Article title: Perspectives on pharmacist prescribing in an outpatient dialysis center: Qualitative interviews with patients and clinicians

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Online Resource 3. Full Patient and Clinician Interview Data Table

Theme	Patients (n=11)	Clinicians (n=11)
Strengths and challenges of the current prescribing process for patients on hemodialysis	**Prescribers are accessible** In the last eight years since I am a dialysis patient, I never have any issues because here, doctor, fill up the prescription... [The nephrologists] send it right away to [the community pharmacy]. Just go directly over there. And when the medication is ready they call you to pick it up... It's very convenient whenever you need it. [If] your regular doctor is not available… [other physicians] always help. (Patient 01, male, age 53) If the doctor request [the medication], then it gets done. (Patient 02, male, age 74) I get a prescription and they send it to my pharmacy right away from here… by the time I go home, I just go to the pharmacy I get it. So, it's not hard to get… I don't have to go to the pharmacy to order it. (Patient 03, male, age 79) Once we inform the nurse, then they will write it down and then the doctor will order it for refill… All the medications we pick up on the second floor [of the hospital] except some of medications outside here we have a pharmacy closer to our place… I have always enough, say, for a week, even if I will not pick up today, there's still enough medicine... [it's] always ready when [my caregiver] goes to the pharmacy. (Patient 04, female, age 73) You can ask to see the doctor as much as you need. I generally see [nephrologist name]. I see him about maybe once a month, but they have [another nephrologist] who comes in. So yeah, it's pretty, a really good system here. (Patient 06, female, age 37) Just by asking to see the doctor and the doctor going ahead and prescribing and they contact the drug store directly, makes it easy... I just have to request to see the doctor while I'm in hemodialysis and request it and they'll come quite often and speak to me. (Patient 08, female, age 81)	**Strong interdisciplinary collaboration** Our teams are very collaborative and close-knit, and we work very much together on a lot of the decision making and between rounds and then also just outside of rounds collaborating as needed. (Clinician 01, dietitian, 21 years of practice) There's always that collaboration and hopefully open communication so that it's the patient that you're focused on, at the crosshairs of care. So could be social work, could be the dietitian or could be [nurse practitioners]. I say "interdisciplinary", as opposed to "multidisciplinary", because interdisciplinary means that we are converging whereas multi, we're all in different lanes, right? So that to me is important. There's always that intersection of collaboration and communication. (Clinician 03, nurse practitioner, 12 years of practice) I think when the physician is adjusting the medications during rounds time, that's an area of strength because we have the whole team there. (Clinician 04, dietitian, 3 years of practice) I think the strengths are our team. So, I think having practiced in a setting where we haven't had that sort of shoulder-to-shoulder meeting with the pharmacist at the bedside, gives me the perspective on how we've improved care… I had a patient say to me once… what they liked about coming into a teaching hospital setting or, in a hospital setting, is so when they had a problem, more than one person was thinking about it. And you know, I think that is a huge advantage. I have a problem, we can present the problem, and you know, ultimately decisions may come back to one or two people. But at the end of the day, we're collating input from a whole bunch of people, and a whole bunch of people are thinking about the problem. And that's the strength of a team approach. (Clinician 06, nephrologist, 36 years of practice)

When it comes to major health related issues, it's usually from my specialists… I either get them here or I get them at the pharmacy by my house… they're filled pretty fast, the doctors are pretty adept at getting the prescription off to the pharmacy for filling. (Patient 09, male, age 50)

[The doctors] fax it right to my pharmacist... if there's a reaction or whatever that it's not working anymore, they switch it up and it just goes right to the pharmacist. (Patient 10, male, age 69)

Communication gaps lead to delays

Sometimes the doctor gave me this prescription that's supposed to change the dose, and then you gonna call the pharmacy and then you know it's gonna wait time... I don't know how to deal with that because it's not my control... [doctors] have their job to prioritize. That's why I need to wait for whenever it's ready… I had a telephone consultation with my endocrinologist and then he said your blood work seems to be a little bit low for this particular and then "I need to prescribe lower dose" … I'm just expecting that somebody will call me that "oh your medication is being changed like that" but nothing called me then the following day, I need to take my medication, [so] I cut my medication because the doctor told me... I don't follow up. I don't because maybe they're doing something… I'm not the only patient that they have. (Patient 07, female, age 60)

If one of the several medications doesn't have a refill, the pharmacist will have to get a fax from the doctor or nurse requesting additional refill. And as a patient, I find it frustrating to do that particular administrative job, because I have to talk to the doctor and it wastes what I consider to be valuable time, on the part of very in-demand professional that shouldn't be, I don't want to say "wasting time", but that level of professionalism, I don't think should be used in a clerical situation... For example, for warfarin, because of the dose adjustments I have the 1 mg prescription, a 3 mg and a 5. So, I can take anywhere from 6 mg to 10 depending on what my INR number is. And I told the [community] pharmacist I wanted 1, 3, and 5 [mg of warfarin] so it would be easier for me to dose. And the pharmacist said I can't give it to you unless I know your dose. I had to go to the doctor, say "the pharmacist wants to

The strength is that we work very strongly as a team together. (Clinician 08, nephrologist, prefer not to answer)

Electronic medical record (EMR) system

We have med histories in the EMR, so prescriptions can be generated through the EMR by either using the med list for a med review first before sending a new prescription or easily, refills can be sent to a patient's pharmacy… I think our EMR system does lend to some of the strength of the prescribing, so that the NPs and the physicians have a lot of information readily available to them prior to prescribing. (Clinician 02, pharmacist, 12 years of practice)

It avoids having to write a prescription, everything is, you know, I just click something, and it goes to the pharmacy… EPIC is supposed to be efficient… sometimes it's difficult to maneuver… You could click on the wrong thing and then, so there's always potential for error... it's hard for me too, even as an inpatient [nurse practitioner], sometimes there are different clicks to get to where you want to go, and it's not sometimes as intuitive as you want it. So, for example, you know when did I last give Cefazolin? You'd have to kind of dig deep. It's not like this **snaps fingers**, right? So, you have to be savvy in how you maneuver EPIC… which I'm not. I don't think I ever will. (Clinician 03, nurse practitioner, 12 years of practice)

We have an EMR with direct connection to the pharmacies. And so, there's excellent cross communication as well as automated documentation and record keeping of what we are using, as well as hard stops via pop up messages for allergies. So that's a benefit of our current workflow. (Clinician 07, nephrologist, 10 years of practice)

Sometimes [prescribing] can be tedious to do through EPIC. (Clinician 08, nephrologist, prefer not to answer)

Renewal of medications may get missed if it's only reliant on the clinician or the nephrologist... if the fellow or person rounding could easily know what needs to be refilled through the EMR

know the dose. Could you call the pharmacist and give the dose?" It's just to me, I understand the situation, but it seems a silly thing to delay my receiving the meds. (Patient 11, female, age 69)

system, it would be easy to refill from there. (Clinician 09, nephrologist, 10 years of practice)

Strengths would be that when the medical practitioner enters it directly [into the EMR], so it's under their name, so it doesn't require someone else to cosign or to review the order. (Clinician 10, pharmacist, 15 years of practice)

Prescriptions are entered via our electronic health record, EPIC, and usually electronically faxed directly to patients' pharmacies or our local [hospital name] pharmacy... The electronic prescription format allows for good record keeping to verify when prescriptions have been sent. It keeps a list of prescribed medications within EPIC, which is generally accessible to clinicians overall. I would say it's fairly straightforward in terms of specifying parameters around the prescription, including dosing strength, the strength of the medication tablet or capsule prescribed, frequency of administration, amount to be dispensed, and refills… [but] it is sometimes the case that medications are listed as expired within the electronic health record when the number of days supplied has been completed, but in actuality, sometimes pharmacies will send fax requests for refills that are not indicated within the electronic health record. So sometimes a medication is mislabeled as expired. I would also say there is difficulty with stopping medications that have been prescribed for patients in the sense that if you wish to stop a prescription within the electronic health record, there is not a notification sent to either the patient or their pharmacy to advise them to discontinue this, it's simply removed from the list within the electronic health record. (Clinician 11, nephrologist, 9 years of practice)

