INTERNATIONAL DENTISTRY – AFRICAN EDITION: ETHICS 2026

Please note: More than one answer may be applicable

QUESTIONNAIRE 1

State of the AI-enhanced Technology in Dentistry – Ethical, Regulatory and Practical Challenges

Johan Hartshorne

1. **The key factors driving the AI technology transformation in dentistry are:**
a. The necessity to stay competitive and relevant.
b. To enhance efficiency and productivity.
c. Improve overall practice resilience.
d. To improve service delivery, accessibility, and enhancing quality of life.
e. All of the above.

2. **Current trends indicate a significant advancement towards integrating cutting-edge AI-enhanced technologies into dental practice, with a fundamental shift towards which of the following key focus areas?**
a. Efficient workflow.
b. Decreasing practice overheads.
c. Increasing practice profitability.
d. Enhanced diagnostic accuracy.
e. Patient-centered care.

3. **Which of the following advancements in AI-enhanced technologies are currently reshaping modern dental practices?**
a. Digital diagnostic imaging.
b. 3D Printing and Multifunctional Anatomical Prototypes.
c. Digital dental, face scanning and morphometric analysis.
d. Intra-oral ultrasonography and biosensors.
e. All of above.

4. **Which of the following statements relating to core ethical principles relevant to AI applications in dentistry are TRUE?**
a. Should provide meaningful, understandable, and context appropriate information.
b. Algorithm bias ensures inclusive access to the benefits of AI technologies and the elimination of unfair discrimination.
c. Should never cause foreseeable or unintentional harm.
d. Dentists are not responsible and accountable for decisions and harm caused by AI-systems.
e. AI-systems should respect individual privacy both in the use of personal data and decisions made therefrom.

5. **Without robust ethical and regulatory frameworks, safeguarding patient autonomy, ensuring data privacy, addressing biased AI decisions, risk of diagnostic errors, and maintaining professional accountability and patient data vulnerabilities remain a significant concern. TRUE or FALSE?**
a TRUE b. FALSE

6. **Which of the following statements relating to regulatory challenges are TRUE?**
a. Currently there is no ethical or regulatory framework for innovation and adoption of AI-enhanced technologies and software in South Africa.
b. There is growing pressure to align with global standards and ethical principles for AI governance.
c. There is no need for human oversight and formal profession-wide standards as the autonomy of AI-systems increases.
d. Robust data protection measures, including safeguarding against unauthorized access, are essential due to AI's reliance on sensitive patient data like medical records and diagnostic images.
e. Current 'medical device' regulations in South Africa do not include software in the definition of a medical device.

7. **Core regulatory trends shaping global AI-governance include:**
a. Healthcare falls under a low-risk category with no obligations.
b. Developers, deployers, distributors and providers each carry distinct duties and accountability across the AI-lifecycle.
c. Pre-deployment assessment documentation, conformity assessments, post-market monitoring, and incident monitoring are treated as proof that governance exists in practice.
d. South Africa has a dedicated regulatory framework and institutional capacity tailored for AI-specific risks such as accountability in decision- making, data protection and algorithmic bias.

8. **Key enabling factors driving the adoption of AI-enhanced technologies in dentistry include:**
a. Higher diagnostic accuracy.
b. Less patient-clinician communication required.
c. Improved workflow efficiency resulting in greater productivity.
d. Optimization of diagnosis and treatment planning protocols.
e. o generate automated personalized reports, thereby saving time and reducing workload.

9. **Which of the following statements relating to the adoption and implementation of AI-enhanced technologies by dental practitioners are TRUE?**
a. Low cost of AI-technology makes it practical for use in low-resource dental settings.
b. Integrating new AI-technologies and their software seamlessly into existing standardized workflows without disrupting existing hardware or software, is challenging.
c. AI-enhanced technologies do not require maintenance and upgrade support.
d. Professional training and skills development remain a barrier to integration AI into routine dental practice.
e. Cloud-based AI systems increase the risk of unauthorised access and data breaches, potentially exposing sensitive patient information to cyber-attacks.

