



Ethics as a Non-technical Skill for Surgical Education in Sub-Saharan Africa

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Published online: 2 January 2020
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Abstract

Background In recent years, surgical education has increased its focus on the non-technical skills such as communication and interpersonal relationships while continuing to strive for technical excellence of procedures and patient care. An awareness of the ethical aspects of surgical practice that involve non-technical skills and judgment is of vital concern to surgical educators and encompasses disparate issues ranging from adequate supervision of trainees to surgical care access.

Methods This bibliographical research effort seeks to report on ethical challenges from a sub-Saharan Africa (SSA) perspective as found in the peer-reviewed literature employing African Journals Online, Bioline, and other sources with African information as well as PubMed and PubMed Central. The principles of autonomy, non-maleficence, beneficence, and justice offer a framework for a study of issues including: access to care (socioeconomic issues and distance from health facilities); resource utilization and decision making based on availability and cost of resources, including ICU and terminal extubation; informed consent (both communication about reasonable expectations post-procedure and research participation); research ethics, including local projects and international collaboration; quality and safety including supervision of less experienced professionals; and those religious and cultural issues that may affect any ethical decision making. The religious and cultural environment receives attention because beliefs and traditions affect medical choices ranging from acceptance of procedures, amputations, to end-of-life decisions.

Results and Conclusions Ethics awareness and ethics education should be a vital component of non-technical skills training in surgical education and medical practice in SSA for trainees. Continuing professional development of faculty should include an awareness of ethical issues.

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Introduction

In recent years, surgical education has increased its focus on the non-technical skills such as communication and interpersonal relationships while continuing to strive for technical excellence for procedures and patient care. An awareness of the ethical aspects of surgical practice that involve non-technical skills and judgment is of vital concern to surgical educators and encompasses disparate issues ranging from adequate supervision of trainees to surgical care access. The general ethical principles of autonomy, non-maleficence, beneficence, and justice as outlined by Beauchamp and Childress [1] offer a framework for a study of surgical ethics with an understanding that overlap as in a Venn diagram occurs with ethical issues in the African context (Table 1). Autonomy may include decisions involving the family and community as well as honoring religious beliefs; beneficence requires quality and safe medical care; non-maleficence may involve refusing to provide services outside one's area of expertise; and justice can include access and affordability as well as research that benefits the community in which it takes place as well as the local researchers. Topics of interest include:

- access to care (socioeconomic issues and distance from health facilities);
- resource utilization and decision making based on availability and cost of resources, including ICU and terminal extubation;
- informed consent (both communication about reasonable expectations post-procedure and research participation);
- research ethics, including local projects, international collaboration, authorship;
- quality and safety including supervision of less experienced professionals;
- religious and cultural issues that may affect any ethical decision making.

Methods

This bibliographical research effort was guided by the practical experiences of the three surgeon authors with long-term practices in sub-Saharan Africa (Kenya, Rwanda, Botswana, and Nigeria) and seeks to report on ethical challenges from a sub-Saharan Africa (SSA) perspective as found in the peer-reviewed literature employing African Journals Online (AJOL), Bioline, and other sources with African information as well as PubMed, PubMed Central. Search terms included “Ethics, Surgery, Africa”

and “Ethics and Surgery” combined with African country names.

A brief overview of the cultural and religious environment of SSA provides a backdrop for any discussion of medical ethics because belief systems will influence medical decision making just as they do in the West. The dominant groups in SSA are Christianity (~ 62%) and Islam (~ 30%) with about 3% reporting to be followers of folk or traditional religion [2]. Religious and cultural issues affect many decisions ranging from acceptance of procedures, amputations, and end-of-life decisions [3]. The influence of the traditional beliefs on the followers of Christianity and Islam should never be underestimated. Many researchers who have discussed referral patterns for those who come to allopathic treatment learn that patients have first attempted folk remedies and religious interventions such as prayer houses [4]. “Literature suggests that traditional health practitioners (THPs) play a vital role in the health care of the majority of the South African population and elsewhere on the African continent” [5, 6]. One research team referred to this as “Treatment Blending (TBL), the use by a single participant of more than one of the aforementioned treatment methods for illness” [7].