Multiple prescribers challenge communication

You've got more than one doctor or prescriber able to sort of tackle filling, prescribing for ailments or refilling, titrating or adjusting doses as needed. So the units are very large and the patients, obviously, with the chronic disease burden, they have a lot of different ailments that's always sort of a moving target... the benefit is having more than one person able to handle this because then it's more efficient for workflow [and] it is more efficient for patients to get their needs met more quickly… sometimes I just find when

there's people in and out really quickly that have that prescribing ability, they're maybe making something that's happening in the moment and then not there to kind of follow that through… Some covering prescribers that are sort of in and out of the unit and come in and maybe make a change, but then are not back. I do find at times maybe the follow-up or communication, that's where you sometimes see the gaps, right, where something has been adjusted and maybe not fully communicated with the team or not an opportunity because they've been moved to a different area, different rotation. So then there's time spent by the team looking into maybe why things have been adjusted the way that they have been or why things were stopped. Was it a one-time event versus, you know, maybe practitioners or clinicians in the unit that know the patient well and have the history and have sort of seen plans that maybe are successful or not successful. (Clinician 01, dietitian, 21 years of practice)

During times where there is a consistent fellow physician or nurse practitioner, the strength is that these prescribers know the patients well and are often available to prescribe new meds if required, or refills as they're easily accessible on the unit… During times where there isn't consistent coverage or there isn't a physical presence of the nurse practitioner or physician, nephrologist on the floor, sometimes it can delay therapy. (Clinician 02, pharmacist, 12 years of practice)

Sometimes when the medications are kind of adjusted on their own, it's not always up to date on the list so that can be a bit of a miscommunication or like impact the workflow. So I think when you have certain medications that are adjusted by the same person every time, it can be a little bit easier to just know what's been done. So that's my only concern if like different people are adjusting medications, but that's already happening because we have fellows and then we have the main nephrologist. (Clinician 04, dietitian, 3 years of practice)

The main challenge, number one, might be the various physicians. For example, there might be a family practitioner prescribing who is not part of the dialysis team, for example, the dialysis [most responsible provider]. So maybe trying to reconcile what the patient

		might be prescribed if they don't bring the medication may be one issue. (Clinician 05, nephrologist, 20 years of practice) Because there are rotating fellows rounding at any given time, sometimes medication changes can be made which, without the wherewithal of the staff physician and so that can be that can be an issue whereby the medication lists are not always kept up to date. Now this is less of an issue because of our new EPIC system… [and] having a pharmacist in house as well as pharmacy residents allows us to stay on top of our medications… Before, when prescriptions were given on paper, the medication list was often not the same as what the patients were actually receiving. And so, it made it important to have reviews done. But again, if patients are given prescriptions from outside physicians, it's not always clear what they are taking and then it's really, the medication lists are as good as whoever takes the time to update them. And again, the more different people prescribe down in the unit, the more messy things can become. (Clinician 07, nephrologist, 10 years of practice)
Perceived role of pharmacists in the hemodialysis unit	**Optimize medication management and educate patients** They explain you and educate you. Especially for [pharmacist name] with medications. I know her for a long time. She's my pharmacist... I wanna know side effect of the medication, how the medication going to be long, is it for forever. Some medication, you know, you have to take forever. And some medication you're taking it until the symptoms or that problem is over in your body. So obviously you have a question and I know our pharmacy team who is very educated and they always help you out… How [my pharmacist] are trying to treat us and trying to not giving us more medication and trying to see just like how the person is doing. That kind of practice over here is amazing. (Patient 01, male, age 53) [I've seen the pharmacist] only once, to review my prescriptions… it was professional, you know it's good communication… More instruction is always helpful. It helps one understand better. What I think pharmacists could do, though, more of is, what are the side effects of the medicine the patient take... Medications and so on,	**Optimize medication management and educate patients** I see the [most responsible provider] and other prescribers constantly checking in with the pharmacist on maybe medications that would be more appropriate, medications that are contraindicated, dosing recommendations, if they need to switch something out, what their recommendation would be for that. I find especially with infections, I think they really are pulled into sort of get their expertise, but I think overall just what's most appropriate for the patients given their medical conditions and other medications that they're on. All of that bundled together with kidney failure. So it's a lot of complexity and I think the pharmacist actually is very key to sort of teasing that all apart and coming up with some solutions that are safe for the patients and then communicating that to the prescribers... when medications come up, it's certainly the pharmacist that will identify or flag maybe from a blood work perspective, things that could be optimized or adjusted or titrated up… They will give recommendations of certain medications that they will share from a literature standpoint. You know, they always do a great job of referencing large key studies and what things show benefit or not show benefit. And so they'll

and the side effects of, you know, effectiveness and so on is important. (Patient 02, male, age 74)

[The pharmacist] come down and check my medications, they review my list of medications to see if there's any that is redundant… they would tell the doctors… they were giving me an awful lot of drugs when I came out of rehab and a lot of them I didn't really need. (Patient 05, female, age 78)

[Pharmacists] definitely contribute to making sure that there's no drug interactions, especially if I wanted to start something like recently, I wanted to start a collagen supplement so they gave advice whether or not that is safe or not and recommend like what to look out for in the collagen supplement to prevent interactions… so that it's not going to interact with anything or be damaging to the kidneys... Also making sure your medication is adjusted based on blood work, like they can finesse your levels and make sure that you're in a safe zone... we went through my medication with the pharmacist and we found out that I was actually missing one of the medications because I had started dialysis in the hospital so I had a regime that was trying different things and then they finally put me on a supplement. (Patient 06, female, age 37)

It's like an updating of whatever medication that the patient has, because sometimes the doctor prescribed the medication and then the pharmacy is sometimes not updated. (Patient 07, female, age 60)

To keep an eye out on the medications that are being prescribed and to see if they're still relevant... I think they definitely contribute towards the care... keeping an eye on the medications you're taking and occasionally discussing them, asking you to bring the medications in and go over the dosage because I've had dosages adjusted quite frequently… [Explain] the purpose is of something being increased or decreased and how it's going to affect me, or if a new prescription is ordered, to find out what, if there are chances that I would have some reaction to it and how to deal with whatever the problem is. (Patient 08, female, age 81)

Confirming your medications and making sure the files are updated and helping you fulfill any new prescriptions that may come up... keeping in touch with you and your medications. See if there's any

table from that piece what's recommended, but then they also shared their clinical perspective. Because, as you know, there's the research piece and then there's the clinical piece where you also have to look at that individual patient to make decisions. (Clinician 01, dietitian, 21 years of practice)

Guiding the dosing of those types of agents, but the prescriptions are being done by nurse practitioners or physicians, so pharmacists are not prescribing those directly, but definitely already very involved in that right now. (Clinician 02, pharmacist, 12 years of practice)

I am very reliant on our pharmacists because, you know, that's their expertise. And you want to marry the clinical side with the expertise... the allied team pharmacy [is] very, very important. We can't function, I can't function without that integrated connection... we collaborate with pharmacy, sometimes we consult with pharmacy. They're there to provide, to guide us, the clinicians, in the best possible course of action. You know, the best antibiotic for this or that. So, we cannot do our jobs without pharmacy. (Clinician 03, nurse practitioner, 12 years of practice)

Usually the pharmacist does have a big role in suggesting which medication to change and dosages... In my experience, the physician will usually take the recommendation of the pharmacist in making their adjustments... they do help the physicians, I think, make more informed decisions... since the physicians have so many things to look at when they're assessing a patient, they may not always know the complete ins and outs of every medication... I think [pharmacists] have a big role to play in ensuring that patients aren't experiencing a lot of pill burden. You know, making sure that everything is kind of efficient, there's no interactions, like deprescribing when indicated. For example, a lot of people will be on a PPI for years, and then usually it's the pharmacist that will initiate the deprescribing of that one. And then also they play a role in checking blood work as well, in adjusting like iron balance. So, a very valuable member of the team. (Clinician 04, dietitian, 3 years of practice)

