

Critical Appraisal of the Curricula of MD Anesthesiology Programs in Nepal using Harden's 10 Questions

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ABSTRACT

Introduction

Anesthesiology in Nepal is evolving beyond its traditional operating room role, increasingly encompassing critical care, pain management, and multidisciplinary support. As surgical and procedural services expand, there is a growing demand for anesthesiologists with advanced clinical, leadership, and research skills. Ensuring that MD Anesthesiology curricula are robust and contextually relevant is essential for meeting Nepal's diverse healthcare needs. This study aimed to assess whether the curricula included the key principles as outlined in Harden's 10-question framework.

Methods

This study critically evaluated the MD Anesthesiology curricula from major Nepalese institutions using Harden's Ten Questions framework. Curricular documents were collected and analyzed independently by multiple reviewers.

Results

All programs follow a three-year structure with a mandatory thesis, but variability exists in curricular detail, organization, and emphasis on research or community-based components. Needs assessments and stakeholder engagement are generally absent. Educational objectives are broad but often lack focus on leadership and interprofessional skills. Teaching and assessment methods remain largely traditional, with limited use of active learning or competency-based approaches. Communication of curriculum details and educational environment standards also vary widely.

Conclusion

MD Anesthesiology curricula in Nepal require comprehensive reform. Implementing evidence-based needs assessments, modern educational strategies, and continuous quality improvement will better prepare graduates to meet the complex challenges of contemporary healthcare.

Keywords

Anesthesiology, curriculum evaluation, Harden's ten questions, medical education

INTRODUCTION

Anesthesiology has evolved into a highly specialized field integral to modern healthcare systems extending beyond the operating room to roles in critical care, acute and chronic pain management, and support for diagnostic and therapeutic procedures.^{1,2} The increasing complexity of surgical care, the rise of interventional radiology and endoscopic procedures, and the growing burden of non-communicable diseases have amplified the demand of anesthesiologists not only skilled clinically but also in leadership, communication, and research.^{3,4} MD Anesthesiology programs offered by various Nepalese universities aim to address this by producing qualified anesthesiologists meeting both local and global standards. However, their success depends on comprehensive, contextually relevant curricula responsive to evolving healthcare challenges.

Curriculum design has shifted from teacher-centered, content-heavy models to more student-centered, outcome-based approaches.⁵ Harden's Ten Questions framework provides a systematic method for curriculum development and evaluation.⁶ This paper uses Harden's framework to evaluate the current MD Anesthesiology curricula in Nepal with an objective to assess whether the curriculum included the key principles of curriculum development that would also identify strengths, gaps, and opportunities for improvement in anesthesiology training delivery across various institutions.

With the increasing emphasis on competency-based medical education (CBME) and global standards such as the CanMEDS framework, this evaluation also provides a timely lens to align Nepal's programs with international best practices.⁷ The findings aim to guide educators, policymakers, and academic leaders in reforming postgraduate anesthesia education, thereby better preparing future anesthesiologists for the complex demands of healthcare delivery.

METHODS

Study Design

This study utilized a descriptive qualitative design to critically evaluate the Master of Medicine (MD) in Anesthesiology curricula across various institutions in Nepal. The evaluation was structured around Harden's 10 Questions framework, which provides a comprehensive approach to curriculum assessment by addressing key areas such as educational objectives, content relevance, teaching methodologies, and assessment strategies. The aim was to assess whether the curriculum included the key principles as outlined in Harden's 10-question framework.

Curriculum Selection and Data Collection

The list of institutions offering MD Anesthesiology programs in Nepal was prepared taking reference from the Medical Education Commission (MEC), the regulatory agency in Nepal. The curricula from the identified institutions, their academic calendars, if available, class schedules, clinical rotation plans, and examination schedules were collected.

Framework for Curriculum Evaluation

The evaluation of the MD Anesthesiology curricula was carried out using Harden's 10 Questions framework. This framework addresses 10 critical aspects of curriculum design (Table 1).

Each institution's curriculum was reviewed independently by multiple authors to ensure accuracy and minimize bias. The data extracted was systematically analyzed.

