 – 9	5 (8.5)	4 (14.3)	1 (3.2)
≥10	12 (20.3)	8 (28.6)	4 (12.9)
Comfort with DNR order			
Very uncomfortable	13 (9.0)	4 (6.6)	9 (10.7)
Somewhat uncomfortable	33 (22.8)	15 (24.6)	18 (21.4)
Uncomfortable	44 (30.3)	9 (14.8)	35 (41.7)
Comfortable	12 (8.3)	5 (8.2)	7 (8.3)
Somewhat comfortable	39 (26.9)	24 (39.3)	15 (17.9)
Very comfortable	4 (2.8)	4 (6.6)	0 (0.0)

The mean (SD) score obtained was 63.5% (11.8%), with seniors obtaining a score of 65.3% (12.4%) and juniors 62.4% (11.2%). This difference was not statistically significant (p=0.262). Of the participants, 83 (57.2%) achieved a pass score of ≥60%. Of those who passed, 36 (59%) were seniors and 47 (56%) were juniors. There was no significant difference between the number of senior and junior participants who achieved a pass score (p=0.100). A brief description of the questionnaire scenario and other questions is shown in Table 3. The number of correct answers per question is indicated.

Table 3: Ethical and legal knowledge questions pertaining to DNR orders

Description of question	Overall (n=145)	Seniors (n=61)	Juniors (n=84)
	Number (%) correct		
Ethical and legal questions based on a case scenario			
A 30-year-old chronically ill quadriplegic patient with an advance directive stating her DNR wishes presents for emergency surgery.			
Reconsider DNR wishes in consultation with patient prior to surgery.	111 (76.6)	46 (75.4)	65 (77.4)
Patient receives a general anaesthetic. Complications develop during the procedure requiring CPR, which appears successful.			
Honour DNR wishes in consultation with surrogate decision-maker and keep patient comfortable.	85 (58.6)	33 (54.1)	52 (61.9)
Patient transferred to ICU. Requires redo procedure under regional anaesthesia; further complications develop requiring CPR.			
Considering DNR wishes, CPR should not be commenced?	93 (64.1)	41 (67.2)	52 (61.9)
If CPR commenced, should it be limited?	95 (65.5)	38 (62.3)	57 (67.9)
If limited CPR commenced, should the ATLS/ACLS principle (6Hs and 6Ts) be followed?	18 (12.4)	3 (4.9)	15 (17.9)
After a protracted ICU stay, the patient is declared to be in a persistent vegetative state.			
Considering the DNR wishes, should artificial nutrition be commenced?	57 (39.3)	19 (31.1)	38 (45.2)
In consultation with two senior independent clinicians, continued life-sustaining care is deemed futile.			
Considering DNR wishes, should withholding/withdrawing life-sustaining treatment be recommended?	136 (93.8)	60 (98.4)	76 (90.5)
Surrogate decision-maker nominated by patient refuses to consent to withdrawing/withholding life-sustaining treatment			
Should life-sustaining treatment be withheld/withdrawn?	79 (54.5)	27 (44.3)	52 (61.9)
DNR orders lawful when			
Patient makes informed decision to refuse CPR	133 (91.7)	57 (93.4)	76 (90.5)
Patient with decisional incapacity has an advance directive stating DNR wishes	89 (61.4)	46 (75.4)	43 (51.2)
Decision to refuse CPR is made by surrogate decision-maker	79 (54.5)	29 (47.5)	50 (59.5)
Continuing medical care deemed futile	108 (74.5)	48 (78.7)	60 (71.4)
Burden and risk of CPR outweigh the benefits	126 (86.9)	54 (88.5)	72 (85.7)
Euthanasia and DNR orders			
Are DNR orders a form of euthanasia?	18 (12.4)	3 (4.9)	15 (17.9)
Is passive euthanasia legal in South Africa?	58 (40.0)	28 (45.9)	30 (35.7)
Is active euthanasia legal in South Africa?	144 (99.3)	60 (98.4)	84 (100.0)
Is there a legal distinction between active and passive euthanasia?	98 (67.6)	42 (68.9)	56 (66.7)

Participants' rating of their self-perceived knowledge pertaining to the laws and ethical principles that guide DNR orders is shown in Table 4. When comparing the level of self-perceived knowledge between seniors and juniors, significantly more senior selected average knowledge regarding the National Health Act of South Africa No. 61 of 2003 (3), compared to juniors who mostly selected poor knowledge.

Table 4: Self-perceived knowledge regarding the laws, guidelines and ethical principles of DNR orders

	Overall (n=145)	Seniors (n=61)	Juniors (n=84)	p-value
	Number (%)			
Constitution of the Republic of South Africa Act No. 108 of 1996 section 27				
None	35 (24.1)	8 (13.1)	27 (32.1)	0.054
Poor	73 (50.3)	34 (55.7)	39 (46.4)	
Average	34 (23.4)	18 (29.5)	16 (19.0)	
Good	3 (2.1)	1 (1.6)	2 (2.4)	
National Patients' Rights Charter				
None	14 (9.7)	4 (6.6)	10 (11.9)	0.624
Poor	56 (38.6)	23 (37.7)	33 (39.3)	
Average	61 (42.1)	29 (47.5)	32 (38.1)	
Good	13 (9.0)	5 (8.2)	8 (9.5)	
Excellent	1 (0.7)	0 (0.0)	1 (1.2)	
National Health Act of South Africa No. 61 of 2003				
None	19 (13.1)	4 (6.6)	15 (17.9)	0.002
Poor	50 (34.5)	14 (23.0)	36 (42.9)	
Average	64 (44.1)	35 (57.4)	29 (34.5)	
Good	12 (8.3)	8 (13.1)	4 (4.8)	
Health Professions Council of South Africa, Guidelines for the Withholding and Withdrawing of Treatment, Booklet 7				
None	25 (17.2)	6 (9.8)	19 (22.6)	0.059
Poor	77 (53.1)	31 (50.8)	46 (54.8)	
Average	40 (27.6)	23 (37.7)	17 (20.2)	
Good	3 (2.1)	1 (1.6)	2 (2.4)	
South African Medical Association Guidelines on Living Wills and Advance Directives				
None	30 (20.7)	8 (13.1)	22 (26.2)	0.138
Poor	67 (46.2)	28 (45.9)	39 (46.4)	
Average	46 (31.7)	24 (39.3)	22 (26.2)	
Good	1 (0.7)	1 (1.6)	0 (0.0)	
Excellent	1 (0.7)	0 (0.0)	1 (1.2)	
World Medical Association Declaration of Venice on Terminal Illness				
None	56 (38.6)	21 (34.4)	35 (41.7)	0.053
Poor	67 (46.2)	25 (41.0)	42 (50.0)	
Average	21 (14.5)	14 (23.0)	7 (8.3)	
Good	1 (0.7)	1 (1.6)	0 (0.0)	

Discussion

Interest in ethical competence has increased over the past two decades, largely due to the exponential growth in the availability of ethical guidelines and legislature (26). Eriksson et al (26) suggest a communicative model of being, doing and knowing to address ethical competence. The ethics of being or virtue ethics refers to the good character traits that the health care provider needs to be ethically competent in addition to having knowledge about ethics (26). The ethics of doing refers to how the health care provider should act in certain ethical circumstances (27); this is well defined in the South African context (1, 3, 4, 10, 23, 24). Eriksson et al (26) emphasise that although being and doing are important components of ethical competency, the health care provider also needs the knowing component to be ethically competent. This study addressed the knowing component.

The participants in this study obtained a mean score of 63.5% and 57.2% obtained a pass mark of ≥60%. This is better than the mean of 52.1% achieved by the internal medicine residents and their faculty members in an upper Midwest United States region multicentre study (28). The mean score obtained in this study is similar to; the 64.6% obtained by internal medicine trainees in a multicentre Canadian study (29), the 67% achieved by advanced practice oncology nurses in an American single centre study (30) and the 63.2% baseline knowledge of hospitalists in the control arm of a randomised control trial in America (31). However, it is not as good as the 90.3% mean score obtained by third-year medical students in Ohio (32). It is important to note that palliative and end-of-life care topics were included in these students' curriculum.