In my experience, I think [pharmacists are] quite helpful to try to reconcile the medication and to advising in terms of the doses.

changes… Some pharmacists recommend certain things... the drugs that were prescribed or that were recommended, they're beneficial. (Patient 09, male, age 50)

Understanding the interaction between all the medications, specific focus on medications commonly used in dialysis and the problems associated, that might be encountered by a patient on dialysis… We have to consult, and the symptoms were communicated, the adjustments were made, didn't help, more adjustments made, more adjustments made, then something swapped out… My experience is that the pharmacist is actively involved when the doctor's making the decision anyways. So, it's pretty obvious that there's a strong recommendation happening… If I have questions, you know, is it supposed to do this right, that kind of thing. I consult directly with the pharmacist. I will request that the pharmacist come and see me... Unexpected reactions and questions about that. (Patient 10, male, age 69)

Explaining what the medication is and what it does, and if it's contraindicated, and basically taking it safely, when to take it, etc... Mostly about contraindications. The best time to take it, whether to take it with food or not, things like that. (Patient 11, female, age 69)

Accessible members of the care team

[I see the pharmacist] once a month and then like here and there, with like the occasional extra. I just don't have the need [to see them more]. Also, the system here is really great. So they always ask you at the beginning of your session “Do you want to see anybody?” like doctor, pharmacist, dietician? And it's just not something I need to see regularly… I think that [pharmacists are] part of the system and being my body balance. So, whenever the team comes around once a month to review my blood work, it's always a nice conversation between all of them regarding what my bloodwork, what my stats look like, what my bloodwork is looking like, how my sessions are going, and how can they improve, if any improvement is necessary. And I do feel like that is a conversation that we've had like, it's not just one person making that decision. Everybody has input, including the dietitian. (Patient 06, female, age 37)

Particularly for dialysis patients, sometimes the dosing, we rely on the pharmacist. And also on drug levels and drug monitoring is also quite helpful. (Clinician 05, nephrologist, 20 years of practice)

The [medication] adjustment is the exclusive domain of the physicians on the team, but there's critical input, follow-up, and recommendations from the pharmacy team... [The hemodialysis care team] round on a monthly basis and we round with the pharmacy team, which includes the staff pharmacist here in [hospital name] and often students doing internships or placements. And part of every monthly review is a run-through [of] the medications… I think the more input we have, it's particularly important I think in both recognizing where there might be drug interactions and recognizing where dose adjustments, even recommending medications for example, I find particularly helpful. For example, for recommendations around sleeping medications, anxiety, depression, and advice about dose escalation... The knowledge base that the pharmacy team brings to the table and the advisory capacity is I think hugely appreciated by all of us… I think if we were to step back from that, we would sacrifice quality of care. So, I think our patients are advantaged by having a pharmacist participate in the active decisions for the treatment of the patients going forward and our dialysis patients, goodness knows, are on a lot of medications. And so, I think it's really, really helpful that way. (Clinician 06, nephrologist, 36 years of practice)

Pharmacists in their current kind of iteration and job description are mainly responsible for a few things. One is to ensure that medications are reconciled between what we believe they are on and what they are actually on... the main role that a pharmacist helps me with is just making sure that there are there are fewer errors at this… Medications that may need to be renally dosed are kind of reviewed by pharmacists, and often they give us guidance on whether we should be using a certain dosage or a certain medication. The nephrologists also have that expertise but with more esoteric medications, [pharmacists] can be an important resource. (Clinician 07, nephrologist, 10 years of practice)

I have worked with pharmacists who would not only advise - and that was pre the rights of prescribing - but they would advise, they would adapt or look for interactions and give suggestions for the

Not that frequently, although I do believe the pharmacist comes around with my nephrologist when she's visiting. So, I have the option of doing it, but I don't necessarily have to speak to them... if I need the interaction, I'd certainly get it very quickly. But it is helpful to know that they're available and you can discuss any questions you might have of my medications with them… When you're not sure of something, or if the medication has changed, they're available to discuss it with you and tell you why it's been changed, if you have a question. (Patient 08, female, age 81)

Well, how many times do your medications change, right? So, pharmacists come around, they ask you, they go through your list of medications. What are you taking? What you not taking? How many times does it actually change, right? So, for the most part, it's fine the way it is right now… For the most part I understand what those medications are for. But if I ever have a question, they answer those questions thoroughly. (Patient 09, male, age 50)

[I see the pharmacist] at least monthly… anytime I have a need [to see them], whether it's because of the monthly blood work consultation or a complaint that I have or an inquiry that I have, it gets addressed immediately. (Patient 10, male, age 69)

[I see the pharmacist] maybe once a week… I'd like it to be focused and professional. And it shouldn't have to be involve extraneous stuff… They're always available to answer my questions… I consider them part of a team in my well-being... Based on my interactions as a dialysis patient with pharmacists and pharmacist students, they've been very helpful, and they are an integral part of my treatment. (Patient 11, female, age 69)

different drugs, they would identify inaccurate or incorrect prescriptions that have been prescribed by others outside of the hemo environment, both in terms of dosing as well as the nature of drugs. (Clinician 08, nephrologist, prefer not to answer)

[Pharmacists] support physicians in prescribing or deprescribing and catching medication errors... I think they are very helpful to have them at least round on the monthly blood work rounds and comment on changes in medication doses… [they] can definitely make suggestions to me and I can follow their suggestions if in agreement, which I usually am. (Clinician 09, nephrologist, 10 years of practice)

The role of the pharmacist is to review all medications that the patients are taking at home and also that they're receiving while they're in the dialysis unit… Reviewing the appropriateness, the dosing frequency, checking for interactions, reviewing blood work and performing assessments and recommendations for any drug therapy issues that they identify… Also providing any education to the patients and then collaborating with other health care team members. (Clinician 10, pharmacist, 15 years of practice)

The role of pharmacists and their trainees in the dialysis unit includes review of prescribed medications as well as adherence to medications as described by the patient… [it] extends to consideration related to polypharmacy and reduction in harms related to polypharmacy. So, suggestions related to mitigating these risks and also optimization of dosing or scheduling to try avoid the possibility of adverse events for patients. They may also review a newly prescribed medication for interactions with the patient's current medication list, they may have suggestions at the time of prescription for particular agents that may be less likely to result in adverse effects or interaction issues… It also would extend to reviewing medications for interactions and potential adverse safety events… It also includes explaining rationale of the medications and guidance with respect to administration at home... sometimes the role of the pharmacist or pharmacy trainee is to communicate a prescription change to the patient and to advise them to pick up the medication at their local pharmacy... we often request our pharmacy colleagues to review adherence with patients and ensure that their medications as prescribed are in keeping with the understanding of

patients and ensure there's no sort of miscommunications with respect to dosing and frequency. (Clinician 11, nephrologist, 9 years of practice)

Assist with administrative tasks of prescribing

A tremendous help in the strength of the team is actually the pharmacy knowledge on facility with EPIC... [and] unfortunately we rely on older technology, which is a fax. So, we take new technology like the electronic patient record and the weak link is the fax. And then we fax to the pharmacy. And also, that keeping up to date and checking on that is a nice function of the pharmacy team. To make sure when I click that order that actually it's going to the right pharmacy… one of the requests I make, not uncommonly, of our pharmacy team is, can you liaise with the pharmacy to see whether the medications are being picked up and dispensed, are being dispensed and taken, and then patients come back for renewals… it's a link with the pharmacy that we have to do. I think because there's those gaps. (Clinician 06, nephrologist, 36 years of practice)

Pharmacists can also help with the applications for EAP [Exceptional Access Program], since not all physicians use the online system or are aware of the paper forms. So for myself, I do use the online system so I do my own EAP applications most of the time, but every now and then the pharmacists are faster and they can kind of do it before I can, so that's helpful. (Clinician 07, nephrologist, 10 years of practice)

I would have had a lot of support with regards to EAP [Exceptional Access Program] or special funding programs, etcetera from pharmacy colleagues. (Clinician 08, nephrologist, prefer not to answer)