Table 1. Harden's 10 questions of curriculum development framework

Questions	
1.	What are the needs in relation to the product of the training program?
2.	What are the aims and objectives?
3.	What content should be included?
4.	How should the content be organised?
5.	What educational strategies should be adopted?
6.	What teaching methods should be used?
7.	How should assessment be carried out?
8.	How should details of the curriculum be communicated?
9.	What educational environment or climate should be fostered?
10.	How should the process be managed?

Consensus Building and Recommendations

After the initial analysis, the authors convened to discuss and reach a consensus on the evaluation findings. The goal was to ensure that the recommendations would be practical, evidence-based, and contextually relevant for improving the MD Anesthesiology curricula in Nepal. The findings were then used to generate a set of actionable recommendations that could guide curriculum reforms in line with modern medical education principles and the specific needs of Nepal's healthcare system.

RESULTS

MD Anesthesiology programs in Nepal

The MD Anesthesiology degree is offered by two universities, and five academies, namely Tribhuvan University (TU), Kathmandu University (KU), BP Koirala Institute of Health Sciences (BPKIHS), Patan Academy of Health Sciences (PAHS), Karnali Academy of Health Sciences (KAHS), Pokhara Academy of Health Sciences (PoAHS), National Academy of Medical Sciences (NAMS) and Fellowship of National Board of Medical Specialties (FNBMS) in Anesthesiology.

TU and KU operate both central campuses and affiliated medical colleges across the country.^{8,9} The National Board of Medical Specialties under the umbrella of the Medical Education Council also operates the masters level program across various specialty hospitals across the country under the name Fellowship of National Board of Medical Specialties (FNBMS) Anesthesiology.¹⁰ The remaining institutions conduct their programs exclusively within their own teaching hospitals. While all programs conform to the Medical Education Commission's three-year structure and thesis requirement, notable variations exist in their curricular detail, implementation, and emphasis on community or research-based components.

DISCUSSION

The key observations from the reviewed curriculum are: 1. All the programs follow a 3-year structure with a mandatory thesis, 2. TU and KU emphasize community postings, 3. Research components lack standardization across institutions. When viewed through Harden's Ten Questions framework, the comparative analysis of MD Anesthesiology curricula across Nepalese institutions reveals both commendable progress and significant areas in need of development. As highlighted in the introduction, the evolving role of anesthesiologists in critical care, procedural medicine, and interdisciplinary teams necessitates a forward-looking, competency-based, and contextually grounded educational framework. The findings of this appraisal suggest that while foundational elements are in place, several components of curriculum design and implementation require deliberate enhancement.

Needs Assessment and Stakeholder Involvement

One of the most striking gaps across all institutions is the absence of a formal needs assessment process that considers the healthcare realities of Nepal. None of the curricula explicitly document engagement with key stakeholders such as clinicians, educators, policy-makers, patients, or communities. This oversight risks producing graduates who may be clinically competent but not optimally prepared to address the specific needs

Table 2. Comparative chart of existing Curricula for the MD Anesthesiology programs in Nepal

Harden's 10 questions	TU (2014)	KU	KAHS (2018)	PAHS (2021)	PoAHS	BPKIHS (1998)	NAMS (2008)	FNBMS	Authors' Comments/ Recommendations
1. Needs assessment in relation to the product:	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Conduct surveys and focused group discussions Identify research gaps Describe the future prospect of service providers, educators, and researchers. How will they be suited in the community?
• What are the needs of the community?	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	
• Do you need teachers?	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	
• Do you need researchers?	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	
• Views of the stakeholders included?	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated	Not explicitly stated

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Table 2. Comparative chart of existing Curricula for the MD Anesthesiology programs in Nepal (contd.)