In this study, only 26.2% of the participants received training regarding DNR orders. Pettersson et al (27) reported that physicians and nurses in their qualitative study in Sweden expressed the need for more formal ethics training programs to better prepare for clinical practice. Although theoretical ethical education is essential, the authors highlighted that the participants interviewed believed theoretical education alone is not enough, as it will not make engaging with difficult situations less difficult. The participants suggested that the best way to learn was by gaining experience while supervised by an experienced supervisor (27).

Seniors and juniors in this study had similar levels of knowledge, 65.3% and 62.4%, respectively. Mullan et al (28) reported a small but statistically significant difference between the knowledge scores of the faculty members (57.6%) and internal medicine residents (48.9%). Only 45.9% of the senior participants and 36.9% of the junior participants in this study have treated patients with DNR orders. This is not ideal, as the seniors who teach and supervise juniors did not have much more knowledge and experience than the juniors.

Studies have shown that health care providers experience discomfort when engaging with patients with DNR orders (33-38). Of the participants in this study, 62.1% rated themselves as experiencing discomfort when managing patients with DNR orders during the perioperative period. Nankundwa and Brysiewicz (39), relating the lived experiences of Rwandan intensive care nurses caring for patients with DNR orders, stated that the nurses experienced emotional distress and that the DNR orders became a barrier to delivering optimal intensive care. The nurses felt discouraged with feelings of stress, frustration, anger, sadness, helplessness and moral distress. Minto and Strickland (35) in England reported that most of primary health care providers became distressed when applying advanced care plans. Some showed outward expression of emotions, such as shedding a tear, while others used avoidance tactics (35).

This study was limited by only having assessed the knowing component of ethical competence. It is recommended that future research should focus on the being component of ethical competence. A further limitation of this study was that it was done contextually and may not reflect the knowledge of other anaesthetists. A national study assessing knowledge of DNR orders is recommended. With increasing litigation in the perioperative period, culturally sensitive and legally and ethically sound training addressing a holistic approach to patients with DNR orders in the perioperative period should receive more emphasis in the anaesthetic training programme.

Conclusion

A mean score of 63.5% was achieved by participants in this study indicating adequate knowledge. However, only 57.2% obtained a pass mark of ≥60%. The

majority of participants had limited training and experience regarding DNR orders and therefore the feeling of discomfort while treating these patients as a finding was expected. With an estimated 15% of patients having a living will specifying DNR orders and still choosing to undergo surgical procedures (16-18), it is important for the anaesthetist to have training and adequate knowledge of DNR orders.

Conflict of interest

The authors declare that we have no financial or personal relationships, which may have inappropriately influenced us in writing this paper.

Acknowledgement

This research was done in partial fulfilment of a Master of Medicine degree. The authors would like to thank Professor Neville Pillay for his statistical input.

References

1. Department of Health South Africa. The Patients' Rights Charter. Pretoria, South Africa: Government Printer; 2007.

2. Mash B. Handbook of family medicine. 2nd ed. Cape Town, South Africa: Oxford University Press Southern Africa; 2006.

3. South Africa. National Health Act No. 61 of 2003. Pretoria, South Africa: Government Printer; 2004.

4. Health Professions Council of South Africa. Ethical guidelines for good practice in the health care professions. Guidelines for the withholding and withdrawing of treatment. Booklet 7. 2016. [cited 10 February 2020]. Available from: https://www.hpcsa.co.za/Uploads/Professional_Practice/Ethics_Booklet.pdf.

5. Thomas W, Ziel SE, Harris AV. Advance directives in the perioperative setting. AORN J. 1997;66(4):706-8. DOI: 10.1016/s0001-2092(06)62927-x.

6. Jones JW, McCullough LB. Just how far goes DNR? J Vasc Surg. 2008;48(6):1630-2. DOI: 10.1016/j.jvs.2008.08.038.

7. McQuoid-Mason DJ. Emergency medical treatment and 'do not resuscitate' orders: When can they be used? S Afr Med J. 2013;103(4):223-5. DOI: 10.7196/samj.6672.

8. Shapiro ME, Singer EA. Perioperative advance directives: Do not resuscitate in the operating room. Surg Clin North Am. 2019;99(5):859-65. DOI: 10.1016/j.suc.2019.06.006.

9. American Medical Association. Council on ethical and judicial affairs: Guidelines for the appropriate use of do-not-resuscitate orders. JAMA. 1991;265(14):1868-71. DOI: 10.1001/jama.1991.03460140096034.

10. World Medical Association. WMA Declaration of Venice on terminal illness. Adopted by the 35th World Medical Assembly, Venice, Italy, October 1983 and revised by the 57th WMA General Assembly, Pilanesberg, South Africa, October

2006. 2018. [cited 16 February 2020]. Available from: https://www.wma.net/policies-post/wma-declaration-of-venice-on-terminal-illness/.

11. Keon-Cohen Z, Myles PS, Story DA. A survey of Australian and New Zealand anaesthetists' attitudes towards resuscitation orders in the perioperative setting. Anaesth Intensive Care. 2017;45(3):396-402. DOI: 10.1177/0310057x1704500316.

12. Knipe M, Hardman JG. I. Past, present, and future of 'do not attempt resuscitation' orders in the perioperative period. Br J Anaesth. 2013;111(6):861-3. DOI: 10.1093/bja/aet287.

13. Sumrall WD, Mahanna E, Sabharwal V, Marshall T. Do not resuscitate, anesthesia, and perioperative care: A not so clear order. Ochsner J. 2016;16(2):176-9.

14. Nabozny MJ, Steffens NM, Schwarze ML. When do not resuscitate is a nonchoice choice: A teachable moment. JAMA Intern Med. 2015;175(9):1444-5. DOI: 10.1001/jamainternmed.2015.2326.

15. Guarisco KK. Managing do-not-resuscitate orders in the perianesthesia period. J Perianesth Nurs. 2004;19(5):300-7.

16. Association of periOperative Registered Nurses. AORN position statement on perioperative care of patients with do-not-resuscitate or allow-natural death orders. 2020. [cited 17 February 2020]. Available from: https://www.aorn.org/guidelines/clinical-resources/position-statements.

17. Dugan D, Riseman J. Do-not-resuscitate orders in an operating room setting #292. J Palliat Med. 2015;18(7):638-9. DOI: 10.1089/jpm.2015.0163.

18. Margolis JO, McGrath BJ, Kussin PS, Schwinn DA. Do not resuscitate (DNR) orders during surgery: Ethical foundations for institutional policies in the United States. Anesth Analg. 1995;80(4):806-9. DOI: 10.1097/00000539-199504000-00027.

19. Ewanchuk M, Brindley PG. Perioperative do-not-resuscitate orders: Doing 'nothing' when 'something' can be done. Crit Care. 2006;10(4):219. DOI: 10.1186/cc4929.

20. Truog RD. "Do-not-resuscitate" orders during anesthesia and surgery. Anesthesiology. 1991;74(3):606-8. DOI: 10.1097/00000542-199103000-00030.

21. Truog RD, Waisel DB. Do-not-resuscitate orders: From the ward to the operating room; from procedures to goals. Int Anesthesiol Clin. 2001;39(3):53-65. DOI: 10.1097/00004311-200107000-00006.

22. Draugalis JR, Coons SJ, Plaza CM. Best practices for survey research reports: A synopsis for authors and reviewers. Am J Pharm Educ. 2008;72(1):11. DOI: 10.5688/aj720111.

23. South Africa. Constitution of the Republic of South Africa Act No. 108 of 1996. Pretoria, South Africa: Government Printer; 1997.

24. South Africa Medical Association Human Rights Law and Ethics Unit. South Africa Medical Association living wills and advance directives. 2012. [cited 20 February 2020]. Available from: https://www.samedical.org/images/attachments/guidelines-with-regard-to-living-wills-2012.pdf.

25. Wheaton A, Parry J. Modified Angoff: Using the Angoff method to set cut scores. 2012. [cited 20 February 2020]. Available from: https://www.coursehero.com/file/23067613/Modified-Angoff/.

26. Eriksson S, Helgesson G, Höglund AT. Being, doing, and knowing: Developing ethical competence in health care. J Acad Ethics. 2007;5:207-16. DOI: 10.1007/s10805-007-9029-5.