Pharmacist and pharmacy trainees also assist greatly with reviewing coverage for medications and completion of things like exceptional access forms, which are quite important to allowing for medication coverage and therefore adherence for patients. (Clinician 11, nephrologist, 9 years of practice)

Perceived benefits and barriers of pharmacists prescribing	**Improve workflow efficiency and timely care** [Pharmacists] are going to decide according to... your blood work, condition of your whole body, whatever you're going through. So when you prescribe something and they say for you, why not. There's nothing wrong with that because right now according to the [province name] situation there's less doctors, less pharmacists, less everything. So in that case, the people who have more experience and more qualified that they are trying to help out somebody. So why not? (Patient 01, male, age 53) The pharmacy would be part of the system so perhaps, things involved would be more efficient to have the pharmacist's contribution. So why not? ... More actors, the better. (Patient 02, male, age 74) It would be handy if pharmacists could do prescriptions for dialysis... I think that'd be good. My doctor comes around once a week and you can request for a doctor to come in, but you know pharmacists would be maybe easier to come... It would be wonderful to be able to get pharmacists to do it and not have to go see the doctor… it would help a lot of people here you know, there's four shifts a day, [patients are] all looking for prescriptions… if they can get any more help and give them that, I do think it would be a good thing… you wouldn't have to wait to be seen for your prescription. Sometimes it takes really a number of days when you get your prescription and you can go into like a panic mode if you don't take it because you are low on it, say you have been taking your pills properly and that could give you a bit of stress. It would be nice if that was lifted. (Patient 05, female, age 78) When you don't have time to go to the doctor, you're going to go to the pharmacy and the pharmacist say, "OK, you can take this one over the counter." Because as far as I experienced... the pharmacist in the drugstore has an experience prescribing all the medications under over-the-counter... if they can do that here, the pharmacists in the hemodialysis, maybe they can help patients immediately… I'm very grateful that you'd open up those things because we do believe that physicians are so busy and they're cramming around, and then there's a lot of patients… if it's like a minor, then the pharmacist	**Improve workflow efficiency and timely care** For the prescribers themselves, I mean, they've got a big workload as it is. And so if some of that workload could be shifted to the person that is recommending or making recommendations… I see a big benefit… there's opportunities actually in many different areas to increase efficiency and workflow, and this would be one of them, because you would just cut off that middleman… The input is tabled, it's discussed, it's agreed upon, the prescriber then has to enter that information, but then usually it circles back to the pharmacist to phone the pharmacy to follow up on changing blister packs or making adjustments on that end. So I almost think that they are the beginning and the end. They're just not the middle piece… that's where that workflow efficiency maybe has a bit of a gap… right now, pharmacists are certainly leading that charge at the front end of this piece and the tail end of the piece, it's the prescribing is that middle piece that is the gap. So I think that would be a nice way to close that gap… You would just be able to instead go and make those changes without having to do a three-step process… the communication would still be there, I just think it would be more efficient, that recommendation is brought forward and it could just be completed by the pharmacist that's making the recommendation… I think it'd be more efficient too from a patient standpoint... they'll get things taken care of more quickly... as opposed to be a time delay, which I think is important for patients… there would be some time and care taken to review with the patient and go through that discussion with them and instead of having to sort of say, OK, I'm gonna take that back and discuss further. They could just implement and I think that also would have fresh information right there and then for the patient and maybe that would be perhaps leading to a more solid understanding of what's being changed and why. It's not any sort of negative or disrespect on other prescribers. It's just when you have to take something back, there's always a time delay, right? And that time delay could be a day, it could be a week, it could be two weeks depending on where that prescriber is, if they're on the floor covering, if they're away, if they're at satellites, sometimes there's a delay and then you circle back with the information. I find when you're in that moment of discussion and then sharing, it tends to stick with patients a little bit easier. (Clinician 01, dietitian, 21 years of practice)

will enter. It's a big help for the team here and the patient itself. (Patient 07, female, age 60)

I mean, it could help. Yeah, obviously, the more care you have, including pharmacists that can help you if it's to prescribe even minor medications to help, totally fine with that... the more care you have, the better… You have the pharmacist helping you, you're taking some of the work off the doctors, so you're helping everybody in general. (Patient 09, male, age 50)

Sometimes the doctor may not be as readily available, and it doesn't matter to me as long as I get what I need, right? So that improves the responsiveness… Doctor's busy, he's got 50 patients, it's a minor issue or whatever, I mean, yeah, by all means. (Patient 10, male, age 69)

Pharmacists have existing rapport with patients

I do trust them wholeheartedly. (Patient 09, male, age 50)

I would not have concerns [with pharmacists prescribing] because like I said, the trust and the qualification already demonstrated. (Patient 10, male, age 69)

They're accessible, friendly, knowledgeable, caring, and articulate... I trust them, and I think they've earned my trust and I think that their interaction with the team has warranted that trust... it's focused and it's based on knowing every aspect of the treatment… I think they would improve [patients' care]. (Patient 11, female, age 69)

Pharmacists' skillset and expertise

[Pharmacists] should be given more to do really than just filling prescription in their drugstore or wherever they work... I think that they are very knowledgeable, but to get to use that knowledge more would be excellent... they're professional people; they should be able to use all their capabilities. (Patient 05, female, age 78)

Pharmacists understand drugs, they understand the interactions with the drugs, they have a profile of what you're taking. Now when I'm saying pharmacists, I'm talking about the pharmacists here. Because

It would allow the current prescribers right now, which are nurse practitioners and physicians, to do something that would be more particular to their scope of practice that doesn't overlap with pharmacists. So for example, assessing decompensating patients, being able to spend more time on new hemodialysis patients and dealing with hemodialysis issues that pharmacists are less able to do in terms of assessing and diagnosing. So I think it really would free up the ability for these physicians or nurse practitioners to take care of patients in other ways and not be, if needed, and deal with other patients or more acute issues that are coming from either nursing concerns or patient concerns... There could be a model in which the workflow lends to pharmacists being the most readily available clinician that can be involved in prescribing and adjusting these types of medications... I think allowing pharmacists maybe in addition to already the prescribers that are available to do that does add more, it could lend to patients getting better care and more timely care... I think there will be less delays in either starting or continuing therapy since pharmacists are very aware of a lot of the intricacies of prescribing and availability of products and monitoring... And actually may be beneficial and they would actually be happy knowing that, rather than waiting for a physician or NP, that some of the issues might be taken care of a bit more in a timely way. (Clinician 02, pharmacist, 12 years of practice)

It might speed things up. And it would free up the doctor's time… [pharmacists are] already recommending without going into EPIC... me writing the order to some degree is incidental because someone needs to put it in EPIC, but we've already discussed it. So, because it's within my scope to write the order, then I go into EPIC and write it… it would sort of elevate practice and cut down on the middleman. (Clinician 03, nurse practitioner, 12 years of practice)

Patients not having access to a family doctor all the time and the staffing here, maybe the physicians aren't able to assess every single minor ailment. And if a pharmacist has the expertise, then it can be done and the patient will ultimately experience better outcomes, right? … I know pharmacy students do a lot of medication reviews anyway and it might be more efficient if they can just make adjustments at the same time, maybe not the student, but the pharmacist themselves and patients would be able to get what they need faster… Since [patients are] here all the time, or like 3 times a

sometimes you don't get that level of expertise at other pharmacies. But pharmacists here at [hospital name], they have a full record of your condition, your drugs. So, they know what they're prescribing. (Patient 09, male, age 50)

week at least. And they don't often see their family doctor, or maybe they don't have a family doctor, they do usually ask for prescriptions for minor ailments when they're here. So it would help with the efficiency of everything. And then patients don't have to wait to see the physician because they might be able to see a pharmacist sooner… I have noticed pharmacists do give a lot of recommendations to the physicians already about dosages and they do that for kind of all medications. So if they were able to just make the change themselves, like I don't see any issue with it… a lot of the physicians, they do just take the pharmacist's recommendation anyway, so it would kind of just be cutting out the middleman. (Clinician 04, dietitian, 3 years of practice)

