



KIDNEY  
HEALTH  
INITIATIVE

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## **Request for Information (RFI)**

## **3 Defining Appropriate Verification and Validation Studies for Physiologic**

## **4 Closed Loop Control Systems in Hemodialysis**

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## **Background on the Kidney Health Initiative**

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The Kidney Health Initiative (KHI) is a public-private partnership between the American Society of Nephrology (ASN) and the US Food and Drug Administration (FDA) with a mission to catalyze innovation and development of safe and effective therapies for people with kidney diseases. KHI is the largest kidney consortium that includes more than 100 member organizations in pre-competitive partnership with the FDA to discuss and communicate regulatory pathways for biomedical innovations.

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## Purpose of RFI

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KHI is interested in gathering perspectives and insights from a diverse group of stakeholders on broadly applicable approaches for conducting verification and validation studies of physiologic closed-loop controller (PCLC) systems in hemodialysis devices. Responses are welcome from all sources including, but not limited to, private or public companies, individuals, universities, university-affiliated research centers, and not-for-profit research institutions.

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KHI may evaluate and use responses to this RFI to:

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1. Assess the state of the art for PCLC systems in hemodialysis devices
  2. Identify and prioritize common regulatory questions in the evaluation of PCLC systems in hemodialysis devices
  3. Invite select responders and other stakeholders within a pre-competitive workshop to identify approaches and key challenges for addressing prioritized questions
  4. Communicate approaches and key challenges to the broader innovator community

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## Background

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FDA defines PCLC systems as “a medical device that incorporates physiological sensor(s) for automatic manipulation of a physiological variable through actuation of therapy that is conventionally made by a clinician”.<sup>10</sup> FDA released draft guidance titled “Technical Considerations for Medical Devices with Physiologic Closed-Loop Control Technology” on the evaluation of closed loop systems<sup>11</sup>. Examples of such systems include adaptive feedback or automated ultrafiltration during hemodialysis in the chronic or acute care settings.

## [1 Regulatory Considerations for Physiological Closed-Loop Controlled Medical Devices Used for Automated Critical Care: Food and Drug Administration Workshop Discussion Topics \(nih.gov\)](#)

<sup>2</sup> Technical Considerations for Medical Devices with Physiologic Closed-Loop Control Technology | FDA

41 As a pre-competitive forum, KHI seeks insights on opportunities to clarify and contextualize  
42 existing guidance for the development of PCLC systems in hemodialysis devices.

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- 45 Examples include, but are not limited to:
- 46     • The types of common inherent risks within PCLC systems in hemodialysis devices, and  
47         methods for documenting risk control measures within Product Specification Documents.  
48     • The type and level of data required for verification and validation studies of PCLC systems  
49         within hemodialysis devices.  
50     • Frameworks for clinical studies that include common metrics and endpoints for clinical  
51         evaluation.

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53 **Requested Information**

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55 KHI seeks insights that address the following ***technical questions*** on verification and validation of  
56 PCLC systems in hemodialysis devices. Respondents should not include confidential or  
57 proprietary information and only provide insights that would benefit the broader community:

- 58     • What level and type of preclinical verification and validation data could demonstrate  
59         safety of closed-loop hemodialysis devices in support of an application for an  
60         Investigational Device Exemption from the FDA?  
61     • What type of credibility criteria is needed for the use of computational physiological  
62         models in evaluating closed-loop hemodialysis devices?  
63     • What types of sensors could be used to automatically and reliably adjust hemodialysis  
64         parameters over the course of treatment?  
65     • What common clinical trial framework and endpoints could be used to evaluate the safety  
66         of closed loop systems in hemodialysis?

67 KHI also seeks insights on the following ***general topics*** regarding verification and validation of  
68 PCLC in hemodialysis devices. Respondents should not include confidential or proprietary  
69 information and only provide insights that would benefit the broader community:

- 70     • What solutions exist that could broadly address the technical questions described earlier?  
71         This could include evaluation of PCLC in non-hemodialysis devices.  
72     • What questions remain in applying FDA's existing guidance documents, such as those  
73         cited earlier in this document, to the evaluation of PCLC in hemodialysis devices?  
74     • What other questions remain on PCLC in hemodialysis devices to contextualize existing  
75         guidance?

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77 **How To Respond**

78 Please send responses to any or all questions to [khi@asn-online.org](mailto:khi@asn-online.org) by Friday, September 2,  
79 2022.

80 Respondents should not include confidential or proprietary information and only provide insights  
81 that would benefit the broader community. Reponses to the RFI should be concise and address

85 questions posed in the technical and/or general topics. KHI will only review responses submitted  
86 in a Microsoft Word (.doc or .docx) file.

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88 Responses should adhere to the following format:

- 89     1. Respondent information (will be redacted by KHI if response is made publicly available)  
90         • Primary Contact name, phone number, and email address  
91         • Affiliation  
92     2. Response to technical and/or general topics  
93     3. Supporting and publicly available references  
94     4. Interest and willingness to participate in a consensus workshop

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96 **What to Expect**

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98 KHI staff may request a meeting to ask select Respondents to elaborate on their responses.

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100 After reviewing responses from the community, KHI will hold a public roundtable meeting on  
101 Tuesday, September 20 at 12:00 p.m. ET to share anonymized responses to the RFI and answer  
102 questions. If you wish to participate, please contact Zach Cahill, ASN Artificial Kidney Product  
103 Specialist at [zcahill@asn-online.org](mailto:zcahill@asn-online.org).

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105 **Legal**

106 This is an RFI issued solely for information and planning purposes. This RFI does not constitute a  
107 formal solicitation for guidance or comment on existing guidance, nor does this RFI represent an  
108 obligation on the part of KHI to provide support for any ideas identified in response to it.  
109 Responses to this RFI are voluntary and may be submitted anonymously. KHI reserves the right to  
110 use the information submitted in response to the questions of this RFI at its discretion, including  
111 the right to use any submitted information pertaining to the questions on public websites, in  
112 reports, or in summaries of the state of the science. If responses are released to a public forum,  
113 KHI will redact any personally or organizationally identifiable information. Proprietary, classified,  
114 confidential, or other sensitive information should not be included in responses. KHI will not pay  
115 for the preparation of any information submitted or for use of that information.

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117 **Questions**

118 If you have any questions about KHI or this RFI, please contact Zach Cahill, ASN Artificial Kidney  
119 Product Specialist at [zcahill@asn-online.org](mailto:zcahill@asn-online.org) or 202-640-4674.

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