27. Pettersson M, Hedström M, Höglund AT. Ethical competence in DNR decisions: A qualitative study of Swedish physicians and nurses working in hematology and oncology care. BMC Med Ethics. 2018;19(1):63. DOI: 10.1186/s12910-018-0300-7.

28. Mullan PB, Weissman DE, Ambuel B, von Gunten C. End-of-life care education in internal medicine residency programs: An interinstitutional study. J Palliat Med. 2002;5(4):487-96. DOI: 10.1089/109662102760269724.

29. Schroder C, Heyland D, Jiang X, Rocker G, Dodek P. Educating medical residents in end-of-life care: Insights from a multicenter survey. J Palliat Med. 2009;12(5):459-70. DOI: 10.1089/jpm.2008.0280.

30. Zhou G, Stoltzfus JC, Houldin AD, Parks SM, Swan BA. Knowledge, attitudes, and practice behaviors of oncology advanced practice nurses regarding advanced care planning for patients with cancer. Oncol Nurs Forum. 2010;37(6):E400-10. DOI: 10.1188/10.Onf.E400-e410.

31. Sharma RK, Szmuilowicz E, Ogunseitan A, Jones SF, Montalvo JA, O'Leary KJ, et al. Evaluation of a mastery learning intervention on hospitalists' code status discussion skills. J Pain Symptom Manage. 2017;53(6):1066-70. DOI: 10.1016/j.jpainsymman.2016.12.341.

32. Tchorz KM, Binder SB, White MT, Lawhorne LW, Bentley DM, Delaney EA, et al. Palliative and end-of-life care training during the surgical clerkship. J Surg Res. 2013;185(1):97-101. DOI: 10.1016/j.jss.2013.05.102.

33. Gigon F, Merlani P, Ricou B. Advance directives and communication skills of prehospital physicians involved in the care of cardiovascular patients. Medicine (Baltimore). 2015;94(49):e2112. DOI: 10.1097/md.0000000000002112.

34. Tulsky JA, Chesney MA, Lo B. How do medical residents discuss resuscitation with patients? J Gen Intern Med. 1995;10(8):436-42. DOI: 10.1007/bf02599915.

35. Minto F, Strickland K. Anticipating emotion: A qualitative study of advance care planning in the community setting. Int J Palliat Nurs. 2011;17(6):278-84. DOI: 10.12968/ijpn.2011.17.6.278.

36. Froggatt K, Vaughan S, Bernard C, Wild D. Advance care planning in care homes for older people: An English perspective. Palliat Med. 2009;23(4):332-8. DOI: 10.1177/0269216309103802.

37. Gigon F, Merlani P, Ricou B. Swiss physicians' perspectives on advance directives in elective cardiovascular surgery. Minerva Anestesiol. 2015;81(10):1061-75.

38. Evans N, Bausewein C, Meñaca A, Andrew EV, Higginson IJ, Harding R, et al. A critical review of advance directives in Germany: Attitudes, use and healthcare professionals' compliance. Patient Educ Couns. 2012;87(3):277-88. DOI: 10.1016/j.pec.2011.10.004.

39. Nankundwa E, Brysiewicz P. Lived experiences of Rwandan ICU nurses caring for patients with a do-not-resuscitate order. Southern African Journal of Critical Care. 2017;33(1):19-22. DOI: 10.7196/SAJCC.2017.v33i1.281.

Section 4: Proposal

Knowledge of anaesthetists in a department of anaesthesiology regarding “do not resuscitate” orders during the perioperative period

Tebogo Benedict Monchwe

0704407M

Supervisor	Juan Scribante Department of Anaesthesiology
Co-supervisor	Helen Perrie Department of Anaesthesiology
Co-supervisor	Blaise Bayingana Department of Anaesthesiology

4.1 Introduction and problem statement

Patients have a constitutional right to make informed decisions regarding their health care. According to the National Patients' Rights Charter (1), "a person may refuse treatment and such refusal shall be verbal or in writing provided that such refusal does not endanger the health of others". This right to consent to or refuse treatment is based on the ethical principle of autonomy. Autonomy or "self-rule" refers to the right of every individual to make their own decisions (2). Section 7 of the National Health Act of South Africa No. 61 of 2003 (3) encourages patients to be informed about the implications, risks and obligations of their decision to refuse hospital treatment.

The Health Professions Council of South Africa (HPCSA) (1) supports the notion of autonomy proposed by the National Patients' Rights Charter (4) and the National Health Act of South Africa No. 61 of 2003 (3) in its guidelines for the withholding and withdrawal of treatment. According to these guidelines, patients must be given the opportunity to indicate their wishes regarding future treatments and to have, in writing, their directives regarding care in possible critical circumstances (1). The guidelines further reiterate the mandate proposed in the National Health Act of South Africa No. 61 of 2003 (3) in allowing the patient to have, in writing, a surrogate decision-maker when they are unable to make health care related decisions for themselves.

Living wills, durable power of attorney and related "do not resuscitate" (DNR) orders all fall under the umbrella term "advanced directives" (5). The aforementioned are all legal instruments through which a patient makes decisions about future life-sustaining treatments, which should be respected and implemented when the patient is no longer mentally competent (6).

DNR orders are a form of passive euthanasia (7) and only apply to withholding and/or withdrawing of cardiopulmonary resuscitation (CPR) (1, 7). DNR orders are written by the treating physician, and the decision for the order may be based on the following: the patient's wishes in an advance directive, informed refusal by a surrogate decision-maker, the futility of CPR, and when the benefits of CPR are outweighed by the burdens and risks (7, 8).

The exact nature of what constitutes futility is not defined, but the American Medical Association (9) has suggested that it is when there is only a 0 — 13% chance of success of treatment. In patients with DNR orders, aggressive medical therapy and appropriate end-of-life care should still be pursued (8, 10) unless the physician deems that continuing aggressive medical care is futile or the patient or their surrogate has a directive indicating their care limitation preference (11-15).

It is estimated that 15% of patients with a living will specifying DNR orders still choose to undergo surgical procedures (16-18). Adherence to DNR orders in the perioperative period has not gained widespread momentum within the medical fraternity (12). One argument explaining this can be divided into two main categories: concerns regarding the validity and reliability of the DNR order itself and difficulties related to the nature of the operating room environment (19). Anaesthesia involves deliberate disruption of cardiopulmonary homeostasis followed by resuscitation, including ventilatory support (19, 20). Thus, resuscitation is the main role of the anaesthetist and does not constitute extraordinary intervention. What could be considered extraordinary may be the use of chest compressions or electrical cardioversion (19). Therefore, requiring anaesthetists not to resuscitate may be fundamentally flawed, and anaesthetists may find it morally distressing to provide care to patients with DNR orders (21).

There is a plethora of literature regarding perioperative DNR orders. However, there is a scarcity of literature assessing the knowledge of anaesthetists regarding DNR orders in the perioperative period. In a self-reported survey in Australia and New Zealand, Keon-Cohen et al (11) reported that 75% of anaesthetists had very low, low or moderate knowledge regarding DNR orders. In a study conducted in Saudi Arabia aimed at assessing perspectives of interns and residents regarding DNR orders, it was shown that there was a lack of familiarity regarding DNR policies, with the residents demonstrating more familiarity with the policies than the interns (22).

There is a paucity of South African literature regarding DNR orders. Anecdotally DNR orders are less commonly used in the public sector than in the private sector. However, anaesthetists work in both the public and private sectors. Also, patient profiles and expectations constantly evolve and DNR orders may be used more

frequently in the future in both the public and private sectors. Therefore, anaesthetists need to be knowledgeable regarding DNR orders. At the University of the Witwatersrand (Wits) the knowledge of anaesthetists regarding DNR orders is not known.

4.2 Aim and objectives

4.2.1 Aim

The aim of this study is to assess the knowledge of anaesthetists regarding DNR orders during the perioperative period in the Department of Anaesthesiology at Wits.

4.2.2 Objectives

The primary objective of this study is to describe anaesthetists' knowledge of DNR orders in the perioperative period.