Sometimes the work might be too much for the rounding fellow… they're usually busy with other things and maybe those prescriptions requests sometimes can be a bit overwhelming… that might quite make it easier for the rounding fellow... maybe it would make things more efficient… For the patients as well. I think just to get a quick turnaround… the efficiency and quick access to their prescriptions. For example, if they want the refill of this medication or this minor ailment, maybe it doesn't take as much as maybe waiting for a physician to do that. So, in that way, I think that might be useful… hemodialysis, it's a very unique place. Most of the complaints that we tend to see, some of them are quite minor, like primary care complaints and most of our patients, they don't have family physicians as well. (Clinician 05, nephrologist, 20 years of practice)

I don't have any major concerns about that. It should be fine, especially as a way to kind of offload some of the family doctor roles that we unfortunately have to take on, that might be useful... Things like routine refills, that would take a lot, a little bit of, work off my plate, although with EPIC, things are relatively straightforward and fast, but still, it would make my life slightly easier… Our pharmacists are again, they're concentrating their practice on that aspect of care, which is aka medications, they can commit more time and effort into ensuring patients have appropriate and timely access to medications. With physicians, because this is one aspect of our responsibilities, sometimes it can be deprioritized, and prescriptions take longer to refill, for example, patients may not see us more than once a week. And so sometimes when they need

something, those kind of they have to wait… having a pharmacist there may simplify things a little bit. They can also kind of get into more, pharmacists may also have other kind of direct relationships with other pharmacies and know how the system works. (Clinician 07, nephrologist, 10 years of practice)

If the clinician or the nephrologist was unable to address something, the pharmacist may be able to fulfill that role. (Clinician 09, nephrologist, 10 years of practice)

These dose adjustments would then be focused on, sort of, ongoing follow up and titration of the medications which could hopefully offload some of the issues of follow up from the initial prescriber to some of the pharmacy team... If there is addressal of some of these, sort of, routine or ongoing issues like modification or adjustment in antihypertensives and anticoagulation, it may allow patients more time to spend with their clinician on other issues of focus, so their symptomatic complaints and issues related to their dialysis prescription as opposed to their prescription medications… this would just allow for offloading some of the minor clinical changes to the pharmacy team from some of the other members of the healthcare team... If pharmacists are able to review levels once the medications prescribed and make adjustments, while letting the nephrologists and nephrology trainees know, this would assist with workflow and streamline some of the administration of these medications… It may avoid delays between nursing looking to communicate with the nephrologists, or nephrology fellows within the unit, so they may be able to receive a response relatively quickly from the pharmacy team. I would say also sometimes, the prescribing clinicians may have questions for the pharmacist and you know this could be, maybe addressed directly by the pharmacist without sort of leading to a delay with sort of cross check between the prescriber and the pharmacist... for example, sometimes, we are wondering about a dose change for patients with advanced kidney disease, like for hemodialysis recipients particularly, so we are uncertain of literature around safety of these medications. So, it's possible that the pharmacist would be able to address that directly without the prescriber needing to speak first with the pharmacist and then make the change. (Clinician 11, nephrologist, 9 years of practice)

Support medication adherence and safety

There's definitely a safety benefit, you know, correct prescribing, or timely adjustments of medication dosing or frequency especially for high-risk medications can definitely lend to increase patient safety on the unit. (Clinician 02, pharmacist, 12 years of practice)

Adding on a pharmacist who has the prescribing ability, it might just mean that there are now three people on the table who could do it. That extra pair of oversight. So, I think it would work well for the team. It would put [pharmacists] to full scope, or fuller scope than normal, I mean, than the current status. (Clinician 03, nurse practitioner, 12 years of practice)

I do think that pharmacists do have the expertise to be able to prescribe them safely, so, I think it makes sense... I feel like sometimes pharmacists do have more knowledge about medications, so maybe it would be more like, just a better medication could be prescribed to them maybe if it's done by the pharmacist… I think a lot of education on the correct usage of different medications is done by pharmacists in the community, at least. So if patients can get that here in the dialysis unit, I think maybe they'll be taking it more effectively and then they'll have better outcomes. And you know, a lot of the times patients might be prescribed medications, they don't see an improvement, and then they just get an increase in dose, or like they just get a different medication added on. But maybe they're not taking it efficiently. And if they have that education from the pharmacist to start with, maybe we can avoid all those issues. (Clinician 04, dietitian, 3 years of practice)

I think the pharmacists are already doing… the [Best Possible Medication History], the reconciliation of the medication, so in terms of safety, I think that's also an advantage to have, in my view, the pharmacist... for example titrating the doses, adjusting the doses, where the pharmacy has got all that information, it just helps to avoid missing things that might have been changed or they're going to, they might be to pick problems faster and maybe act on them even quicker. (Clinician 05, nephrologist, 20 years of practice)

[Pharmacists get] access to blister packing and other strategies for allowing for easier, better adherence to medications. Sometimes they know what pills look like and which pills would be better, how to take pills, timing, type of formulations that might work better for the patients… because they are more concentrating on the medication aspect of things, they can spend more time reviewing the indications, the contradictions, the side effects, etcetera… patients might appreciate that. Just having somebody that can spend a little bit more time going through their medications and helping them with strategies to ensure better adherence and access. (Clinician 07, nephrologist, 10 years of practice)

I think that pharmacists are perhaps better able to - more willing, I should say, rather than better able - more willing to spend a bit of time to explain the medication. And by that, I mean, if I go back to some of the work that's been done earlier, thoughtful non-compliance or non-adherence versus not thoughtful non-adherence with medications. You know, “I'm feeling unwell, I've not been feeling well for a day, my blood pressure is low, I am not taking my antihypertensives at home, and I know I have permission to do” this is probably something that a pharmacist would teach a patient better than a physician would teach a patient. So, I think that patient education component around when to adapt or adjust or not be adherent is better with the pharmacist. (Clinician 08, nephrologist, prefer not to answer)

The pharmacist role now might be a little bit more reactive because they're not the ones prescribing, so they'll see the orders after the fact. But if they were given the opportunity to prescribe, then they might be able to proactively adjust certain medications, you know, whether it's based on levels or renal or liver function or drug interactions and correct the error before it reaches the patient. (Clinician 10, pharmacist, 15 years of practice)

It may allow for closer follow-up of issues like adherence to blood pressure targets. For example, with antihypertensives in the sense that if pharmacists are independently reviewing blood pressure values and suggesting changes in antihypertensives, this may allow for, you know, a second set of eyes for patients to ensure these

targets are being reached. (Clinician 11, nephrologist, 9 years of practice)

Pharmaco-economic savings

There's probably also actually definitely some cost saving perspectives both from the patients, if they're getting medications as outpatients, but also on the unit. I do think if pharmacists were prescribing, there could be, you know, more judicious use of some medications that could lead to cost savings for the units as well. (Clinician 02, pharmacist, 12 years of practice)

I think it would also help the patient in terms of the co-pay depending on where they're going or coming from. (Clinician 08, nephrologist, prefer not to answer)

Pharmacists have existing rapport with patients

As we round subsequently monthly on that patient, the pharmacy team is going to be there. And I think it establishes the relationship … that relationship will subsequently build on the monthly rounds. So, I think instills trust... that's important, but I think building the relationship so that the patients are comfortable with the recommendations... our team, particularly with the head, our staff pharmacist, many of the patients have a pretty solid relationship with that pharmacist. (Clinician 06, nephrologist, 36 years of practice)

I would rather have a pharmacist prescribing medications, certain medications than certain fellows, specifically because fellows are temporary, transient. They don't often have a relationship with the patients and don't know the patients as well… if they are not just rotating in and out and if they do get to know the patients, then I would rather they be the ones prescribing things for patients than other fellows and residents, so the continuity is important. (Clinician 07, nephrologist, 10 years of practice)

Since the pharmacist tends to be a consistent team member and does follow the patient longitudinally, it might be helpful to have that presence compared to, for instance fellows who rotate in and out

and might not be as familiar with the patient's past medical history and drug therapy. (Clinician 10, pharmacist, 15 years of practice)