Harden's 10 questions	TU (2014)	KU	KAHS (2018)	PAHS (2021)	PoAHS	BPKIHS (1998)	NAAMS (2008)	FNBMS	Authors' Comments/ Recommendations
2. Aims and objectives	To produce service providers, educators, and researchers	Not explicitly stated	Not explicitly stated	Produce service providers, educators and researchers	Not explicitly stated	Develop competent anesthesiologist and intensivist, Provide quality health service, Conduct scientific bio-medical research	Not explicitly stated	Fulfill the gap in trained anesthesiologists in Nepal, who are competent, willing to work throughout the country, morally valued, and show leadership qualities.	Comprehensive, proficient anaesthesia service provider Critical thinker Educator Researcher Life-long learner Leadership skills
3. Content	Well described; Detailed list of topics to be read is given Additionally, content of the recent advances included Research methods, CPR, and communication skills training and This is mandatory. A section on professional skills described as supportive curriculum that includes statistics and research methods, Critical appraisal of literature, ethics, legal issues, continuous quality improvement, Teaching and communication skills, and professional structure	Well described Detailed list of topics to be read is given Lacks topics on the recent advances in the field	Well described Detailed list of topics to be read is given Topics on recent advances including POCUS listed Additionally emphasis is given on professional trainings including research methodology, basic surgical skill course, basic and advanced cardiac life support, primary trauma care, infection control and palliative care	Well described Detailed list of topics to be read is given Lacks topics on the recent advances in the field	Well described Detailed list of topics to be read is given Lacks topics on the recent advances in the field	Well described Detailed list of topics to be read is given Additionally gives details of topics on medical education, interpersonal skills, medical ethics and legal responsibility, research methods, clinical epidemiology and computer training. Lacks topics on the recent advances in the field	Well described. Detailed list of topics to be read is given. Lacks topics on the recent advances in the field Mandatory Research methodology, Medical education, Advanced cardiac life support and Trauma life support training.	Well detailed list of topics. Emphasis on theoretical and clinical learning Posting schedule suggested Procedural competencies defined	Standardize topic lists across institutions while allowing specialization flexibility.
4. Organization of the content	Year wise into: Basic science, Clinical, and research that includes specialty postings, thesis writing, and practice under supervision	Year wise	Year wise	Year wise	Year wise	Year wise	Year wise	Semesterwise (6 semesters)	Adopt a semester system for better integration of theory and practice.
5. Educational strategies	Not explicitly stated but supervised clinical practice and thesis writing, General anesthesia and specialty rotation, One month of community hospital posting	Not clear	Self-directed learning	Not clear	Not clear	Learning by doing	Self-directed learning/ Learning while working	Not clear	SPICES model: S: Student centred P: Problem based I: Integrated C: Community based E: Elective S: Systematic

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Table 2. Comparative chart of existing Curricula for the MD Anesthesiology programs in Nepal (contd.)

Harden's 10 questions	TU (2014)	KU	KAHS (2018)	PAHS (2021)	POAHS	BPKIHS (1998)	NAMS (2008)	FNBMS	Authors' Comments/ Recommendations
6. Teaching methods	Clinical mentoring/ hands on training	Not clear	Not clear	Clinical mentoring, Hands on training to acquire core skills	Not clear	Demonstration Role play Lectures kept bare minimal Critical review of literature Seminar Journal Club Case based learning Audit Microteaching Integrated seminars Small group tutorials	Tutorials Seminars Journal club Case presentation	Theoretical – lectures, Clinical presentations, seminar, journal clubs, morbidity and mortality review, case discussions, interdepartmental discussions, workshops, conferences, small group discussion, self directed learnings	KSA/ CBME Skill labs, Simulations
7. Assessment method	Formative and Summative	Formative and Summative	Formative and Summative	Formative (content and process evaluation) and Summative Clinical examination DOPS (directly observed procedural skills), Case Based Discussion, Procedure Based Assessment, Field notes, log books, Core competency rating form	Formative and Summative	Continuous assessment (end-posting, end module, end-unit) No end course written examination. Assignments. Clinical case + OSCE + Viva	Formative and Summative Thesis End-of-rotation evaluation Clinical case + OSCE + Viva	As per NBMS rules	Add diagnostic evaluation Follow CBME format
8. Communication strategy	Rotation schedule for clinical posting Class/seminar schedules Typical daily schedule	Rotation schedule for clinical posting Class/seminar schedules Typical daily schedule	Rotation schedule for clinical posting Class/seminar schedules Typical daily schedule	Rotation schedule for clinical posting Class/seminar schedules Typical daily schedule	Rotation schedule for clinical posting Class/seminar schedules Typical daily schedule	Rotation schedule for clinical posting Class/seminar schedules Typical daily schedule	Rotation schedule for clinical posting Class/seminar schedules Typical daily schedule	Semesterwise clinical posting schedule	Integrate Prepare an academic calendar Publish daily schedules for transparency
9. Educational environment	Not clear	Not clear	Not clear	Not clear	Not clear	Computer room with computers and printing facilities Internet and MEDLINE facilities Library	Not clear	Not clear	Classroom location, size, lights, cooling Audio-visual aids Staff support zone Standardize infrastructure requirements (simulation labs, ICU exposure etc)
10. Process management	Subject committee Faculty board Academic council CDC	Not clear	Not clear	Not clear	Not clear	Not clear	Not clear	Not clear	Continuous process Establish dedicated curriculum development cells with stakeholder representation