The secondary objectives of this study are to:

- compare the knowledge of DNR orders in the perioperative period between junior and senior anaesthetists
- compare comfort levels when managing patients with DNR orders in the perioperative period between junior and senior anaesthetists
- describe anaesthetists self-perceived knowledge of the South African ethical and legal framework governing advanced directives.

4.3 Research assumptions

The following definitions will be used in this study.

Anaesthetist: is any qualified doctor working in the Department of Anaesthesiology, including medical officers, registrars and consultants.

Medical officer: is a qualified doctor practising in the Department of Anaesthesiology under specialist supervision. Medical officers with more than 10 years of experience are career medical officers.

Registrar: is a qualified doctor who is registered with the HPCSA as a trainee anaesthesiologist.

Anaesthesiologist: is a qualified doctor who is registered with the HPCSA as a specialist anaesthetist.

Consultant: is an anaesthesiologist or career medical officer.

Junior anaesthetists: include medical officers and registrars in their first three years of training.

Senior anaesthetists: include consultants and registrars with more than three years of training.

Adequate knowledge: in this study adequate knowledge will be determined using the modified Angoff method (23).

South African ethical and legal framework: in this study will include:

- the Constitution of the Republic of South Africa Act No. 108 of 1996 section 27 (24)
- the National Patients' Rights Charter (1)
- the National Health Act of South Africa No. 61 of 2003 (3)
- the HPCSA Guidelines for the Withholding and Withdrawing of Treatment, Booklet 7 (1)
- the South African Medical Association Guidelines on Living Wills and Advance Directives (25)

the World Medical Association Declaration of Venice on Terminal Illness (10).

4.4 Demarcation of study field

The study will be conducted in the Department of Anaesthesiology, affiliated with the Faculty of Health Sciences at Wits. The staff complement of the department is 80 consultants, 10 career medical officer, 110 registrars and 38 medical officers. The department's training platform consists of the following core hospitals.

- Charlotte Maxeke Johannesburg Academic Hospital is a 1200-bed central hospital.
- Chris Hani Baragwanath Academic Hospital is a 2888-bed central hospital.
- Helen Joseph Hospital is a 500-bed tertiary hospital.
- Rahima Moosa Mother and Child Hospital is a 338-bed regional hospital.
- Wits Donald Gordon Medical Centre is a public-private hospital with 190-beds.

4.5 Ethical considerations

Approval to conduct the study will be obtained from the Human Research Ethics Committee (Medical) and the Graduate Studies Committee at Wits. Approval to conduct this study has been obtained from the Head of Department of Anaesthesiology (Appendix A).

Following approval of the study, anaesthetists will be approached at academic meetings. After an explanation of the study, an invitation to participate in the study will be extended to all anaesthetists attending the meeting. All the anaesthetists attending the meeting will be given an information letter (Appendix B) and a questionnaire (Appendix C). The return of the completed questionnaire will imply consent. Upon completion, the questionnaire will be folded by the anaesthetists and inserted into a sealed collection box at the door of the venue. To ensure anonymity and confidentiality, no identifying information will be requested from the participants. The data will be stored securely in a locked cupboard for six years following the completion of the study. Only the researcher and supervisors will have access to the raw data.

However, in light of the current ongoing COVID-19 pandemic, should academic meetings still be held virtually when data collection for this study is due to commence, the study will be conducted via an online platform. An email (Appendix D) will be sent to invite anaesthetists to participate in the study; the email will include a link to completing the questionnaire (Appendix C). The online submission of the questionnaire will imply consent.

Response to the anaesthetist completing the questionnaire through the link will not in any way be linked to email address used for the study invitation or completion of the questionnaire, thereby ensuring anonymity. Data collected through the electronic platform will be housed in the Google Forms database and will be password protected and under the care of the researcher.

The study will be conducted according to the principles of the Declaration of Helsinki (26) and the South African Guidelines for Good Clinical Practice (27).

Should the level of knowledge not be adequate, this will be reported to the Head of Department, and educational interventions will be recommended.

4.6 Research methodology

4.6.1 Research design

A cross-sectional, contextual research study design will be followed.

A cross-sectional study is a type of observational study that examines the relationship between variables at a single point in time (28, 29). In this study, data will be collected from anaesthetists at a single point in time to determine their knowledge regarding DNR orders during the perioperative period.

Contextual studies are studies that are conducted in a specific environment (29). This study will be conducted among anaesthetists in the Department of Anaesthesiology at Wits.

4.6.2 Study population

The study population consists of anaesthetists working in the Department of Anaesthesiology at Wits.

4.6.3 Study sample

Sample size

The sample size will be determined by the response rate. The department consists of 80 consultants, 10 career medical officers, 110 registrars and 38 medical officers. Questionnaires will be distributed to all interested anaesthetists at

academic meetings or sent to all anaesthetists in the department via an online platform. A minimum response rate of 60% (143) of anaesthetists in the department will be considered representative (30).

Sampling method

In this study, a convenience sampling method will be used. Convenience sampling also called “accidental sampling”, is when a researcher includes study participants based on the ease of their availability and accessibility (31). In this study, participants will be approached at academic meetings in the Department of Anaesthesiology or emails will be sent to all anaesthetists.

Inclusion and exclusion criteria

The inclusion criteria for this study are:

- anaesthetists attending the academic meetings
- anaesthetists who give consent.

The exclusion criteria in this study are:

- interns working in the department
- anaesthetists who helped in evaluating and editing the questionnaire
- all questionnaires where only the demographics have been completed.

4.6.4 Data collection

Questionnaire development

Following a review of the national and international literature, a national publication by McQuoid-Mason (7) was identified as appropriate to guide the development of the questionnaire. Permission to use the article to develop a questionnaire was received from the author (Appendix E). The South African ethical and legal framework was used to inform the draft questionnaire.

To ensure content and face validity, the draft questionnaire was reviewed by a senior anaesthesiologist with a postgraduate degree in bioethics, and the suggested changes were incorporated into the final questionnaire (Appendix C).

The questionnaire consists of the following sections:

- Section 1: demographics
- Section 2: a clinical scenario with knowledge questions and a question pertaining to self-perceived knowledge regarding the ethical and legal framework informing DNR orders in South Africa.

Data collection

An invitation to participate in the study will be extended to all the anaesthetists in the Department of Anaesthesiology at Wits, at the departmental academic meetings. Before the commencement of the meeting, the researcher, with permission from the convener, will address the anaesthetists giving a brief explanation of the study. All the anaesthetists attending the meeting will receive an information letter (Appendix B) detailing the study and the self-administered questionnaire (Appendix C). The researcher will be present during the completion of the questionnaire to address any queries that may arise and to prevent data contamination. Upon completion, each participant will be asked to fold their questionnaire in half and place it in a sealed box at the exit of the meeting room, even if it is not complete.

If regulations pertaining to public gatherings have not been eased, anaesthetists will be invited to participate in the study using an online platform. Following approval of the study, all anaesthetists in the Department of Anaesthesiology at Wits will be invited to participate in the study by email. The email will include an information letter (Appendix D or F) and a link to completing the questionnaire (Appendix C). An online submission of the questionnaire will imply consent.

Response to the anaesthetist completing the questionnaire through the link will not in any way be linked to email address used for the study invitation or completion of the questionnaire, thereby ensuring anonymity. Data collected through the electronic platform will be housed in the Google Forms database and will be password protected, and under the care of the researcher and supervisors.

Date	Action
Initial email	An email will be sent to all anaesthetist in the Department of Anaesthesiology at Wits. This email will include an information letter (Appendix D) and a link to the questionnaire (Appendix C).
Approximately 7, 14 and 21 days after initial email	An email reminder will be sent to all anaesthetists in the Department of Anaesthesiology at Wits as it will not be known to the researcher who has or has not completed the questionnaire. The reminder email will include a thank you note to those who may have already completed the questionnaire and a request to complete the questionnaire to those who have not yet done so. This email will include an information letter (Appendix F) and a link to the questionnaire (Appendix C).

Questionnaires will take approximately 15 minutes to complete. Questionnaires returned blank will be excluded from the study and questions not answered will be considered incorrect.

The modified Angoff method (23) will be used to determine adequate knowledge (pass mark). This method uses a panel of at least five experts to review test items and estimate the probability of a minimally qualified performer answering a test item correctly (23). The estimates for each test item is averaged and the averages are used to determine the cut-off score (23). If necessary, this will be done during an online meeting.