Pharmacists' skillset and expertise

From an adapting prescribing perspective, I think the pharmacist can play a big role. For example, if a change in calcium formulation is needed for [Exceptional Access Program] or to better suit a patient. For example, switching between calcium standard tablets to be swallowed whole versus TUMs... our ability to assess and manage these conditions I think is very good and we do tend to be the ones who have a good understanding of previous dosing and kind of what dose changes that are most appropriate... pharmacists have a very good knowledge of that and are able to make good decisions and have the ability to adjust prescriptions or to prescribe medications like that that are given within dialysis. (Clinician 02, pharmacist, 12 years of practice)

Talking about the prescribing role of pharmacists, I actually support that because I think it allows the team to utilize their strengths and experience for the patient, for patient care going forward... it's taking advantage of a skillset that they have that, I think, has been, and I don't mean this in any critical [way], I think has been wasted a bit. I think pharmacists are trained way beyond just dispensing, responding to orders. I think their foundational training equips them to do much more. And I think that recognition is important. And I think fostering change that takes advantage of that skill set provides, you know, in a sense, an army of people in place right now who can help... I think that resource is only now being recognized. (Clinician 06, nephrologist, 36 years of practice)

With management of antihypertensives, I think pharmacists would probably have a closer follow-up and a more meticulous, sort of, approach to it... I think pharmacists would be more attentive and perhaps aware of targets, etcetera… It's 100% dependent on the pharmacist... There are some pharmacists who I would trust implicitly and there are other pharmacists I would not wish them to be involved with any prescribing... it's a knowledge base. I think some pharmacists have an incredibly high knowledge base and have incredibly solid academic thinking patterns... But there are other pharmacists where I will double check things just because I feel that

		there is a significant knowledge gap and a lack of familiarity with the clinical scenarios. (Clinician 08, nephrologist, prefer not to answer)
Implementation considerations for pharmacist prescribing	**Collaborative prescribing** I'd probably feel more comfortable with it as long as they're willing to cross reference with others… I just get very uncomfortable if it was just, I guess one person calling the shot completely... I've experienced human error before in lots of different areas that I just know how much that can really like mess stuff up… as long as they're willing to keep those lines of communications open, maybe ask a couple other medical professionals, like hey this patient is complex and I'm going to prescribe her this, just even a heads up so that there can be some feedback. So at least everybody's on the same page... I would prefer more eyes on it than just one person. (Patient 06, female, age 37) I think that would be very helpful because they could coordinate with the nephrologist as it's a close relationship and so it gives you confidence that it'll work... the knowledge that the pharmacist could get from the nephrologist is right there that will make you feel more comfortable... If I need to have my prescription changed, I'd feel good about the dialysis pharmacist prescribing it because, as I say, they have this relationship with the nephrologist. I imagine they'd have very quick access to the nephrologist. (Patient 08, female, age 81) **Emphasis on physician oversight** I think we have our doctors over here is available… that pharmacist job is that how much of dose, and how to take it… my doctor is important to write down that prescription… If the pharmacist examine you and say this is a condition or you know this is needed and they prescribe you and anyhow they have to ask the doctor as well… if they do under supervision of a specialist, then I think nobody have any issues... if the team is involved, because the doctor actually is our main person who is in charge of everything. And this is not a small responsibility. That's a very big responsibility. But	**Collaborative prescribing** In my opinion, [pharmacists] can prescribe uncomplicated stuff as long as there's communication, right? So, for any given situation, I may know things that the pharmacist doesn't know, or vice versa. So as long as there's communication that everyone's on the same page, I have no problem with that... it's not a willy-nilly prescription. It has to be informed and it has to be sort of endorsed or vetted by everybody else within the clinical team... it cannot be done in isolation. It has to be done within the context of the general plan of care for the patient... What would matter is that you have consulted with the physician or the [nurse practitioner]. (Clinician 03, nurse practitioner, 12 years of practice) If in consultation, I don't have any problem with our pharmacy team, actually moving forward and taking the responsibility of doing the order change or additional medication. (Clinician 06, nephrologist, 36 years of practice) **Emphasis on physician oversight** I'm not averse to pharmacists prescribing medications… Most of the pharmacists should be able to, with experience and practice, manage hemodialysis patients... I don't feel like there's anything extremely special that one does in the dialysis unit that cannot be replicated by a pharmacist who has gained that experience and worked with the patients and is able to do so. I mean, if we can allow our fellows to work with boutique medications before early in their training, then I would think a pharmacist who has that experience of working with our patients and familiarity with the specific medications that we use should be able to do things just as well... it all depends on comfort level and trust of any particular pharmacist, just like I would say the same with residents and fellows… I do worry that sometimes the medications I prescribe are less related to, you know, objective guidelines, and because we often have options and there's never just one medication that we can prescribe and sometimes you have to kind of work with the patient

under his wing, and he's aware about it and time to time give the advice or give them tips… why not? (Patient 01, male, age 53)

When necessary, it must be necessary... If the pharmacist has access to all my files and understands my current health, the state of my health, then fine… I don't see a reason why not... it's done within the framework of an institution. And there are guidelines and there is oversight so I would trust if the pharmacist prescribes here in the dialysis unit, they would know what he or she is doing. (Patient 02, male, age 74)

As long as the pharmacists have knowledge about the hemodialysis for the medicine if they are gonna change it… If the pharmacist will prescribe the medication, my question is will it be approved by the doctor? … If you have access with [patient's] record in here and study what are the medication [the patient] is taking. And you're gonna change it and talk to the doctor or provide to the doctor, maybe OK. (Patient 04, female, age 73)

The doctor must prescribe medications for the patient, not the pharmacist… the pharmacist is always the assistant or on the left or right hand of the doctor… As far as I saw, the doctor is with the pharmacist. The medication that she gave will be right or correct... As a patient, you need also explain or you need to talk to the pharmacist that "the doctor is gave me this one and then you gave me this dose" … It will not contradict to the medication because it's very important that the medication that doctor or pharmacist gave us, see that's not contradiction... don't just give us "oh, your eyes is pink then go to the give the eye more" like that. I don't like that. They need to check first… I do believe in that because they are working hand in hand and then also when the doctor is coming and giving some update on the blood works, there is a pharmacist on her side… If there's a rule that for immediate prescribing on the thing that you're having trouble with your body, you can ask the pharmacist… if you have something that's going on in your body and you cannot control it, then call the doctor… [but] maybe the pharmacist is ready or available and the doctor's not available… maybe if we have the rule that the pharmacist can give prescriptions, then the pharmacist is gonna write without the doctor's prescription. (Patient 07, female, age 60)

and what they need. And so, if the pharmacist puts in the effort to really review what the what's best for any specific patient and what they're willing to take, then I'm happy for them to be involved… As long as I know what they're doing and that I'm aware of changes being made so that I don't kind of inadvertently either double prescribe or create redundancies that may or may not actually lead to overdosing or kind of interactions... for the most part, I'm not too fussed… once you have a relationship with a particular pharmacist whose kind of rounding on your patients, I think it would be reasonable. (Clinician 07, nephrologist, 10 years of practice)

The hemodialysis unit is a collaborative environment already that I think the prescribers would be open to having pharmacists more involved in prescribing… I think the medical practitioner should still be the primary prescriber but giving pharmacists the ability to prescribe if needed versus, you know, I guess deferring that entire prescribing practice to the pharmacist. (Clinician 10, pharmacist, 15 years of practice)

Support for prescribing in specific clinical areas

Prescription refills

[Pharmacists] could play a role in ensuring patients have refills as required. So oftentimes there are some delays in getting patients' medications refilled, from a refill perspective. Just if it's not typically, if physicians aren't or nurse practitioners aren't on the floor or dealing with more acute issues, sometimes refills become, as they should, a less priority for those practitioners who are very thinly spread to take care of other acute issues on the unit. So I can see that there could be a pharmacist role in sometimes aiding in prescribing for refills to ensure this continuity of medications and there are no gaps in patients needing prescriptions or running out of medications. (Clinician 02, pharmacist, 12 years of practice)