Autonomy—religion and culture

As the ethics of surgical care and research are examined, the influence of traditional beliefs must always be considered and respected, even in times of disagreement regarding the decisions reached for treatment and procedures. To enter the next world missing a limb may be worse than death. Culture also plays a significant role in decisions; a major tenet of Western medical ethics, patient autonomy, especially that of many African women wherein ultimate decision making belongs to the husband or family, may be diminished when elders or family or community must agree about medical decisions or treatment plans [8]. Even access to care may be influenced by culture and beliefs.

Autonomy—*informed consent*

Informed consent plays an essential role in both clinical practice and research. The ethics surrounding informed consent involve two areas of medical/surgical practice: (1) consent for procedures with an accurate understanding of risks and benefits and realistic view of post-procedure or treatment outcome; and (2) informed consent for inclusion in a research study with full disclosure in understandable language of any possible risk. Informed consent has cultural, social, and even professional implications as well. In clinical practice, studies reveal that not all surgeons obtain informed consent for every operation or procedure. Patients undergo operations without knowing who will operate or

Table 1 Articles demonstrating medical ethics principles and frequent overlap of principles

Ref. no	Author(s)	Article	Autonomy	Beneficence	Non-maleficence	Justice
[63]	Adejumo AO	Socio-cultural factors influencing consent for research in Nigeria: lessons from Pfizer's Trovan clinical trial. <i>Afr J Psychol Study Social Issues</i> . 2008; 11(1&2): 228–237		x	x	x
[3]	Adwok JA, Minelli MJ	End-of-life decisions: ethics, cultural norms, and resource management. <i>Ann Afr Surg</i> . 2012 Jan; 9:12–15	x			x
[14]	Agbemenu K, Volpe EM, Dyer E	Reproductive health decision-making among US-dwelling Somali Bantu refugee women: A qualitative study. <i>J Clin Nurs</i> . 2017 Nov 9. https://doi.org/10.1111/jocn.14162	x			
[13]	Ali AA, Hummeida ME, Elhassan YAM, Nabag WOM, Ahmed MAA, Adam GK	Concept of defensive medicine and litigation among Sudanese doctors working in obstetrics and gynecology. <i>BMC Med Ethics</i> . 2016; 17:12	x			
[51]	Argent AC, Ahrens J, Morrow BM, et al.	Pediatric intensive care in South Africa: an account of making optimum use of limited resources at the Red Cross War Memorial Children's Hospital. <i>Pediatr Crit Care Med</i> . 2014 Jan; 15(1):7–14	x	x	x	x
[44]	Awori M, Ogendo S	The spectrum of paediatric congenital heart disease at the Kenyatta National Hospital: implications for surgical care. <i>Ann Afr Surg</i> . 2013, Jan; 10(1):8–10	x			x
[50]	Beesley SJ, Siika W, Nyale G, Kituyi P, Kussin P	The worldwide end-of-life practice for patients in intensive care units study: adding Africa. <i>Am J Respir Crit Care Med</i> . 2015 Sep 15;192(6):768–769	x	x	x	x
[38]	Bonfrer I, Breebaar LT, Van de Poel E	The effects of Ghana's national health insurance scheme on maternal and infant health care utilization. <i>PLoS One</i> . 2016; 11(11): e0165623		x		x
[42]	Buteera AM	Prevention of perioperative wound infections. <i>East Cent Afr J Surg</i> . 2008 Aug/Sept; 13 (2): 3	x	x		x
[37]	Chomi EN, Mujinja PG, Enemark U, Hansen K, Kiwara AD	Risk distribution across multiple health insurance funds in rural Tanzania. <i>Pan Afr Med J</i> . 2014; 18:350		x		x
[20]	Choo S, Perry H, Hesse AA, et al.	Surgical training and experience of medical officers in Ghana's district hospitals. <i>Acad Med</i> . 2011 Apr;86(4):529–533		x		
[58]	Chu KM, Jayarama S, Kyamanywa P, Ntakiyiruta G	Building research capacity in Africa: equity and global health collaborations. <i>PLoS Medicine</i> . 2014 March;11(3):e1001612		x	x	x
[19]	Ciapponi A, Lewin S, Herrera CA, et al.	Delivery arrangements for health systems in low-income countries: an overview of systematic reviews. <i>Cochrane Database Syst Rev</i> . 2017 Sep 13;9:CD011083		x		
[27]	Dunin De Skrzywno SC, Di Maggio F	Surgical consent in sub-Saharan Africa: a modern challenge for the humanitarian surgeon. <i>Trop Doct</i> . 2018 Jul;48(3):217–220	x		x	x
[54]	Elobu AE, Kintu A, Galukande M, et al.	Evaluating international global health collaborations: perspectives from surgery and anesthesia trainees in Uganda. <i>Surgery</i> . 2014 Apr;155(4):585–92. https://doi.org/10.1016/j.surg.2013.11.007		x		x
[53]	Elobu AE, Kintu A, Galukande M, et al.	Research in surgery and anesthesia: challenges for post-graduate trainees in Uganda. <i>Educ Health (Abingdon)</i> . 2015 Jan-Apr;28(1):11–15. https://doi.org/10.4103/1357-6283.161826		x	x	x