4.6.5 Data analysis

A Microsoft Excel® spreadsheet will be used to capture data. Data will be analysed in consultation with a biostatistician using the statistical program STATA version 15 (StataCorp, USA). Categorical variables will be described using numbers and percentages and continuous variables using means and standard deviations or

medians and interquartile ranges depending on the distribution of the data. Comparisons between knowledge scores of junior and senior anaesthetists will be done using either an independent t-test or a Mann-Whitney test. The comparison between level of comfort and also between passing and failing of junior and senior anaesthetists will be done using Chi-square tests or Fisher's exact tests. A p-value of 0.05 or less will be considered statistically significant.

4.7 Significance of the study

Anaesthetists are at times confronted with patients presenting for surgery who have a DNR order in place. It is estimated that 15% of patients with DNR orders still choose to undergo surgical procedures (15-17). The results of this study will give insight into the knowledge of anaesthetists regarding DNR orders in the perioperative period. If the results show poor knowledge, measures can be put in place to improve this knowledge which may contribute to alleviating the uncertainty and moral distress often associated with caring for patients with DNR orders during the perioperative period (21).

4.8 Validity and reliability of the study

Validity refers to "the degree to which a measurement represents a true value" and reliability is the "consistency of the measure achieved" (28).

The validity and reliability of this study will be ensured by:

- using an appropriate study design
- having a representative study sample
- the researcher being present during data collection to answer any queries and to prevent data contamination
- checking every tenth data entry point for accuracy
- analysing data in consultation with a biostatistician.

4.9 Potential limitations

The study is contextual in nature as it will be conducted in the Department of Anaesthesiology at Wits and the findings may not be generalisable to other

departments. Data will be collected from more than one academic meeting, which may lead to data contamination. However, this has not occurred in previous studies conducted in the department.

The use of convenience sampling may result in selection bias, therefore, resulting in a sample that is not representative of anaesthetists in the department of anaesthesiology at Wits.

4.10 Project outline

4.10.1 Time frame

Activity	Jan 2020	Feb 2020	Mar 2020	Jul 2020	Aug 2020	Sep 2020	Oct 2020	Nov 2020	Dec 2021	Jan 2021	Feb 2021
Proposal preparation											
Literature review											
Proposal submission											
Ethics approval											
Postgraduate approval											
Data collection											
Data analysis											
Draft article											
Submission											

4.10.2 Budget

Item	Price per page	Number of pages	Copies	Total
Proposal	R 1	23	10	R 230
Postgraduate form	R 1	2	6	R 12
Information letter	R 1	1	210	R 210
Questionnaire	R 1	6	210	R 1260
Complete report	R 1	150	4	R 600
Grand total				**R 2312**

The Wits Department of Anaesthesiology will incur the costs of paper and printing for the proposal, postgraduate application, information letters and questionnaires. Printing of the information letter and the questionnaire may not be necessary if by the time data collection commences and academic meetings in the department are still being held virtually due to the COVID 19 pandemic, as the invitation to participate in the study will be through an online platform.

4.11 References

1. Health Professions Council of South Africa. Ethical guidelines for good practice in the health care professions. Guidelines for the withholding and withdrawing of treatment. Booklet 7. 2016. [cited 10 February 2020]. Available from: https://www.hpcsa.co.za/Uploads/Professional_Practice/Ethics_Booklet.pdf.

2. Mash B. Handbook of family medicine. 2nd ed. Cape Town, South Africa: Oxford University Press Southern Africa; 2006.

3. South Africa. National Health Act No. 61 of 2003. Pretoria, South Africa: Government Printer; 2004.

4. Department of Health South Africa. The Patients' Rights Charter. Pretoria, South Africa: Government Printer; 2007.

5. Thomas W, Ziel SE, Harris AV. Advance directives in the perioperative setting. AORN J. 1997;66(4):706-8. DOI: 10.1016/s0001-2092(06)62927-x.

6. Jones JW, McCullough LB. Just how far goes DNR? J Vasc Surg. 2008;48(6):1630-2. DOI: 10.1016/j.jvs.2008.08.038.

7. McQuoid-Mason DJ. Emergency medical treatment and 'do not resuscitate' orders: When can they be used? S Afr Med J. 2013;103(4):223-5. DOI: 10.7196/samj.6672.

8. Shapiro ME, Singer EA. Perioperative advance directives: Do not resuscitate in the operating room. Surg Clin North Am. 2019;99(5):859-65. DOI: 10.1016/j.suc.2019.06.006.

9. American Medical Association. Council on ethical and judicial affairs: Guidelines for the appropriate use of do-not-resuscitate orders. JAMA. 1991;265(14):1868-71. DOI: 10.1001/jama.1991.03460140096034.

10. World Medical Association. WMA Declaration of Venice on terminal illness. Adopted by the 35th World Medical Assembly, Venice, Italy, October 1983 and revised by the 57th WMA General Assembly, Pilanesberg, South Africa, October

2006. 2018. [cited 16 February 2020]. Available from: https://www.wma.net/policies-post/wma-declaration-of-venice-on-terminal-illness/.

11. Keon-Cohen Z, Myles PS, Story DA. A survey of Australian and New Zealand anaesthetists' attitudes towards resuscitation orders in the perioperative setting. Anaesth Intensive Care. 2017;45(3):396-402. DOI: 10.1177/0310057x1704500316.

12. Knipe M, Hardman JG. I. Past, present, and future of 'do not attempt resuscitation' orders in the perioperative period. Br J Anaesth. 2013;111(6):861-3. DOI: 10.1093/bja/aet287.

13. Sumrall WD, Mahanna E, Sabharwal V, Marshall T. Do not resuscitate, anesthesia, and perioperative care: A not so clear order. Ochsner J. 2016;16(2):176-9.

14. Nabozny MJ, Steffens NM, Schwarze ML. When do not resuscitate is a nonchoice choice: A teachable moment. JAMA Intern Med. 2015;175(9):1444-5. DOI: 10.1001/jamainternmed.2015.2326.

15. Guarisco KK. Managing do-not-resuscitate orders in the perianesthesia period. J Perianesth Nurs. 2004;19(5):300-7.

16. Association of periOperative Registered Nurses. AORN position statement on perioperative care of patients with do-not-resuscitate or allow-natural death orders. 2020. [cited 17 February 2020]. Available from: https://www.aorn.org/guidelines/clinical-resources/position-statements.

17. Dugan D, Riseman J. Do-not-resuscitate orders in an operating room setting #292. J Palliat Med. 2015;18(7):638-9. DOI: 10.1089/jpm.2015.0163.

18. Margolis JO, McGrath BJ, Kussin PS, Schwinn DA. Do not resuscitate (DNR) orders during surgery: Ethical foundations for institutional policies in the United States. Anesth Analg. 1995;80(4):806-9. DOI: 10.1097/00000539-199504000-00027.

19. Ewanchuk M, Brindley PG. Perioperative do-not-resuscitate orders: Doing 'nothing' when 'something' can be done. Crit Care. 2006;10(4):219. DOI: 10.1186/cc4929.

20. Truog RD. "Do-not-resuscitate" orders during anesthesia and surgery. Anesthesiology. 1991;74(3):606-8. DOI: 10.1097/00000542-199103000-00030.

21. Truog RD, Waisel DB. Do-not-resuscitate orders: From the ward to the operating room; from procedures to goals. Int Anesthesiol Clin. 2001;39(3):53-65. DOI: 10.1097/00004311-200107000-00006.

22. Amoudi AS, Albar MH, Bokhari AM, Yahya SH, Merdad AA. Perspectives of interns and residents toward do-not-resuscitate policies in Saudi Arabia. Adv Med Educ Pract. 2016;7:165-70. DOI: 10.2147/amep.S99441.

23. Wheaton A, Parry J. Modified Angoff: Using the Angoff method to set cut scores. 2012. [cited 20 February 2020]. Available from: https://www.coursehero.com/file/23067613/Modified-Angoff/.

24. South Africa. Constitution of the Republic of South Africa Act No. 108 of 1996. Pretoria, South Africa: Government Printer; 1997.