10. **Future directions of AI in dentistry will likely focus on:**
a. Less automated care.
b. Less personalized treatment planning.
c. AI-systems that are explainable and transparent to clinicians and patients to increase trust and accountability.
d. Provide faster, more accurate, less invasive and more reliable diagnoses.
e. More automated administrative systems.

Please note: More than one answer may be applicable

QUESTIONNAIRE 2

Iatrogenic harm in dental practice – What can go wrong and how to prevent it?

Johan Hartshorne

1. Which of the following fundamental ethical principles is directly relevant to iatrogenic harm and the foundation of safe delivery of oral health care?

a Beneficence
b Non-maleficence
c Autonomy
d Justice
e Truthfulness

2. Iatrogenic harm has a direct and indirect impact or effect on patient safety, the dental profession and healthcare systems at large (TRUE or FALSE?)

a TRUE b FALSE

3. Which of the following statement relating to the definition of 'Iatrogenic harm' are TRUE?

a Is an unintended adverse event.
b Is a preventable adverse event.
c Iatrogenic harm can arise through acts of omission or commission.
d Iatrogenic harm can originate from system failures.
e Iatrogenic harm is solely a procedural error.

4. Which of the following characteristics of iatrogenic harm are TRUE?

a Unintentional mishap.
b Can occur at any phase of care.
c Can occur in any field of dentistry.
d It is not a source of therapeutic risk or morbidity to the patient.
e Its manifestations are always delayed

5. Iatrogenic harm is a systems phenomenon (TRUE or FALSE?)

a TRUE b FALSE

6. Which of the following statements relating to the biological mechanisms of iatrogenic harm are TRUE?

a Unnecessary biological disruption is itself not a form of iatrogenic harm.
b Dental interventions have no impact on oral biological ecosystems.
c Local dental procedures may have systemic biological consequences.
d Preserving biological integrity should be a primary therapeutic objective alongside disease elimination.
e Therapeutic strategies should aim at restoring ecological balance and recalibrating host responses rather than merely reducing the pathogenic burden.

7. Iatrogenic harm commonly arises from the following interconnected causes

a Errors in clinical judgement.
b Excessive billing.
c Insufficient or excessive intervention.
d Technical or procedural shortcomings.
e Failure to preserve biological integrity.

8. Which of the following statements relating to 'The Intervention Paradox of Iatrogenic Harm' are TRUE?

a Iatrogenic harm arises from inadequate skills, not from clinical decision-making skills or cognitive bias.
b Failure to treat disease may allow its progression, while unnecessary or overly aggressive treatment may initiate a cycle of cumulative biological damage.
c Although oral health care interventions are often clinically justified, each represents a biological cost that must be balanced against its anticipated benefit.
d The optimal therapeutic pathway lies between the extremes of undertreatment and overtreatment, guided by accurate diagnosis, individual risk assessment, minimally invasive principles, and long-term biological preservation.
e Clinical success is measured not by achieving the greatest possible improvement in oral health while preserving healthy tissues, maintaining ecological balance, and minimising avoidable iatrogenic harm, but by the number or sophistication of procedures performed.

9. Which of the following decision rules relating to ethical stewardship in preventing iatrogenic harm in dentistry are TRUE?

a Think and justify before you intervene.
b Comprehensive assessment of risks before treating.
c Eliminate all oral microbes to maximize biological cost.
d Execute with precision.
e Periodic review of treatment outcomes and maintenance.

10. Future strategies aimed at preventing iatrogenic harm include which of the following:

a Technologies and AI will replace professional judgement.
b Personalised / patient-centered treatment planning and decision-making.
c Integration of precision dentistry, systems biology and digital technology.
d More informed consent and biologically respectful treatment decisions.
e Strengthening evidence-based care and patient safety.

INTERNATIONAL DENTISTRY – AFRICAN EDITION: ETHICS 2026

Please note: More than one answer may be applicable

QUESTIONNAIRE 3

Pregnancy - Part 1:
Physiological and pharmacokinetic changes during pregnancy and its impact on oral health care
Johan Hartshorne

1. Which of the following general statements relating to the 'Role and Impact of Physiological changes' during pregnancy are TRUE?
a Supports foetal development.
b Adversely affects maternal oral health.
c Influences susceptibility to oral disease.
d Adversely affects tolerance to dental procedures.
e Promotes pharmacological responses and therapeutic efficacy.