Table 1 continued

Ref. no	Author(s)	Article	Autonomy	Beneficence	Non-maleficence	Justice
[62]	Elsayed DEM, Elamin RM	Documentation of ethical considerations in published articles in Sudanese medical journals. <i>South Afr J Bioethics Law</i> . 2009; 2(1):32–34		x	x	x
[52]	Emanuel EJ, Wendler D, Killen J, Grady C	What makes clinical research in developing countries ethical? The benchmarks of ethical research. <i>J Infect Dis</i> . 2004 Mar 1;189(5):930–937		x	x	x
[12]	Ezeome ER, Chuke PI, Ezeome IV	Contents and readability of currently used surgical/procedure informed consent forms in Nigerian tertiary health institutions. <i>Niger J Clin Pract</i> . 2011 Jul–Sep;14(3):311–317	x	x	x	
[16]	Ganle JK, Obeng B, Segbefia AY, Mwinyuri V, Yeboah JY, Baatiema L	How intra-familial decision-making affects women's access to, and use of maternal healthcare services in Ghana: a qualitative study. <i>BMC Pregnancy Childbirth</i> . 2015; 15: 173	x			
[23]	Gosselin RA, Gyamfi YA, Contini S	Challenges of meeting surgical needs in the developing world. <i>World J Surg</i> . 2011 Feb; 35(2):258–261		x		x
[15]	Gupta ML, Aborigo RA, Adongo PB, et al.	Grandmothers as gatekeepers? The role of grandmothers in influencing health-seeking for mothers and newborns in rural northern Ghana. <i>Glob Public Health</i> . 2015 Oct;10(9):1078–1091	x			
[41]	Hernandez-Villafuerte K, Li R, Hofman KJ	Bibliometric trends of health economic evaluation in Sub-Saharan Africa. <i>Global Health</i> . 2016; 12(1):50	x			x
[56]	International Committee of Medical Journal Editors	Defining the role of authors and contributors. Available at: http://www.icmje.org/recommendations/browse/roles-and-responsibilities/defining-the-role-of-authors-and-contributors.html . Accessed 29 Sept 2019		x	x	x
[46]	Jochberger S, Ismailova F, Lederer W, et al.	Anesthesia and its allied disciplines in the developing world: a nationwide survey of the Republic of Zambia. <i>Anesth Analg</i> . 2008 Mar; 106(3):942–948	x			x
[48]	Joynt GM, Lipman J, Hartog C, et al.	The Durban World Congress Ethics Round Table IV: health care professional end-of-life decision making. <i>J Crit Care</i> . 2015 Apr;30(2):224–230	x	x	x	x
[11]	Kinnersley P, Phillips K, Savage K, et al.	Interventions to promote informed consent for patients undergoing surgical and other invasive healthcare procedures. <i>Cochrane Database Syst Rev</i> . 2013 Jul 6;(7):CD009445	x			
[65]	Klipin M, Mare I, Hazelhurst S, Kramer B	The process of installing REDCap, a web based database supporting biomedical research: the first year. <i>Appl Clin Inform</i> . 2014; 5(4): 916–929				x
[43]	Kolawole IK, Bolaji BO	Reasons for cancellation of elective surgery in Ilorin. <i>Niger J Surg Res</i> . 2002; 4(1):28–33	x			x
[31]	Leet SM, Gai AK, Adek A, Meo G	Can primary health care staff be trained in basic life-saving surgery? <i>South Sudan Med J</i> . 2012; 5(3)				x
[21]	Meara JG, Leather AJ, Hagander L, et al.	Global Surgery 2030: evidence and solutions for achieving health, welfare, and economic development. <i>Lancet</i> . 2015 Aug 8;386(9993):569–624		x		x