25. South Africa Medical Association Human Rights Law and Ethics Unit. South Africa Medical Association living wills and advance directives. 2012. [cited 20 February 2020]. Available from: https://www.samedical.org/images/attachments/guidelines-with-regard-to-living-wills-2012.pdf.

26. General Assembly of the World Medical Association. World Medical Association Declaration of Helsinki: Ethical principles for medical research involving human subjects. JAMA. 2013;310(20):2191-4. DOI: 10.1001/jama.2013.281053.

27. Department of Health. South African good clinical practice: Clinical trial guidelines. Pretoria, South Africa. 2019. [cited 21 January 2020]. Available from: https://www.sacraza.com/single-post/2019/07/10/Comments-on-Good-Clinical-Practise-GCP-Clinical-Trial-Guidelines.

28. Botma Y, Greeff M, Mulaudzi M, Wright S. Research in health sciences. Cape Town, South Africa: Pearson Education; 2010.

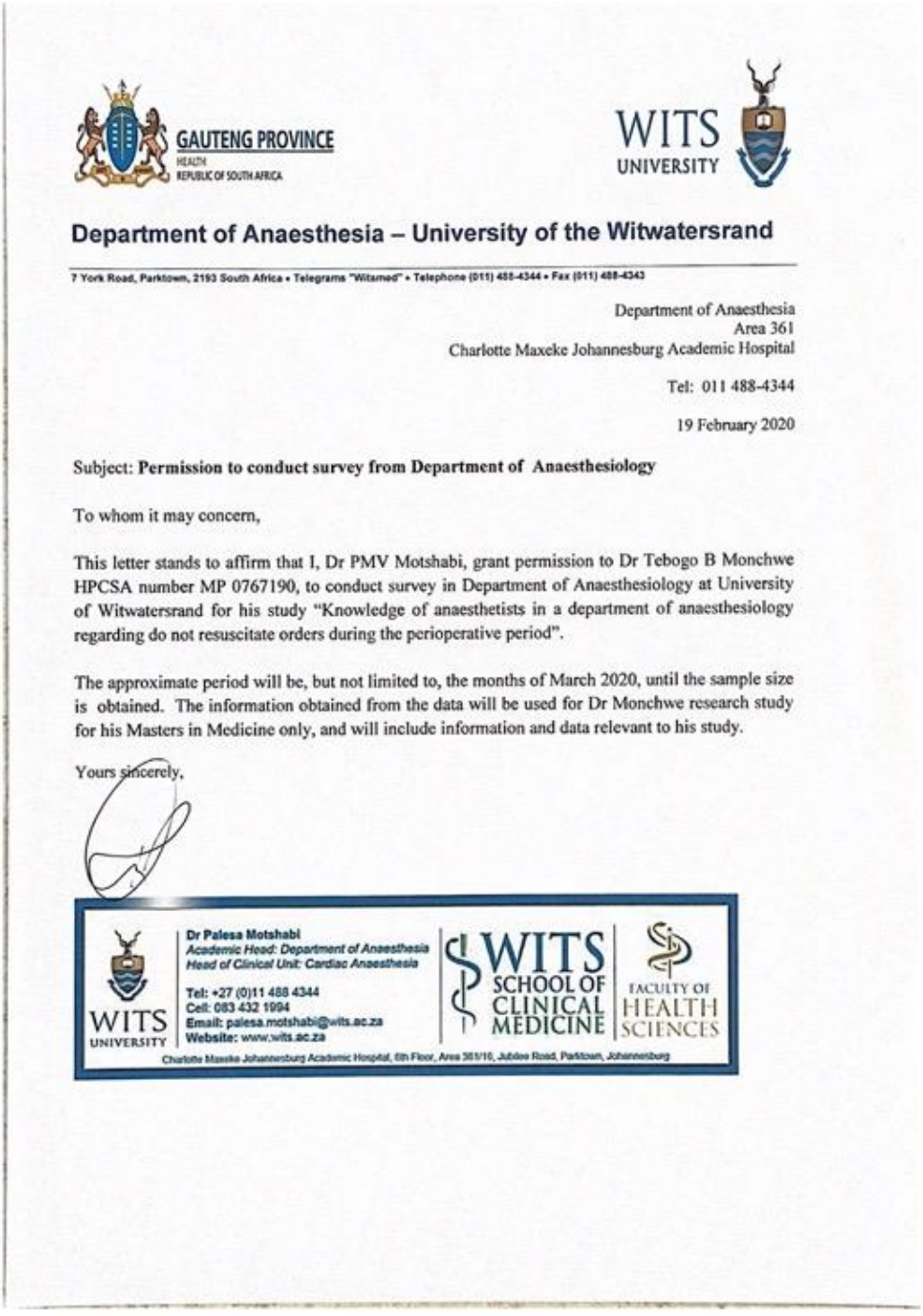
29. Brink H, Van der Walt C, Van Rensburg G. Fundamentals of research methodology for healthcare professionals. 3rd ed. Cape Town, South Africa: Juta and Company Ltd; 2012.

30. Draugalis JR, Coons SJ, Plaza CM. Best practices for survey research reports: A synopsis for authors and reviewers. Am J Pharm Educ. 2008;72(1):11. DOI: 10.5688/aj720111.

31. Burns N, Grove S K. The practice of nursing research: Appraisal, synthesis and generation of evidence. 6th ed. St. Louis, Missouri: Saunders: Elsevier; 2008.

4.12 Appendices

Appendix A: Approval from Head of Department of Anaesthesiology



GAUTENG PROVINCE
HEALTH
REPUBLIC OF SOUTH AFRICA

WITS UNIVERSITY

Department of Anaesthesia – University of the Witwatersrand

7 York Road, Parktown, 2193 South Africa • Telegrams "Witsmed" • Telephone (011) 488-4344 • Fax (011) 488-4343

Department of Anaesthesia
Area 361
Charlotte Maxeke Johannesburg Academic Hospital

Tel: 011 488-4344

19 February 2020

Subject: **Permission to conduct survey from Department of Anaesthesiology**

To whom it may concern,

This letter stands to affirm that I, Dr PMV Motshabi, grant permission to Dr Tebogo B Monchwe HPCSA number MP 0767190, to conduct survey in Department of Anaesthesiology at University of Witwatersrand for his study "Knowledge of anaesthetists in a department of anaesthesiology regarding do not resuscitate orders during the perioperative period".

The approximate period will be, but not limited to, the months of March 2020, until the sample size is obtained. The information obtained from the data will be used for Dr Monchwe research study for his Masters in Medicine only, and will include information and data relevant to his study.

Yours sincerely,

WITS UNIVERSITY

Dr Palesa Motshabi
Academic Head: Department of Anaesthesia
Head of Clinical Unit: Cardiac Anaesthesia

Tel: +27 (0)11 488 4344
Cell: 083 432 1994
Email: palesa.motshabi@wits.ac.za
Website: www.wits.ac.za

WITS SCHOOL OF CLINICAL MEDICINE
FACULTY OF HEALTH SCIENCES

Charlotte Maxeke Johannesburg Academic Hospital, 6th Floor, Area 361/10, Jubilee Road, Parktown, Johannesburg

Appendix B: Information letter

Dear colleague

Hello, my name is Tebogo Benedict Monchwe. I am a registrar in the Department of Anaesthesiology at Wits. I would like to invite you to participate in my research study titled “Knowledge of anaesthetists in a department of anaesthesiology regarding “do not resuscitate” orders during the perioperative period”. This research report will be submitted to the Faculty of Health Sciences to fulfil the requirements for my M Med degree.

Anaesthetists may be confronted by patients with do not resuscitate (DNR) orders presenting for surgery. Management of these patients can be morally, ethically and legally challenging. This study aims to assess the knowledge of anaesthetists regarding DNR orders during the perioperative period.

Participation in the study is voluntary, and there is no penalty for refusal to do so. By completing the questionnaire, consent is implied. Information will be kept anonymous and confidential as none of your personal details will be required. My supervisors and I are the only people who will have access to the raw data. Completion of the questionnaire should take approximately 15 minutes. All questionnaires, complete or incomplete, must be placed in the sealed collection box at the door. Questionnaires, where only the demographics section has been completed, will be excluded from the study. Please do not share information during the completion of the questionnaire to allow an accurate reflection of anaesthetists’ knowledge.