I would say no problems with the renewals. (Clinician 09, nephrologist, 10 years of practice)

Minor ailments / acute health concerns

Anything major, like if it's heart related or kidney related or something that's a little bit of a major issue, then I want my specialists to confirm with the pharmacist before I take the medication... if you were to change like my heart medication for example, I would want my cardiologist to agree to that. And confirm with the pharmacist, not that I don't trust the pharmacist, but I'd want confirmation for my comfort to know that my cardiologist would agree to that. (Patient 09, male, age 50)

In my particular case, I have some unusual problems… the doctor has a strategy for dealing with it, and it's an uncommon strategy. So, you know, it's sort of you play as you go. And so, it's not obvious that "take 2 tablets and call me in the morning", it doesn't work like that. So, the doctor's trying to get a blend of phosphate and calcium and byproducts and that kind of thing. So that's a bit of a different situation, so the doctor is the chef in this situation. (Patient 10, male, age 69)

Support for prescribing in specific clinical areas

Prescription refills

If the pharmacist could prescribe, I'm not sure about new tablets but certainly ones that the doctors have approved to be refilled, they can be refilled. (Patient 05, female, age 78)

Minor ailments / acute health concerns

Oh, that's no problem... for the minor ailment and very often, one wants to take care of it, as quickly as possible, and as simply as possible, so if the pharmacist can do that, so why not? (Patient 02, male, age 74)

I will certainly ask the pharmacist for my medication because it's just, it's not a maintenance medication that the pharmacists are gonna give you. It's like an immediate cure for the thing that I'm having. It's not maintenance… [it's] OK for me to for them to prescribe medications [for minor ailments]. (Patient 07, female, age 60)

Especially for some of the minor things, maybe [pharmacists] might be useful to help prescribing minor ailments. For example, most of the complaints might be primary care related, which will be very handy to have them assist. (Clinician 05, nephrologist, 20 years of practice)

I don't have any specific concerns about them prescribing for minor ailments. They probably have more information about things like antibiotic eye drops and other medications, constipation aids, things like that. (Clinician 07, nephrologist, 10 years of practice)

Chronic medications

Pharmacists may be appropriately placed to assist with some of the longitudinal things, and perhaps this is an easier role for even those less educated is with the renewals of what would be deemed chronic maintenance drugs. So, the renewal of the Replavite, the renewal of Amlodipine, which is a long-term drug. So, something that's been designated as long term, I think pharmacists may be more up to date with that and they would, you know, follow-up with the Plavix, it's now two years, it needs to stop. Or the bisphosphonate, it's now so many months, it needs to stop. (Clinician 08, nephrologist, prefer not to answer)

Adapting medications

The pharmacist would be able to adapt or modify the prescription based on their clinical judgment and prescribe medications that are listed, I guess, within the purview of the pharmacist prescribing regulations... it could be changing the dosage form, for instance, if the patient is unable to swallow a medication, then changing it to a liquid if possible or to have something that could be crushed or renal dose adjustment, or therapeutic drug monitoring. (Clinician 10, pharmacist, 15 years of practice)

Analgesics

Particularly I think with the pain medications. I think that, you know, patients want to see solutions and maybe the solutions aren't going to happen, but at least when they see that there's an immediate sort of adjustment or plan in place, it sort of also shows

If you say pink eye or stuff that they're familiar with very common, you know, no brainer, not no brainer but not the kind of medication that could cause a lot of problems... I would not have concerns. (Patient 10, male, age 69)

Chronic medications

A known prescription… ongoing blood pressure medications and things like that. (Patient 05, female, age 78)

Inform patients of changes (e.g., verbal, written, digital communication)

I think you guys can come and explain to the people, talk to the people, so at least everybody hear about it without not everybody able to make a pamphlet or be able to go to the Internet… meet the person or come in or in any meetings, or any way, just like in a group. You guys inform or acknowledge them. I think everybody would appreciate it. (Patient 01, male, age 53)

I think e-mail, at least for me, and perhaps text messages and so on... also in print. Patients can be handed a flyer or something, newsletter or something notifying the new policy… That the pharmacist is now capable of doing prescribing and perhaps the circumstances under which the pharmacist is able to do so. (Patient 02, male, age 74)

If they could be identified as pharmacists, that would be good. I don't know, wear the white coats with "pharmacy" written on the back... if you mentioned you'd like a prescription from the pharmacist, then indicate to the pharmacist if you see one… It's hard sometimes to see the badges, you know. If you wore the badge up [on your chest] people would be aware. (Patient 05, female, age 78)

If there's a paper that you're going to give us, "for patients, we have a new policy, which comes to some prescribing the pharmacist is allowed to prescribe", like that blah blah blah. Because it's not like "oh the pharmacist can prescribe." It's not word of mouth... there's writing, documentation... Even though the physician will not inform that the team cares about making that change quickly. (Clinician 01, dietitian, 21 years of practice)

Maybe pain syndromes, mild to moderate [pain] ... prescribing that... minor things like minor wounds, for example, maybe, that might be useful. (Clinician 05, nephrologist, 20 years of practice)

Vaccine management

Our hemodialysis patients, they're supposed to be on a number of vaccines, right? From COVID, influenza, RSV, hepatitis B, and age-appropriate vaccines like Zoster and all that. I think getting [pharmacists'] services will be quite useful in terms of that process and making it more efficient. But most of our vaccines, I think they're distributed for pharmacy and maybe the record keeping and maybe tracing the patients. I think it might make the system even more efficient. (Clinician 05, nephrologist, 20 years of practice)

Pharmacists could play a role in monitoring vaccination status. Where are we sitting with that in terms of COVID, in terms of influenza, in terms of pneumococcus, in terms of RSV. (Clinician 06, nephrologist, 36 years of practice)

Infections / antibiotics

I think there's actually, I guess, a role for in unit prescribing for medications provided in the unit. So, for example, adjusting vancomycin doses or tobramycin doses. (Clinician 02, pharmacist, 12 years of practice)

Minor illnesses, so I'm looking at things like upper respiratory tract infections… minor lower respiratory tract infections… viral infections, I think that will be useful. (Clinician 05, nephrologist, 20 years of practice)

This may extend to things like antibiotic therapies that require therapeutic monitoring, for example, of vancomycin dosing in patients who are having monitoring of trough level. (Clinician 11, nephrologist, 9 years of practice)

us, and if there's a paper, I do believe that it's legit. (Patient 07, female, age 60)

I have access to the [hospital name] portal, so [if] something came through [that]... Personally, if they're around… in-person would be good… I would like to be informed that this was happening and be able to have access to the pharmacist in case I had questions. If I was home and I had to make a phone call to be able to reach the pharmacist. (Patient 08, female, age 81)

Just verbal communication is fine, yeah. I don't need anything more than that. (Patient 09, male, age 50)

A letter or something, just you know, or a consultation. Yeah, not overly complicated, yeah, just a little memo... What and why, that's all. Just like they did with the pharmacist in the local pharmacies with the pink eye, right. The logic is they have the training, blah, blah blah. We already know that. So don't reinvent the wheel… it would be bonus, not required, but a bonus if they articulated their confidence, you know, perhaps the memo signed by the pharmacist and the doctor. (Patient 10, male, age 69)

Like a personal visit. (Patient 11, female, age 69)

Specific clinical indications

So that could be monitoring blood work and adapting and prescribing medications that require [therapeutic drug monitoring]. (Clinician 02, pharmacist, 12 years of practice)

Maybe not carte blanche, maybe start off with like the tried and true like the [phosphate] binders… anemia, CKD-MBD, hypertension. (Clinician 03, nurse practitioner, 12 years of practice)

In terms of what the patient is taking, in terms of adjusting the doses as well, and maybe recommending whatever changes need to be done, that would be quite handy. And also things like blood pressure treatments where one needs to titrate the dose in terms of response to treatment, that would be one area that I think maybe it might be handy… Things like anticoagulation, the warfarin, for example, would be very useful in terms of getting that help in my view... to follow up the INRs and adjusting the warfarin doses. (Clinician 05, nephrologist, 20 years of practice)