Table 1 continued

Ref. no	Author(s)	Article	Autonomy	Beneficence	Non-maleficence	Justice
[61]	Munung NS, Mayosi BM, de Vries J	Equity in international health research collaborations in Africa: Perceptions and expectations of African researchers. <i>PLoS One</i> . 2017; 12(10): e0186237. https://doi.org/10.1371/journal.pone.0186237		x	x	x
[10]	Ochieng J, Buwembo W, Munabi I, et al.	Informed consent in clinical practice: patients' experiences and perspectives following surgery. <i>BMC Res Notes</i> . 2015 Dec 9;8:765	x			
[9]	Ochieng J, Ibingira C, Buwembo W, et al.	Informed consent practices for surgical care at university teaching hospitals: a case in a low resource setting. <i>BMC Med Ethics</i> . 2014 May 19;15:40	x			
[22]	Ojuka D	Skills upgrading for newly qualified surgeon: is the district hospital in Kenya suitable? <i>Ann Afr Surg</i> . 2008; 3:10–14		x	x	
[8]	Osamor PE, Grady C	Women's autonomy in health care decision-making in developing countries: a synthesis of the literature. <i>Int J Womens Health</i> . 2016; 8: 191–202	x			x
[64]	Ossemame EB, Moon TD, Were MC, Heitman E	Ethical issues in the use of SMS messaging in HIV care and treatment in low- and middle-income countries: case examples from Mozambique. <i>J Am Med Inform Assoc</i> . 2018 Apr; 25(4): 423–427		x	x	x
[40]	Ouma PO, Maina J, Thurairara PN, et al.	Access to emergency hospital care provided by the public sector in sub-Saharan Africa in 2015: a geocoded inventory and spatial analysis. <i>Lancet Glob Health</i> . 2018 Mar; 6(3): e342–e350				x
[33]	Pan African Association of Surgeons	Pan African Association of Surgeons. Available at: http://www.africansurgeons.com/ . Accessed 28 September 2019		x		x
[2]	Pew Research Center Religion & Public Life	The future of world religions: population growth projections, 2010–2050: Sub-Saharan Africa, 2016. Available at: www.pewforum.org/2015/04/02/sub-saharan-africa/ . Accessed 28 September 2019				x
[47]	Paruk F, Kissoon N, Hartog CS, et al.	The Durban World Congress Ethics Round Table Conference Report: III. Withdrawing mechanical ventilation—the approach should be individualized. <i>J Crit Care</i> . 2014 Dec;29(6):902–907	x	x	x	X
[59]	Republic of Rwanda Ministry of Health	Guidelines for Researchers Intending to Do Health Research in Rwanda February 2012. Available at: http://www.moh.gov.rw/fileadmin/templates/PHIS/Researchers-Guidelines.pdf . Accessed 28 September 2019		x	x	x
[60]	Republic of Rwanda Ministry of Health	National Health Research Committee (NHRC) Review Checklist, Available at: http://moh.gov.rw/fileadmin/templates/PHIS/NHRC_Checklist_2014.pdf . Accessed 28 September 2019		x	x	x
[32]	Rose J, Weiser TG, Hider P, Wilson L, Gruen R, Bickler SW	Estimated need for surgery worldwide based on prevalence of diseases: implications for public health planning of surgical services. <i>Lancet Glob Health</i> . 2015 Apr 27; 3(Suppl 2): S13–S20		x		x
[30]	Saidi H	Access to specialized surgical care. <i>Ann Afr Surg</i> . 2016;13(1):1–2				x