The Human Research Ethics Committee (HREC) (M200321) and the Wits Graduate Studies Committee have approved the study. Should you have any questions, please contact me on 073 686 6662 or the Chairperson of the Human Research Ethics Committee, Prof Clement Penny, on 011 717 2301 or on the email Clement.penny@wits.ac.za. The Committee secretariat, Ms. Z Ndolvu or Mr R Mkansi can be contacted at 011 717 2700 and 011 717 1234 respectively or on the emails Zanele.Ndolvu@wits.ac.za and Rhulani.mkansi@wits.ac.za.

Thank you for taking the time to read this letter.

Yours Sincerely

Tebogo Benedict Monchwe

Appendix C: Questionnaire

Knowledge of anaesthetists in a department of anaesthesiology regarding "do not resuscitate" orders during the perioperative period

Please mark the appropriate box with an X in the space provided

Section 1: Demographics

1. Age in years

20 – 30	
31 – 40	
41 – 50	
> 51	

2. Gender

Male	
Female	

3. Designation

Medical Officer	
1st year registrar	
2nd year registrar	
3rd year registrar	
≥ 4th year registrar	
Consultant	

4. Have you ever received training/teaching on advance directives?
(a)

Yes	
No	

(b) If **YES**, please specify: _____

5. Have you ever treated a patient with a DNR order?
(a)

Yes	
No	

(b) If **YES**, approximately how many patient(s) with a DNR order have you treated?

1 – 3	
4 – 6	
7 – 9	
≥ 10	

6. How comfortable are you treating a patient with a DNR order?

Very uncomfortable	
Somewhat uncomfortable	
Uncomfortable	
Somewhat comfortable	
Comfortable	
Very comfortable	

Section 2: Knowledge questions

Please answer the following questions within the South African ethical and legal framework

Case Scenario

Dr X is an experienced anaesthesiologist in an academic hospital.

A 30-year-old quadriplegic mother of two of sound mind, with an advance directive stating her **DNR order**, presents to Dr X's emergency operating room for a debridement of septic bedsores. She is known to have amyloidosis and bronchiectasis. She is currently receiving culture directed antibiotics for an active lobar pneumonia.

7. Considering her **DNR order**, should Dr X:
   Choose only one option

Advise for her to keep her pre-existing DNR order in place during the perioperative period?	
Automatically suspend her pre-existing DNR order for a specified period of time during the perioperative period?	
Ignore her pre-existing DNR order and continue to deliver a cardio-stable balanced anaesthesia?	
Reconsider her pre-existing DNR order in consultation with her?	

Dr X decides to continue with the anaesthesia for the debridement of the septic bedsores. He induces anaesthesia and secures the airway with an endotracheal tube. During the course of the procedure, the patient develops autonomic dysreflexia with a severe hypertensive crisis. Dr X notices that on her 3-lead ECG, she has developed features consistent with myocardial injury. A 12-lead ECG confirms that she has suffered an anteroseptal ST segment elevation myocardial ischaemia complicated by fast atrial fibrillation, worsening metabolic acidaemia on her arterial blood gas and has delayed emergence from anaesthesia at the conclusion of the procedure.

8. Considering her **DNR order**, should Dr X:
   Choose only one option

On conclusion of the case, discharge the patient to an intensive care unit, where a postoperative bed has been confirmed to be available, for invasive monitoring and further management of the perioperative complications?	
In consultation with the surrogate decision-maker, consider withholding and/or withdrawing life-sustaining treatments and then optimise analgesia, anxiolysis and sedation to ensure she is comfortable and then continue end-of-life care in the appropriate postoperative destination (e.g. secluded post anaesthetic care unit or general ward, where a nurse will be allocated to address her end-of-life care needs or a high dependency care unit) where her loved ones would be allowed to spend time with her in her last hours of life?	
Discharge her to the general ward for continued management?	

9. Dr X decides to take the patient to the intensive care unit for continued resuscitation and further management of the perioperative complications. On day 10, after the index procedure, she is rebooked on Dr X's emergency list for a redebridement. Dr X has opted to do an appropriate regional technique for the patient for this procedure. During the procedure, the patient develops pulseless electrical activity (PEA).

   (a) Should Dr X commence cardiopulmonary resuscitation (CPR) according to ATLS/ACLS principles?

Yes	
No	

   (b) If Dr X decided to commence CPR, should he consider limiting the CPR?

Yes	
No	

   (c) If Dr X decided to commence a limited CPR, which of the following measure(s) should he include as part of the limited CPR?

Mark the ones that should be included with an X.

Shock delivery using a defibrillator if the patient develops a shockable rhythm	
Administration of potent vasoactive substances	
Chest compressions as per ATLS/ACLS principles	
Secure the airway with a definitive airway device with the intent to manage the impending respiratory arrest from the perioperative complication	
Initiate artificial ventilation to deliver intermittent positive pressure ventilation with the intent to manage the impending respiratory arrest from the perioperative complication	
Correction of the 6 H's and 6 T's as per ATLS/ACLS principles	

10. At the conclusion of the second procedure, after successful resuscitation, the patient is transferred back to ICU. A few weeks later, she is declared to be in a persistent vegetative state (PVS). As Dr X is familiar with this patient's history, he is consulted by the intensivist for advice on the management of this patient in a PVS. Considering her **DNR order**, should Dr X recommend commencement of artificial nutrition?

Yes	
No	

11. Dr X and two senior independent clinicians have now assessed this patient to be in a PVS, and it is concluded that continued life-sustaining care for this patient is physiologically, qualitatively and quantitively **futile**.

    (a) Considering her **DNR order**, and in view of the PVS, after consultation with the surrogate decision-maker, should Dr X recommend withholding or withdrawing life-sustaining medical treatment to prevent the prolongation of the dying process by allowing the irreversible chronic underlying medical condition to take its natural course?

Yes	
No	

    (b) If the surrogate decision-maker nominated in writing by this patient in a PVS refuses to consent to Dr X's recommendation of withdrawing and withholding life-sustaining medical therapy. Should Dr X recommend continuing to withdraw and/or withhold life-sustaining medical therapy despite the lack of informed consent from the surrogate decision-maker?

Yes	
No	

12. Are DNR orders lawful when:

	Yes	No
(a) A patient makes an informed decision to refuse CPR?		
(b) A now mentally incompetent patient has an advance directive stating the DNR order?		
(c) The patient's surrogate decision-maker makes an informed decision to refuse CPR?		
(d) The clinical judgement of a medical practitioner concludes that CPR is futile?		
(e) After discussions with the patient and/or their surrogate decision-maker, it is agreed that the burden and risk of CPR outweigh the benefit?		

13. Regarding euthanasia:

	Yes	No
(a) Are DNR orders ethically and legally considered to be a form of euthanasia?		
(b) Is passive euthanasia legal in South Africa?		
(c) Is active euthanasia legal in South Africa?		
(d) Legally is there a difference between passive and active euthanasia?		

14. Knowledge pertaining to the following:

	None	Poor	Average	Good	Excellent
(a) Constitution of the Republic of South Africa Act No. 108 of 1996 section 27					
(b) National Patients' Rights Charter					
(c) National Health Act of South Africa No. 61 of 2003					
(d) Health Professions Council of South Africa, Guidelines for the Withholding and Withdrawing of Treatment, Booklet 7					
(e) South African Medical Association Guidelines on Living Wills and Advance Directives					
(f) World Medical Association Declaration of Venice on Terminal Illness					

Thank you for taking your time to complete this questionnaire

Appendix D: Initial email information letter

Dear colleague

Hello, my name is Tebogo Benedict Monchwe. I am a registrar in the Department of Anaesthesiology at Wits. I would like to invite you to participate in my research study titled “Knowledge of anaesthetists in a department of anaesthesiology regarding “do not resuscitate” orders during the perioperative period”. This research report will be submitted to the Faculty of Health Sciences to fulfil the requirements for my M Med degree.

Anaesthetists may be confronted by patients with do not resuscitate (DNR) orders presenting for surgery. Management of these patients can be morally, ethically and legally challenging. This study aims to assess the knowledge of anaesthetists regarding DNR orders during the perioperative period.

