Global Science. Local Change.

KDIGO Controversies Conference on Technological Advancements to Support Guideline-Informed Care

Breakout Group Discussion Questions

APPENDIX: SCOPE OF COVERAGE

Of note: Specific questions related to the challenges of deploying technology-based solutions in resource-constrained environment (e.g., low-income countries) will be reserved for our forthcoming *KDIGO Controversies Conference on Guideline-Informed Care in Lower-Resource Settings* in May 2026.

Breakout Group 1: Optimizing the development and implementation of technology-supported solutions for healthcare professionals

1. Guideline implementation is the process of translating a set of recommendations and related practice points into clinical practice to influence behavior and improve patient outcomes in healthcare. What are the multi-level barriers to guideline uptake, and how can technology-supported solutions aimed to assist healthcare providers potentially address these?

2. Although guidelines are traditionally made available statically in print, how may technology-supported solutions be used to provide a "living guideline" that is continuously updated to reflect emerging evidence? What are the gaps that need addressing?

3. What technology-supported solutions are there to assist with tasks such as early identification and diagnosis of kidney disease, predictive analytics and risk assessment, clinical decision support, and the development of personalized treatment plans?

4. What evidence is there to support existing technology-supported solutions in increasing the uptake of guideline-informed medical therapy in kidney disease?

What evidence is there for the safety and clinical effectiveness (impact on clinical outcomes and resource use) of these solutions for patients?

5. How does healthcare professional delivery setting (e.g., primary care, community care, subspecialty care, inpatient vs. outpatient), ancillary staff roles, and other factors influence the implementation and effectiveness of technology-based interventions in changing professional practice?

6. What existing solutions can integrate guideline-informed care recommendations into electronic healthcare records to provide automated, patient-specific guidance to clinicians? Have these solutions been shown to be interoperable (i.e., transferrable across different healthcare settings) and effective (e.g., process measures, clinical outcomes)?

7. How should digital literacy among healthcare providers be better taken into account when promoting uptake and interoperability of technology-supported solutions?

8. Are technology-supported solutions aimed at healthcare professional behavior change that include recognized behavior change techniques more or less effective?

9. How can digital health initiatives/solutions ensure they do not exacerbate healthcare disparities?

Breakout Group 2: Role of technology to facilitate self-management and optimized health outcomes in people with or at risk for kidney disease

1. How can existing patient portals (that allow patients to view their medical records, schedule monitoring tests, book appointments, message their health care provider, and order repeat prescriptions) be used directly or as exemplars to improve engagement with care, self-management, and activation? Is there evidence this approach improves quality of care? (i.e., any specific examples relating to CKD?)

2. How should digital and medical literacy among patients (especially older adults and persons with socially disadvantaged backgrounds) be better taken into account when promoting uptake and interoperability of technology-supported solutions?

3. How can technology-supported solutions help standardize patient information that is culturally appropriate and available in all languages? What formats do these solutions need to be in?

4. How can technology-supported solutions, both within and outside healthcare settings (e.g. community settings), improve individuals' awareness of CKD and its associated complications, and what are specific ways to reduce such risks?

5. What considerations must be addressed at the design and testing phase that enable patient-facing technologies to be more effective from a patient perspective (and what does effective mean for patients)? What are prior case examples that have addressed these challenges, and how did they (or didn't they) address/mitigate the challenges? How can patients' lived experience be incorporated to (co-) create integrated, technology-supported care pathways for CKD under primary care?

6. What are the potential adverse consequences of technology utilization (e.g., information overload, adverse impact on mental health) for patients?

7. Are there specific criteria for effectiveness that have been or need to be defined and met from the perspectives of patients and healthcare providers to be able to recommend specific technology platforms or digital tools to support the management of patients with or at risk of CKD?

8. How can we ensure digital health initiatives and technology-supported solutions proposed in response to the above questions do not exacerbate healthcare disparities but rather to improve outcomes across all patient subgroups?

Breakout Group 3: Health systems, health policy, and technology

1. What examples of health-information, technology-driven solutions at the healthcare system or regional level, inside or outside nephrology, have demonstrably improved guideline-concordant care, and what can we learn from them for kidney disease care? Some examples may focus on collecting data to identify and risk stratify patients or there may be solutions that use health information technology to deliver care across populations.