Table 1 continued

Ref. no	Author(s)	Article	Autonomy	Beneficence	Non-maleficence	Justice
[39]	Scott JW, Raykar NP, Rose JA, et al.	Cured into destitution: catastrophic health expenditure risk among uninsured trauma patients in the United States. <i>Ann Surg.</i> 2018 Jun;267(6):1093–1099				x
[57]	Smith E, Hunt M, Master Z	Authorship ethics in global health research partnerships between researchers from low or middle income countries and high income countries. <i>BMC Med Ethics.</i> 2014; 15: 42. https://doi.org/10.1186/1472-6939-15-42			x	x
[7]	Smith-Cavros E, Avotri-Wuaku J, Wuaku A, Bhullar A	“All I need is help to do well”: herbs, medicines, faith, and syncretism in the negotiation of elder health treatment in rural Ghana. <i>J Relig Health.</i> 2017 Dec;56(6):2129–2143. https://doi.org/10.1007/s10943-017-0378-0	x	x		
[49]	Sprung CL, Truog RD, Curtis JR, et al.	Seeking worldwide professional consensus on the principles of end-of-life care for the critically ill. The Consensus for Worldwide End-of-Life Practice for Patients in Intensive Care Units (WELPICUS) study. <i>Am J Respir Crit Care Med.</i> 2014 Oct 15;190(8):855–66. https://doi.org/10.1164/rccm.201403-0593cc	x		x	x
[26]	Steyn E, Edge J	Ethical considerations in global surgery. <i>Br J Surg.</i> 2019 Jan;106(2):e17–e19		x		x
[28]	Stokstad E	Genetics lab accused of misusing African DNA. <i>Science.</i> 2019;366(6465): 555–556		x		x
[45]	Sviri S, Bayya A, Levin PD, Khalaila R, Stav I, Linton DM	Intelligent ventilation in the intensive care unit. <i>S Afr J Crit Care.</i> 2012;28(1):6–12. https://doi.org/10.7196/sajcc.13	x	x	x	x
[55]	Tarpley M	Letter to the editor: honorary authorships in surgical literature <i>World J Surg.</i> October 2019. Epub before press			x	x
[34]	Tefera G, Turner PL	ACS: Global engagement for the care of the surgical patient. <i>Bull Am Coll Surg.</i> 2018; 103(5):63–66. Available at: https://www.facs.org/~media/files/publications/bulletin/2018/may2018.ashx . Accessed 28 September 2019		x		x
[6]	Tetteh DA, Faulkner SL	Sociocultural factors and breast cancer in sub-Saharan Africa: implications for diagnosis and management. <i>Womens Health (Lond).</i> 2016 Jan; 12(1): 147–156. https://doi.org/10.2217/whe.15.76	x	x		
[29]	The Lancet Commission on Global Surgery	Global Indicator Initiative. Available at: http://www.lancetglobalsurgery.org/indicators . Accessed 28 September 2019				x
[25]	Wall AE	Ethics in global surgery. <i>World J Surg.</i> 2014 Jul;38(7):1574–1580			x	x
[35]	Wall S, Allorto N, Weale R, Kong V, Clarke D	Ethics of burn wound care in a low-middle income country. <i>AMA J Ethics.</i> 2018 Jun 1;20(1):575–580. https://doi.org/10.1001/journalofethics.2018.20.6.msoc1-1806		x		x
[18]	Warwick A, Oppong C, Boateng DB, Kingsnorth A	Inguinal hernia repair is safe in Africa. <i>East Cent Afr J Surg.</i> 2013;18 (2):14–17		x		
[36]	Wysong CS, Paulsen E, Lewin S, et al.	Financial arrangements for health systems in low-income countries: an overview of systematic reviews. <i>Cochrane Database Syst Rev.</i> 2017 Sep 11; (9): CD011084		x		x