Participation in the study is voluntary and there is no penalty for refusal to do so. By clicking on the link and proceeding to answering the questionnaire and clicking the “Submit” tab consent is implied. Information will be kept anonymous and confidential as none of your personal details will be required. My supervisors and I are the only people who will have access to the raw data. Completion of the questionnaire should take approximately 15 minutes. Questionnaires where only the demographics section has been completed will be excluded from the study.

If you agree to participate in this research study please click on the Google Form link at _____ and follow the research instructions.

The Human Research Ethics Committee (HREC) (M200321) and the Wits Graduate Studies Committee have approved the study. Should you have any questions, please contact me on 073 686 6662 or the Chairperson of the Human Research Ethics Committee, Prof Clement Penny, on 011 717 2301 or on the email Clement.penny@wits.ac.za. The Committee secretariat, Ms. Z Ndolvu or Mr R Mkansi can be contacted at 011 717 2700 and 011 717 1234 respectively or on the emails Zanele.Ndolvu@wits.ac.za and Rhulani.mkansi@wits.ac.za.

Thank you for taking the time to read this letter.

Yours Sincerely

Tebogo Benedict Monchwe

Appendix E: Permission from Author

RE: Permission to use article discussion framework to develop survey questionnaire

2 weeks ago at 23:27

From David Mcquoid-Mason > More

Hi Tebogo

You may certainly use it – just refer to it somewhere in a footnote.

Kind regards

Prof Mason

From: Tebogo Monchwe <t.b.monchwe@icloud.com>
Sent: Tuesday, 11 February 2020 23:47
To: David Mcquoid-Mason <MCQUOIDM@ukzn.ac.za>
Subject: Permission to use article discussion framework to develop survey questionnaire

Good day Prof. McQuoid-Mason
I am a registrar in the Department of Anaesthesiology at the University of Witswatersrand.

I read and took an interest in your article in the South African Medical Journal titled: "Emergency medical treatment and 'do not resuscitate' orders: When can they be used?"
I would like to kindly request permission to use the above mentioned article in developing a questionnaire for my Masters in Medicine thesis. I plan on looking at the anaesthetists knowledge of living wills (advanced directives) in the preoperative period.
I hope this mail finds you well.
Kindest Regards
Dr T.B. Monchwe

Appendix F: Reminder email information letter

Dear colleague

Hello, my name is Tebogo Benedict Monchwe. I am a registrar in the Department of Anaesthesiology at Wits. If you have already participated in this research study by completing the questionnaire I would like to thank you.

If you have not yet participated in this research study, I would like to invite you to participate. My research study is titled “Knowledge of anaesthetists in a department of anaesthesiology regarding “do not resuscitate” orders during the perioperative period”. This research report will be submitted to the Faculty of Health Sciences to fulfil the requirements for my M Med degree.

Anaesthetists may be confronted by patients with do not resuscitate (DNR) orders presenting for surgery. Management of these patients can be morally, ethically and legally challenging. This study aims to assess the knowledge of anaesthetists regarding DNR orders during the perioperative period.

Participation in the study is voluntary and there is no penalty for refusal to do so. By clicking on the link and proceeding to answering the questionnaire and clicking the “Submit” tab consent is implied. Information will be kept anonymous and confidential as none of your personal details will be required. My supervisors and I are the only people who will have access to the raw data. Completion of the questionnaire should take approximately 15 minutes. Questionnaires where only the demographics section has been completed will be excluded from the study.

If you agree to participate in this research study please click on the Google Form link at _____ and follow the research instructions.

The Human Research Ethics Committee (HREC) (M200321) and the Wits Graduate Studies Committee have approved the study. Should you have any questions, please contact me on 073 686 6662 or the Chairperson of the Human Research Ethics Committee, Prof Clement Penny, on 011 717 2301 or on the email Clement.penny@wits.ac.za. The Committee secretariat, Ms. Z Ndolvu or Mr R Mkansi can be contacted at 011 717 2700 and 011 717 1234 respectively or on the emails Zanele.Ndolvu@wits.ac.za and Rhulani.mkansi@wits.ac.za.

Thank you for taking the time to read this letter.

Yours Sincerely

Tebogo Benedict Monchwe

Section 5: Annexures

5.1 Ethics approval

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

R14/49 Dr TB Monchwe

HUMAN RESEARCH ETHICS COMMITTEE (MEDICAL)
CLEARANCE CERTIFICATE NO. M200321

NAME: (Principal Investigator)	Dr TB Monchwe
DEPARTMENT:	School of Clinical Medicine Department of Anaesthesiology Medical School University
PROJECT TITLE:	Knowledge of anaesthetists in a department of anaesthesiology regarding "do not resuscitate" orders during the perioperative period
DATE CONSIDERED:	2020/03/27
DECISION:	Approved unconditionally
CONDITIONS:	
SUPERVISOR:	Dr B Bayingana; Prof J Scribante; Ms H Perrie
APPROVED BY:	Dr CB Penny, Chairperson, HREC (Medical)
DATE OF APPROVAL:	2020/10/15

This clearance certificate is valid for 5 years from the date of approval. Extension may be applied for.

DECLARATION OF INVESTIGATORS

To be completed in duplicate and **ONE COPY** returned to the Research Office Secretary on the 3rd Floor, Phillip Tobias Building, Parktown, University of the Witwatersrand, Johannesburg.
I/we fully understand the conditions under which I am/we are authorized to carry out the above-mentioned research and I/we undertake to ensure compliance with these conditions. Should any departure be contemplated, from the research protocol as approved, I/we undertake to submit details to the Committee. **I agree to submit a yearly progress report**. When a funder requires annual re-certification, the application date will be one year after the date when the study was initially reviewed. In this case, the study was initially reviewed in **March** and will therefore reports and re-certification will be due early in the month of **March** each year. Unreported changes to the application may invalidate the clearance given by the HREC (Medical).

Principal Investigator Signature

20/Oct/2020
Date

5.2 Graduate studies approval

UNIVERSITY OF THE WITWATERSRAND, JOHANNESBURG

Private Bag 3 Wits, 2050
Fax: 027117172119
Tel: 02711 7172076

Reference: Mrs Sandra Benn
E-mail: sandra.benn@wits.ac.za

06 January 2021
Person No: 0704407M
PAG

Dr TB Monchwe
P O Box 4261
2735
South Africa

Dear Dr Tebogo Monchwe

Master of Medicine in Anaesthesia: Approval of Title

We have pleasure in advising that your proposal entitled *Knowledge of anaesthetists in a department of anaesthesiology regarding "do not resuscitate" orders during the perioperative period.* has been approved. Please note that any amendments to this title have to be endorsed by the Faculty's higher degrees committee and formally approved.

Yours sincerely

Mrs Sandra Benn
Faculty Registrar
Faculty of Health Sciences

5.3 Turnitin report



12 July 2021

The Chairperson
Graduate Studies Committee
Faculty of Health Sciences
University of the Witwatersrand

Dear Professor Papathanasopoulos

Re: M Med: **Knowledge of anaesthetists in a department of anaesthesiology regarding "do not resuscitate" orders during the perioperative period**

Dr Tebogo Monchwe, student number: 0704407M, has submitted his research report to Turnitin which revealed a similarity index of 14%. These similarities appear not to be plagiarism but mainly the use of common terminology and phrases specific to the topic of the research.

Yours sincerely,

Juan Scribante
Supervisor

1

0704407m:Research_Report_Tebogo_B_Monchwe_Turnitin.d...

ORIGINALITY REPORT

14%	9%	8%	5%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	samj.org.za Internet Source	3%
2	Submitted to University of Witwatersrand Student Paper	2%
3	Judith O. Margolis. "Do Not Resuscitate (DNR) Orders During Surgery", Anesthesia & Analgesia, 04/1995 Publication	1%
4	ccforum.biomedcentral.com Internet Source	1%
5	docplayer.net Internet Source	1%
6	issuu.com Internet Source	1%
7	Byrne, Susan M., Svetlana Mulcahy, Myra Torres, and Anita Catlin. "Reconsidering Do-Not-Resuscitate Orders in the Perioperative Setting", Journal of PeriAnesthesia Nursing, 2014. Publication	1%