2. Which of the following facts relating to Endocrine (Hormonal) physiological changes and it impact on oral health care during pregnancy are TRUE?
a. Decreased levels of oestrogen and progesterone.
b Reduced salivary flow and buffering capacity.
c Altered gingival vascularity and immune responsiveness.
d Increased saliva pH.
e Increased risk of gingivitis.

3. Which of the following facts relating to Cardiovascular and Haematologic physiological changes and it impact on oral health care during pregnancy are TRUE?
a Compression of the gravid uterus on the inferior vena cava and aorta reduces venous return to the heart.
b Sudden increase in BP during 3rd trimester can occur while the patient is in a supine position.
c During 3rd trimester the patient is in a hyper-coagulable state to protect against haemorrhage.
d Haemodilution and hypercoagulable state increases risk of deep venous thrombosis.
e Supine hypotensive syndrome occurs mainly during the 1st trimester.

4. Morning sickness, nausea and vomiting (hyperemesis) occurs particularly during the 3rd trimester (TRUE or FALSE?)
a. TRUE b. FALSE

5. Gastrointestinal physiological changes during pregnancy presents with the following impact on the oral cavity and oral health.
a. Increased acidic environment.
b Increased saliva pH and buffering capacity.
c Dysbiosis.
d Increased risk of enamel erosion and dental caries.
e Increased gastric reflux.

6. Respiratory physiological changes during pregnancy presents with the following service delivery risks. (Provide one correct answer)
a. Dyspnoea (respiratory distress).
b Anxiety induced hyperventilation.
c Mucosal congestion and upper airway vulnerability.
d Increased sensitivity to airway restriction when using rubber dam and impressions.
e All of above.

7. Physiological changes during pregnancy impacts significantly on absorption, distribution, metabolism, and excretion of medications prescribed to pregnant patients. (TRUE or FALSE?)
a. TRUE b. FALSE

8. Collectively physiological changes in pregnant women directly or indirectly impact on oral health through the following mechanisms?
a Disrupting oral microbiome balance.
b Increasing salivary flow and buffering capacity.
c Increased saliva pH.
d Altered immune inflammatory responsiveness.
e Promote increased vascular permeability.

9. Which of the following statements relating to the link between periodontal disease and adverse pregnancy outcomes are TRUE?
a Periodontitis has been studied as a possible risk factor for adverse pregnancy outcomes.
b The oral microbiome is not considered as a biologically plausible contributor to adverse maternal and neonatal outcomes.
c Recent studies suggest that treating periodontal disease during pregnancy may reduce the risk of pre-term birth.
d The causal link between periodontitis and adverse pregnancy outcomes remains largely unknown.
e Current evidence suggest that associations exist between periodontitis and pre-term birth, low birthweight, premature birth, and development of pre-eclampsia.

10. Which of the following practical (clinical) implications of physiological changes during pregnancy are TRUE?
a Pregnancy is an important opportunity for preventive counselling .
b Pregnancy is an important opportunity for coordinated medical-dental care.
c Less emphasis should be placed on pharmacovigilance.
d Benefits and risks of treatment and medication prescribing decisions must be weighed to safeguard both mother and foetus.
e Work collaboratively with the patient and interprofessional care team.

INTERNATIONAL DENTISTRY – AFRICAN EDITION: ETHICS 2026

Please note: More than one answer may be applicable

QUESTIONNAIRE 4

Pregnancy – Part 2:
Optimizing appropriate and safe delivery of oral health care during pregnancy
Johan Hartshorne

1. **Which of the following general statements relating to 'Optimizing appropriate and safe delivery of oral health care' during pregnancy are TRUE?**
a Preventive strategies are essential due to heightened vulnerability to conditions like gingivitis, periodontitis, and dental erosion.
b Appropriate dental care is necessary and safe during pregnancy.
c The particular trimester determines whether necessary dental care can be provided.
d The particular trimester does not influence treatment planning and patient tolerance.
e Pregnancy is not a contraindication to oral health care.