Table 1 continued

Ref. no	Author(s)	Article	Autonomy	Beneficence	Non-maleficence	Justice
[17]	Yohannes Y, Mengesha Y, Tewelde Y	Timing, choice and duration of perioperative prophylactic antibiotic use in surgery: A teaching hospital based experience from Eritrea, in 2009. <i>J Eritrean Med Assoc Jema.</i> 2009;4:65–67		x		
[5]	Zuma T, Wight D, Rochat T, Moshabela M	The role of traditional health practitioners in Rural KwaZulu-Natal, South Africa: generic or mode specific? <i>BMC Complement Altern Med.</i> 2016 Aug 22;16(1):304. https://doi.org/10.1186/s12906-016-1293-8	x	x		

the reason for the operation or even what operation will be performed. Patient satisfaction was captured in African settings, but little information was found describing patient understanding of possible outcomes from operation including quality of life [9–11]. A Nigerian study of informed consent forms used in 33 tertiary-care facilities revealed a relatively difficult reading level (13–15 years old), absence of information such as permission for transfusion, tissue disposal, and anesthesia risks, with less than 10% mentioning provision for an interpreter or answering patient’s questions, and only about 11% describing specific risks [12]. Just as the role of the physician in Western healthcare has evolved from the final arbiter of decision making to a collaborating partner with the patient (and perhaps family), the view of collaborative decision making will be seen more frequently in the African context as education increases awareness of this issue. An increase in knowledge of litigation is occurring in the African context as well, so this may also play a role as it has in the West [13]. The physician or researcher seeking informed consent must remember to consider community/family decision making in the African context rather than total autonomy of the patient [14–16].

Beneficence—quality and safety including supervision

Quality and safety should be aimed for in all areas of surgical and medical care. Quality and safety include supervision of less experienced professional trainees and non-surgeons who perform surgical procedures [17–19]. The literature documents that supervision is sometimes occasional for inexperienced trainees in situations where they may be primary surgical providers. A survey of medical officers in Ghana reported that during their training period they were not supervised for a significant number of the reported procedures (7 of 42 Cesarean sections; 5 of 26 exploratory laparotomies; 8 of 23 inguinal herniorrhaphies; and 4 of 18 appendectomies) [20]. Meara

and colleagues in 2015 cited the need for increased supervision of new graduates after formal surgical training as well as for more training and supervision of associate clinicians and general practice physicians who perform operations, anesthesia, or obstetrics [21]. In Kenya, newly trained surgery residents may be posted to district hospitals where they face a number of challenges including lack of supervision in addition to inadequate surgical instruments and low volume of cases. Therefore, a need for improvement is required if the district hospital is to provide a suitable environment for a first posting of newly qualified surgeons [22]. Some countries such as Niger are recognizing the need for regular, if not continuous, supervision of those general practitioners trained to do surgical procedures wherein general surgeons make periodic visits to district hospitals to provide continuing education and supervision [23].

Another ethical issue is the disproportionate burden that women and children bear regarding access to surgery because of lack of safe cesarean sections for obstructed labor and for untreated obstetric fistulas [24].

Justice and non-maleficence—ethics of international collaboration and “global surgery”

The increasing interest in international collaboration and “global surgery” from high-income countries in North America [25], Europe, and Asia adds another component for study. Elmin Steyn and J. Edge in the Division of Surgery, Stellenbosch University in Cape Town, provide a succinct and valuable treatise on the ethical pros and cons of surgical tourism (particularly in trauma), surgical education, and research involving institutions outside SSA [26]. A pertinent report from Burundi involves expatriate surgeons who rely on translators (sometimes their host surgeons) to obtain informed consent for surgical procedures [27]. The commercial use of DNA samples collected in Africa by a research center in the UK has come under criticism in 2019 [28].