of Nepal's diverse population, including rural areas with limited access to anesthesia services. As emphasized in the introduction, aligning curricula with national healthcare priorities and workforce demands is essential. Institutions are encouraged to conduct systematic needs assessments through stakeholder consultations, workforce analysis, and epidemiological data to ensure curricular relevance and social accountability.

Educational Objectives and Competency Alignment

All programs aim to produce clinicians, educators, and researchers. However, few expand these aims to include broader professional roles such as leadership, advocacy, lifelong learning, and interprofessional collaboration—elements that are increasingly recognized as core to anesthesia practice globally. As Nepal moves toward a more sophisticated healthcare delivery model, curricula must reflect a competency-based approach that includes not only technical skills but also communication, ethics, teamwork, and systems-based practice. Incorporating frameworks such as Canadian Medical Education Directives for Specialists (CanMEDS) or Accreditation Council for Graduate Medical Education (ACGME) core competencies would provide a structured pathway to achieve these goals.^{7,11}

Content and Curriculum Organization

Although core anesthesia topics are addressed in all programs, there is variation in depth, structure, and presentation across institutions. As underscored in the introduction, a more integrated and systematic approach to content organization is needed. Adopting a semester-based system could facilitate horizontal and vertical integration of basic sciences, clinical training, and research exposure^{12,13}; however this needs further exploration before adoption in MD Anesthesiology program. Furthermore, standardizing essential content areas while allowing room for elective specialization (e.g., cardiac anesthesia, regional techniques, critical care, and pain management) would improve both relevance and flexibility.

Educational Strategies and Teaching Methods

Another major area for improvement is the lack of clearly defined educational strategies. Modern medical education promotes student-centered, problem-based, and community-engaged learning. However, none of the curricula explicitly reference such strategies, nor do they appear to incorporate active learning methods such as simulations, case-based learning, or flipped classrooms. The adoption of the SPICES model would help institutions shift from traditional, passive instruction to methods that promote critical thinking, clinical reasoning, and lifelong learning. Introducing skill labs, simulation

centers, and structured mentorship programs would also bridge the gap between theory and practice, especially in critical care and emergency settings.¹⁴

Assessment Methods

While all institutions employ formative and summative assessments, there is little innovation or diversity in assessment tools. Introducing diagnostic assessments, Objective Structured Clinical Examinations (OSCEs), workplace-based assessments (e.g., Mini-CEX, DOPS), and portfolio-based evaluations would provide a more comprehensive view of learner development. Alignment with competency-based medical education (CBME) requires that assessments be not only frequent and formative but also directly linked to the expected outcomes.

Communication of Curriculum and Educational Environment

Transparency in curriculum communication is variable. TU and KU provide detailed schedules, while other institutions are less consistent. Clear, structured, and accessible curriculum documentation improves student engagement and accountability. Similarly, the physical and psychosocial learning environment is rarely addressed. High-quality infrastructures such as simulation labs, well-equipped classrooms, and supportive faculty-student relationships play a critical role in learning effectiveness. Minimum infrastructure standards and regular feedback mechanisms should be institutionalized to enhance the educational climate.

Curriculum Governance and Continuous Improvement

Process management structures such as subject committees and curriculum development committees exist in some institutions, but there is limited evidence of regular review or stakeholder participation. Continuous curriculum improvement requires dedicated curriculum development cells with representation from faculty, students, alumni, employers, and external experts. Incorporating regular feedback loops, external audits, and alignment with national and global medical education standards will ensure sustained relevance and quality.