2. **Which of the following facts relating to 'Assessing Oral Health and Medical Status (Risk Assessment)' during pregnancy are TRUE?**
a Incorporation periodontal screenings into prenatal care has no benefit for maternal oral and metabolic health.
b Radiographs should be taken to assess and definitively diagnose dental /oral diseases and conditions when absolutely necessary and clinically justified.
c Assess gestational age when taking the patients' medical history.
d Recording the name and contact information of the prenatal health care provider is not required.
e Provide clear explanations, respect patient autonomy while reducing both undertreatment and overtreatment.

3. **Which of the following facts relating to 'Emergency/Active infection/Pain treatment needs' during pregnancy are TRUE?**
a Treat promptly.
b Emergency management such as removing inflamed pulp or draining pus to alleviate pain, cannot be performed during the first trimester.
c Emergency treatment for acute pain or infections, are safe to perform throughout pregnancy.
d Urgent periodontal treatment should be delayed until the second trimester.
e Controlling and treating acute infections (dental or periodontal) is essential for a healthy pregnancy.

4. **Which of the following facts relating to 'Active disease treatment needs' during pregnancy are TRUE?**
a Treat according to diagnosis.
b Routine restorative and periodontal therapy is both safe and effective throughout all trimesters.
c Prioritize non-invasive periodontal therapy in early pregnancy and for high risk patients.
d Root canal therapy for treating symptomatic endodontic conditions increases adverse pregnancy outcomes.
e Tooth erosion can be effectively controlled with the use of fluoridated toothpaste or mouthrinses containing sodium bicarbonate.

5. **Which of the following facts relating to 'Elective / Non-essential care treatment needs' during pregnancy are TRUE?**
a Individualize timing and patient tolerance.
b Defer during the first trimester due to foetal vulnerability.
c Routine preventive procedures are safe in the first trimester.
d Root canal therapy for treating symptomatic endodontic conditions increases adverse pregnancy outcomes.
e Elective extractions are safe to perform throughout pregnancy.

6. **Use of radiographs, pain medication, and local anaesthesia is safe throughout pregnancy. (TRUE or FALSE?)**
a. TRUE b. FALSE

7. **Which of the following facts relating to 'Preventive and Maintenance care' during pregnancy are TRUE?**
a Continue throughout pregnancy.
b Practice good oral hygiene.
c Preventive dental procedures should be deferred to the second trimester.
d Topical fluoride strategies is well accepted for the prevention of dental caries.
e Scaling, polishing and root planing is recommended at any stage of pregnancy to preserve and to promote oral health for pregnant patients.

8. **The second trimester is often practically convenient for elective treatment because nausea may have improved and the physical burden of late pregnancy is less pronounced. (TRUE or FALSE?)**
a. TRUE b. FALSE

9. **The following medications are safe for use during pregnancy?**
a Doxycycline.
b Acetaminophen.
c Ibuprofen in 1st and 3rd trimester.
d Clindamycin
e Metronidazole

10. **Which of the following statements/facts relating to 'Prevent and Educate' during pregnancy are TRUE?**
a Prevention and early management, ideally before conception, is the most effective strategy for preserving maternal oral health and potentially reducing risks.
b Consistent selfcare, practicing good oral hygiene, preferably using a powered toothbrush, is essential for maintaining oral health.
c Oral health promotion in women of reproductive age is ineffective at optimizing maternal well-being and pregnancy outcomes .
d Behavioural and educational interventions are effective for improving periodontal health if carried out throughout the entire pregnancy period.
e Preconception oral care education is not critical for maternal and foetal health.

Please note: More than one answer may be applicable

QUESTIONNAIRE 5

The evolving electronic dental record – Revisiting clinical-, digital-, medico-legal integrity, and information governance considerations

Johan Hartshorne

1. **Which of the following ethical integrity principles related the requirements for keeping electronic records are TRUE?**
a Contemporaneous.
b Accurate.
c Attributable.
d Affordable.
e Accessible.

2. **The Protection of Personal Information Act (POPIA) is the central professional standard ethical guidelines on keeping of patient records and forms the Standard against which professional conduct is measured. (TRUE or FALSE?)**
a. TRUE b. FALSE

3. **Which of the following statements relating to patient clinical data that must be must accurately documented on electronic dental records (EDR's) are TRUE?**
a Patient identification and medical history.
b Practitioners clinical assessment and diagnosis.
c Clinical reasoning and treatment planning.
d Communication of essential patient information to other health care providers.
e Normal and negative findings that influence clinical reasoning need not be documented.