Justice—access to care, both socioeconomic and location

Because access to safe and affordable surgery has attracted overdue and appropriate attention following the Lancet Report of 2015 where it is part of three of the six surgical indicators of the state of surgical care [29] as well the release of the *Disease Control Priorities, Third Edition, Essential Surgery* the same year, the ethics of access will be the first area of consideration because, without access, other ethical issues become moot. The lack of health professional human resources in Africa as well as the concentration of health professionals in urban areas is well documented [30–32]. The lack of sufficient surgeons across the continent is being addressed through initiatives of the West African College of Surgeons (WACS), College of Surgeons of East, Central and Southern Africa (COSECSA), Association of Surgeons of South Africa (ASSA), Pan African Association of Surgeons (PAAS) [33], Pan African Academy of Christian Surgeons (PAACS) [34], and other groups dedicated to training surgeons as well as holding high standards for practicing surgeons and providing continuing professional development (CPD). Ethical issues arise when access is complicated by available care that is unaffordable or is scarce as noted for burn care in the Republic of South Africa [35]. The private, for-profit health enterprise is growing but can be expensive. Significant care in SSA has been provided by faith-based medical institutions dedicated to providing services at low cost in underserved and economically challenged areas; but increasingly these hospitals may charge fees too steep for many in the communities. As noted above from the Lancet indicators, grave economic devastation may face families involved in long-term and complex medical care resulting from medical catastrophes such as road traffic injuries, chronic illness, or cancer. African physicians frequently understand medical costs and may factor these into discussions with colleagues as well as treatment options offered to patients. Universal free or low-cost health care, one of the targets of the Sustainable Development Goals (SDGs), is an answer but financing is problematic in low-resource environments [36]. This has been attempted in a number of countries such as Ghana, Tanzania, South Africa, Kenya, and Rwanda through income-based health insurance schemes and other government programs [37, 38].

Access to care includes distance from healthcare facilities as well as financial ability to pay (a problem in the USA [39] as well as Africa). A 2018 study asserted:

We estimated that 287,282,013 (29.0%) people and 64,495,526 (28.2%) women of childbearing age are located more than 2-h travel time from the nearest

hospital. Marked differences were observed within and between countries, ranging from less than 25% of the population within 2-h travel time of a public hospital in South Sudan to more than 90% in Nigeria, Kenya, Cape Verde, Swaziland, South Africa, Burundi, Comoros, São Tomé and Príncipe, and Zanzibar. Only 16 countries reached the international benchmark of more than 80% of their populations living within a 2-h travel time of the nearest hospital [40].

Justice and autonomy—resource utilization including end-of-life decision making

Resource utilization and decision making based on availability and cost of resources, including ICU (if available), are daily concerns of surgeons and other physicians. On a macro-level, some studies seek to understand the economics and resource utilization in the African healthcare sectors [41]. On a micro- or local level, healthcare expenditures and efficiencies are affected by unnecessary operation cancellations, unwillingness to perform terminal extubation, and national formularies that determine resource allocation [2, 42–45]. Terminal extubation and end-of-life decision making are fraught with cultural, ethical, and legal ramifications. Very little data exist about attitudes toward terminal extubation in Africa; for example, 0.2 ICU beds per 100 hospital beds are found in Zambia [46]. At the 2013 Durban Ethics Round Table, participants were asked to respond to the statement, “There is no moral difference between withholding and withdrawing a mechanical ventilator”; of 22 respondents, five were from South Africa (the only African country represented) and four of those five agreed. One salient fact is the lack of specific legal protection in South Africa for withdrawal of support. “Withdrawing of ventilator support is not universal. However, even when withdrawing mechanical ventilation is acceptable, the approach to achieve this end point is highly variable and individualized” [47]. There was majority agreement for many but not all statements describing healthcare professional end-of-life decision making [48]. Only 11 responses, all from South Africa, were in this study for Consensus for Worldwide End-of-Life Practice for Patients in Intensive Care Units (WELPICUS) study [49]. A subsequent article “Adding Africa” was published in 2015. They pointed out the sparse Africa participation and gave a plea for further study in the African context.

Although the definition of appropriate end-of-life care may differ between religions and cultures, and even between fairly similar individuals, the WELPICUS study demonstrates that consensus can be achieved for the

majority of definitions and statements relating to end-of-life practices. Physicians working in limited resource settings and multicultural communities in which critical care and palliative care are relatively young specialties can both contribute significantly to this important discussion and would definitely benefit from being part of this process. We urge critical care and palliative care surgeons and researchers to include colleagues in Kenya, Africa, and around the developing world in future studies so that they are truly “worldwide” [50].

When resources are limited, creating policies that maximize the use of limited resources is a strategy but may still meet objections from both health professions and patients/family [51]. Informed consent becomes a critical factor in any discussion and subsequent decision.