2. What examples of health policy for other specialties could apply to kidney disease prevention, detection, and treatment?

3. How might health information technology-supported solutions enable guideline-based kidney care across the spectrum of organizational strategies from primary care monitoring and treatment to population-level management programs? How do cost and service readiness/ access to specialists impede these solutions in different settings, health systems, and countries?

4. What are examples of national and regional health policies that support health systems in providing evidence-based kidney care through technology versus those that detract from the delivery of high-quality kidney care? What are examples of policies that align with the scientific evidence and also promote investment in resources to overcome hurdles and pursue opportunities of technology in kidney care with exploration at multiple geographic levels:

    i. National
    ii. Regional (e.g., in US this would be state level)
    iii. Local (e.g., in US this would be county or individual healthcare delivery system level)
    iv. Individual physicians

5. How can value-based care models incentivize leveraging technology in improving adherence to guidelines for kidney disease, while avoiding unintended consequences like increased administrative burden? What are the most

significant administrative barriers healthcare providers face in delivering guideline-concordant care, and which of these could realistically be alleviated through technology implemented at the health system, regional, or national level?

6. How have societies, health systems, and individual clinicians incorporated the economic cost of implementing guidelines? How do value judgments of the physician and patients impact the process?

7. What criteria may help health systems guide decisions about investing in technology to promote evidence-based practice—clinical impact, equity, cost-effectiveness, or scalability? What metrics best capture whether technology is improving guideline adherence and patient outcomes? How can digital health initiatives and technology-supported solutions proposed in response to the above questions ensure they do not exacerbate healthcare disparities?

8. In what ways do existing health IT regulations, such as Meaningful Use, European Health Data Space, 21st Century Cures Act, regulating Software as a Medical Device, enable—or inadvertently hinder—the adoption of guideline-concordant technology solutions by health systems and healthcare providers?

9. Shifting outside of national policies, how are the international efforts of private industry (e.g., multinational pharmaceutical companies) promoting scalable health information technology solutions across countries?

10. How should we balance the need for interoperability and scalability of technology solutions across systems and countries with the need for local customization to context and patient populations? For example, the HL7 International Patient Summary uses a global common denominator when one exists (e.g., widely used FHIR resources) but allows for adaptation when there is known variation (e.g., medication coding systems). How does the cost factor in?

Breakout Group 4: Thinking outside the box: Innovative solutions and future directions

1. How can advanced computational and hybrid AI models be designed, validated, and continuously improved for real-time prediction of kidney disease development and complications—ensuring fairness, transparency, and generalizability across populations and care settings?

2. What are the roles of wearable, implantable, and biosensing technologies in detecting kidney disease of all stages, monitoring adherence, and informing longitudinal kidney care? How can interoperability, privacy, and inclusion of older or low-literacy users be ensured?

3. How can intelligent clinical decision support (CDS) systems leveraging edge or cloud computing and federated learning reduce clinician burden, harmonize competing guidelines, and maintain clinician autonomy while minimizing alert fatigue?

4. What opportunities and risks do generative and conversational AI bring to point-of-care decision support, patient education, and workflow optimization, and what governance frameworks (ethical, safety, regulatory) are required for responsible deployment?

5. Which innovative educational modalities (e.g., adaptive learning, simulation, just-in-time updates) most effectively accelerate knowledge translation and maintain provider competence amid evolving technologies?

6. How can technology enable integrated, multidisciplinary kidney care models (involving physicians, nurses, pharmacists, dietitians, and allied professionals), and what successful digital or hybrid frameworks from other specialties can be adapted to nephrology?

7. What are the top priorities for implementation science, rapid-cycle evaluation, and economic modeling to ensure scalable, equitable, and cost-effective

adoption of emerging technologies? Which metrics best assess real-world impact (e.g., guideline adherence, documentation time saved, equity-gap delta)?

8. Beyond current AI and digital-health tools, which frontier technologies (such as digital twins, organ-on-chip, bioelectronic medicine, synthetic biology, quantum computing) hold transformative potential, and what international standards for data sharing, interoperability, and ethical oversight are needed for responsible integration?