4. **The depth of documentation recorded in EDR's should be proportionate to (Select only one answer):**
a. Clinical complexity of treatment.
b Treatment risk.
c Patient vulnerability.
d Uncertainty of outcomes or complications.
e All of above.

5. **Which of the following statements relating to preserving 'digital integrity' in EDR's are TRUE?.**
a Protects patient information.
b Cybersecurity is a clinical safety issue.
c Digital images should be stored separately from the patients' EDR.
d AI-generated content should be treated as an authoritative clinical record, rather than an assistive (augmented) output.
e Dental practitioners are responsible for verifying AI-generated clinical information before it becomes part of the EDR, or informs patient care.

6. **Which of the following statements relating to 'information governance' in EDR's are TRUE?**
a Protects patient privacy and confidentiality.
b HPCSA professional record keeping, POPIA privacy, and PAIA access-to-records, are interchangeable protocols.
c Health information under the POPIA act requires appropriate safeguards and lawful processing.
d No minimum standard is required for digital information governance, or external digital imaging platforms to process patient data.
e All dental practices should maintain a documented data breach protocol.

7. **Which of the following statements relating to 'record retention and access to records' are TRUE?**
a Keeping records is not an ethical nor legal obligation.
b Patient records should be retained indefinitely where electronic retention is practicable.
c Where indefinite retention is not practicable, records should be kept for a minimum period of 3 years from the date the record becomes dormant.
d In case of an unresolved professional indemnity matter, routine destruction of a record should be suspended.
e A patient has a right to request access to personal health information held by a dental practitioner .

8. **Which of the following statements relating to 'medico-legal integrity' are TRUE?**
a Clinical reasoning is an important medico-legal component of an EDR.
b The practitioner is not responsible the clinical reasoning by, and verification of, AI generated information.
c An original clinical record should remain traceable.
d Original clinical information can be deleted or overwritten to improve the appearance of the record.
e If a complaint, adverse event, or regulatory enquiry arises, the record should never be retrospectively altered to improve its appearance.

9. **Professional responsibility and medico-legal defensibility in dentistry is evaluated on which of the following parameters?**
a A process-based standard.
b Documentation of risk stratification.
c Outcome-based judgements.
d Adherence to updated guidelines.
e Appropriate clinical reasoning.

10. **Which of the following statements relating to 'informed consent' are TRUE?**
a A signed consent document is regarded as synonymous with informed consent
b Informed consent should be documented as an ongoing communication process.
c For complex or elective treatment, documentation should establish that expectations were discussed realistically.
d The medico-legal value of documentation lies not simply in proving a form was signed, but in demonstrating that meaningful communication and patient participation occurred.
e If a complaint, adverse event, or regulatory enquiry arises, the record should never be retrospectively altered to improve its appearance.

INTERNATIONAL DENTISTRY - AFRICAN EDITION

ETHICS 2026
ANSWER FORM

CPD ACCREDITATION NO: MDB014/068/06/2026 (COLLEGES OF MEDICINE OF SOUTH AFRICA)
LEVEL: 1 : 5 CEU'S (ETHICS)

1. State of the AI-enhanced Technology in Dentistry – Ethical, Regulatory and Practical Challenges					
	a	b	c	d	e
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10					

2.					
	a	b	c	d	e
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10					

3.					
	a	b	c	d	e
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10					

4.					
	a	b	c	d	e
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10					

5.					
	a	b	c	d	e
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10					

NAME:_____ SURNAME: _____

HPCSA / DP NO:_____ EMAIL ADDRESS: _____

CELL NO: _____ TEL NO: _____

FEE: R575,00 (incl. VAT).

Payable to: Modern Dentistry Media, Standard Bank, Branch code: 018105, Account No: 021563683

PLEASE USE NAME+DP NO AS REFERENCE. ANSWERS WILL BE PROCESSED ONCE PAYMENT IS RECEIVED.

ANSWER FORMS TO BE SUBMITTED TO: angie@moderndentistrymedia.com