Limitations

While this study provides valuable insights into the current state of MD Anesthesiology curricula in Nepal, it is limited by the absence of direct feedback from students, faculty members, and other stakeholders. Implementation of the curricular framework might have been different at the individual institute level. Future research could include surveys and interviews with stakeholders to gather additional perspectives on the effectiveness of these curricula.

CONCLUSION

The MD Anesthesiology curricula across Nepalese institutions share a foundational structure but exhibit gaps in needs assessment, educational strategies, and process management. Addressing these gaps through conduct of comprehensive, evidence-based needs assessment involving key stakeholders, adoption of modern educational frameworks like SPICES and CBME, enhanced assessment methods, improved communication and infrastructure, and educational environment will strengthen the training of anesthesiologists. Moreover, institutionalizing continuous curriculum development and evaluation will further strengthen the training programs. Ultimately, these improvements will better prepare graduates to serve Nepal's diverse healthcare needs as competent clinicians, educators, and researchers.

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CONFLICT OF INTEREST

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AUTHOR CONTRIBUTIONS

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REFERENCES

1. American Society of Anesthesiologists. The anesthesiologist's role in the medical team [Internet]. Schaumburg (IL): American Society of Anesthesiologists; [cited 2025 May 8]. Available from: <https://www.asahq.org/education-and-career/asa-medical-student-component/the-anesthesiologists-role-in-the-medical-team>
2. Verma R, Mohan B, Attri JP, et al. Anesthesiologist: the silent force behind the scene. *Anesth Essays Res.* 2015;9(3):293-297. doi:10.4103/0259-1162.159775
3. Kaur S, Gupta A, Pathak A, et al. Interventional radiology procedures and anesthesia practices: a bibliometric analysis. *Cureus.* 2024;16(2):e54567. doi:10.7759/cureus.54567
4. Repici A, Hassan C. The endoscopist, the anesthesiologists, and safety in GI endoscopy. *Gastrointest Endosc.* 2017;85(1):109-111. doi:10.1016/j.gie.2016.06.025
5. Naithani N, Vasudevan B. Paradigm shift in medical education: the future beckons. *Med J Armed Forces India.* 2021;77(Suppl 1):S1-S3. doi:10.1016/j.mjafi.2021.01.021
6. Harden RM. Ten questions to ask when planning a course or curriculum. *Med Educ.* 1986;20(4):356-365. doi:10.1111/j.1365-2923.1986.tb01379.x
7. Royal College of Physicians and Surgeons of Canada. CanMEDS framework [Internet]. Ottawa (ON): Royal College of Physicians and Surgeons of Canada; [cited 2025 May 8]. Available from: <https://www.royalcollege.ca/en/standards-and-accreditation/canmeds.html>
8. Institute of Medicine. Post-graduate programs [Internet]. Kathmandu: Institute of Medicine; [cited 2025 May 10]. Available from: <https://iom.edu.np/pgprograms/>
9. Kathmandu University School of Medical Sciences. MD/MS – KUSMS [Internet]. Dhulikhel: KUSMS; [cited 2025 May 10]. Available from: <https://kusms.edu.np/md-ms/>
10. Medical Education Commission. Standards and accreditation [Internet]. Kathmandu: MEC; [cited 2025 May 10]. Available from: <https://www.mec.gov.np/en/directorate/4>
11. Accreditation Council for Graduate Medical Education. ACGME home [Internet]. Chicago (IL): ACGME; [cited 2025 May 8]. Available from: <https://www.acgme.org/>
12. Brauer DG, Ferguson KJ. The integrated curriculum in medical education: AMEE Guide No. 96. *Med Teach.* 2015;37(4):312-322. doi:10.3109/0142159x.2014.970998
13. Quintero GA, Vergel J, Arredondo M, et al. Integrated medical curriculum: advantages and disadvantages. *J Med Educ Curric Dev.* 2016;3:JMECD.S18920. doi:10.4137/JMECD.S18920
14. Dent JA. The continuing use of the SPICES model in 'SAVOURING' curriculum development. *Med Teach.* 2023;45(7):760-765. doi:10.1080/0142159X.2022.2158067