Justice—research ethics, shared authorship, collaboration, informed consent, and use of African literature databases

Research required of surgery trainees for their accreditation as well as all research efforts that involve collaboration with international partners raise ethical issues surrounding equality of sharing credit. Everyone who makes a significant contribution should be an author or at least acknowledged [52–54]. Other factors include seeking ethics board approval before data gathering begins and assuring that collaborators will receive appropriate recognition for their efforts. When collaboration involves international partners, appropriate recognition for all those involved becomes more complex, especially when results are ready for publication [55]. Authorship rules vary widely and some Western groups such as the International Committee of Medical Journal Editors (ICMJE) set such strict guidelines that important contributors could be relegated to acknowledgment rather than authorship if they must meet all four criteria (drafting design, writing or revising, approving, and accountable for accuracy) when, in fact, meeting even one of the criteria likely made the project possible [56].

Evidence-based medicine relies on research done in varying environments. Research into appropriate treatments and procedures in the African context is vital. Using Western-generated protocols may be acceptable in the short term, but studies should be developed that seek answers in the local environment. Employing literature databases such as AJOL and Bioline increases the exposure to African-generated research. Using only predominantly Western-focused databases has some ethical shortcomings. International collaborators must be intentional in including African colleagues in research projects from the planning stages through the completion, data analysis, and final written reports and must offer co-authorship as well as

acknowledgment for contributions [57]. For example, Chu and colleagues, in their study on research collaboration in Africa, point out that in Rwanda, legal as well as ethical guidelines pertain to involving local investigators in research projects and the subsequent authorship for published reports [58]. Rwanda Ministry of Health documents state: “In the event that the PI is foreign, it is important the Rwandan collaborator be a co-PI on any publication, consistent with the guidelines for authorship addressed in the Roles and Responsibilities of Investigators document” [59]. “Does the investigator team have a local Rwandan Investigator(s)? Not applicable if Principal investigator is a Rwandan. All research investigation teams must have a minimum of 30% of Rwandan Investigators” [60]. A perception exists in Africa that international collaborators may be exploiting African researchers and promoting non-sustainable efforts if capacity building is not included in the research efforts [61].

Only one of the vital ethical issues that researchers must consider as they formulate research protocols, informed consent, requires the development of a comprehensible document in the appropriate language of the subjects and the assurance that it is read (or read to a subject unable to read) and signed. In one study of 114 articles published in five peer-reviewed Sudanese medical journals, informed consent was not documented in 69.3% of the articles, and surprisingly, 88.6% of those researchers failed to report approval by an ethics body [62]. Cultural and religious norms must be considered in any project requiring informed consent. For example, “Nigeria is socio-culturally diverse in terms of language, religion, economy, and traditions. Investigators require adequate familiarity with the local socio-cultural characteristics in order to meaningfully communicate the research purpose and method upon which free and informed consent is based” [63].

A recent addition to research effort in SSA is mobile phone usage for collecting and sending research data. How the data are used and other ethical issues are in the early stages of study as reported by Ossemame and colleagues [64]. Also, online data collection and storage methods such as REDCap (which may be institution-based in the West as well as in Africa) [65] focus attention on the issue of data ownership and how data are used. Assuring research participants of privacy and confidentiality is a hallmark of ethical study design.

Results and conclusion

After reviewing the literature concerning ethical topics in surgical and medical practice in SSA in light of the practical experience of the three surgeon authors, the ethical issues arising from the practice of surgery with the

intention to address the challenges should be a vital component of training in SSA and elsewhere. Potential ethics curriculum topics based on principles of autonomy, beneficence, non-maleficence, and justice include: informed consent and patient comprehension; confidentiality and protecting patient data; end-of-life decision making; access to appropriately trained medical professionals; resource utilization; and research ethics. Leadership and advocacy are required to implement additions to training curriculum; therefore, the issues raised should be added to the continuing professional development of practicing surgeons, academic faculty, and other health professionals. As the various surgical societies and associations seek to raise standards, improve safety and quality, and create more uniform curricula for trainees across the continent, surgical ethics should be a core subject.

Funding None.

Compliance with ethical standards

Conflict of interest We have no conflicts of interest to disclose.

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