I think there's a couple of areas where it's particularly important. I think one is in the management of hemoglobin… the second area I think we discuss a lot, although we share management in that regard, and that's in INR... The other area is around calcium phosphate homeostasis. (Clinician 06, nephrologist, 36 years of practice)

Medications that could be deprescribed or dose dependent could be used, like warfarin for example, those kinds of things that you can kind of titrate, titratable medications… Calcium [phosphate] binders… Antihypertensives would be another option to focus on… Medications that can be relatively easily protocolized like EPO medications, iron, those would be a good start. (Clinician 07, nephrologist, 10 years of practice)

In units where the pharmacists are prescribing the warfarin and adapting the warfarin, I think that there is better outcomes... I think the second [area] would be, for example, with management of antihypertensives… Darbepoetin and iron might be another

protocolized sort of thing. (Clinician 08, nephrologist, prefer not to answer)

Perhaps, if a patient is on warfarin, for instance, having the ability to change a patient's warfarin dosing based on the INR results. (Clinician 10, pharmacist, 15 years of practice)

I'm in favor of more autonomy for our pharmacists in prescribing medications, you know within a predefined clinical scope... [dose-dependent or ongoing medications] would have the benefit of already being selected by the prescriber and so particular indications would have been reviewed by the nephrologist or nephrology fellow, and so that aspect of agent selection would already have been addressed ideally… some of the particular areas of benefit would be issues related to antihypertensive dosing as our pharmacy team is quite helpful in reviewing some blood pressure trends and suggesting medication modifications related to this. I would also say another area is anticoagulation monitoring, so ensuring patients are in therapeutic ranges for medications like warfarin and providing dose adjustment guides… just record keeping within the electronic health record or within other areas. So, for example, for anticoagulation, it's often been suggested that we could have, you know, a flow sheet of things like INR levels and anticoagulation dose, which could be monitored directly by the pharmacist and maintained by the pharmacist to avoid further burdens on the prescribers. (Clinician 11, nephrologist, 9 years of practice)

Phased approach to implementation

I think maybe if you bucket it, you know like anemia, CKD-MBD, hypertension… [phosphate] binders, pain management, Tylenol. I mean, that's low hanging fruit and I don't mean that in a derogatory manner. But if you get into the hydromorphones, and into the fentanyls and into the patches, that requires more conversation, shall we say, as the drug becomes more complex. (Clinician 03, nurse practitioner, 12 years of practice)

I think it should be a phased approach. So maybe start with one thing, so we start with anticoagulation, then see how it works and just build it into the system... let's say, adjusting doses for

antihypertensives, maybe just see how that works. Or if they're treating minor ailments, maybe start with one thing, rather than many things at the same time... introduce it gradually, maybe start with one thing, just to see how they're comfortable. You know, it's quite a busy unit... the pharmacist, the number of people that are involved there, so that it's not overwhelming. (Clinician 05, nephrologist, 20 years of practice)

It probably will be incremental, but I think it can be implemented… start off with anemia management, let's move on to hypertension management and we could do that each and every, so that we could have, over 3-4 months, we would say anemia management, calcium phosphate homeostasis, blood pressure management, antibiotics. We could address those sequentially in a monthly round. And then over that, that means within a 3-6 month period, we would transition all of those care areas to where the pharmacist might take a more active role in the prescribing... For simplicity, just makes it easier... those are the primary areas each month we focus on… that provides the foundation for addressing them one by one. (Clinician 06, nephrologist, 36 years of practice)

There should be first a committee on which medications to start off as a pilot. So certain medications that are kind of frequently used in dialysis units. There should be, kind of, reviews done to see between pharmacists and physicians to review the prescribing and whether it's something that we feel was appropriately done, so like a supervisory role for the first month or two. And based on that, you know, the scope and rule can be expanded. So, I would say in a step-wise way with lots of kind of frequent reviews... start with a weekly review for a month and that which could be incorporated into weekly rounds, for example. You know, certain patients could be involved in that pilot program or potentially new incident patients could be involved, like a single morning or afternoon shift could be used as a pilot. And then after a month or so, based on feedback and how things are going and the comfort level of both pharmacist and practitioner, it could be expanded. Or, and the reviews could be like monthly or during monthly rounds and then, again, depends on how often the pharmacist is going to be prescribing, and what. (Clinician 07, nephrologist, 10 years of practice)

Perhaps just start off with just renewals initially, then perhaps have a discussion with the dialysis team and the nephrologists, if they should now expand their scope to new medications or medication adjustments... [if] after the short pilot renewals, there was no concerns by other clinicians, including myself, then I would be happy to move forward. (Clinician 09, nephrologist, 10 years of practice)

I think it could start off with guidelines in terms of maybe classes of medications either that you could prescribe or ones that perhaps they wouldn't be able to so, it could be high alert medications or a note that if the patient is on it at home, that would be allowed… it might be similar to how NPs practice, even though I know the scope is different, but starting off with like a perhaps a restricted prescribing list could be an option to consider to sort of ease into it. (Clinician 10, pharmacist, 15 years of practice)

Patient and clinician buy-in

You have to have physician buy in... I don't know if they're willing to, how comfortable they are. I can't speak for them because I'm not a physician. But some might say, yeah, it will make my job easier. But then that's taking away a bit of their role and billing. I'm not sure if billing is going to be affected. (Clinician 03, nurse practitioner, 12 years of practice)

All the nephrologists kind of have to be on board. (Clinician 04, dietitian, 3 years of practice)

There may be some early patient barriers I can foresee that, I still have some patients on my shift who will only speak to me and that includes even the renal fellows. That's uncommon. But some patients develop that relationship. You know, patients will sometimes speak differently to the nurses, the pharmacists, the dietitians, than they will to me. I think it's just an unfortunate fact of life with some patients. And so, I do think that there'll be the occasional patient barrier, but I think it'll be easily scalable... in any change I think it's critical not only to get my opinion but actually even more important to get the opinion of the patients - how do they feel, what would they suggest? So, from my perspective, I can suggest while this communication, you know, shared responsibility

and decision making, but I want the patient to tell me what they think about that. Because if they feel uncomfortable, then, so we would see why they're uncomfortable and then we'd have to identify how we could address that discomfort, to try to lower the barriers to implementing that kind of change. So, speaking to the patients and getting their consensus. (Clinician 06, nephrologist, 36 years of practice)

We would have to ensure that patients would be comfortable in receiving direct prescription from the pharmacist involved in their care. (Clinician 11, nephrologist, 9 years of practice)

Resources to support increased responsibility of pharmacists

I think pharmacists are very well suited on the unit to be able to do that, if there is enough pharmacy presence... the caveat really is what, how much pharmacy coverage there is and to be able to do that responsibly... if pharmacists are taking on another role of prescribing, they should have more allocated resources, so additional pharmacist [full-time equivalent] and presence on the unit... I think it would definitely at this time be required to be a shared responsibility rather than sole responsibility of pharmacists for particular prescribing just because the current, like number of pharmacists working on the unit and compared to the number of patients is actually very minimal… I guess discussions from a leadership perspective in terms of ensuring that there is enough money and resources to support pharmacists playing a bigger role on the dialysis unit. (Clinician 02, pharmacist, 12 years of practice)

When I think about implementing this sort of plan, do we think that we have got more resources? I know our pharmacists are in short supply. Do you think we might be able to get more pharmacists? ... just to bear in mind the allocation, whether that will not be overwhelming as well on the part of the team, the pharmacist. Because one [pharmacist] might find it very difficult to do that. (Clinician 05, nephrologist, 20 years of practice)

What sort of model of remuneration is there? I think people who take on responsibility to make decisions should be paid for that. (Clinician 06, nephrologist, 36 years of practice)

I worry that the same effect will occur as it has now, where patients kinda come to us and so their family doctors for these things would be, kind of, then the burden would go on to our pharmacists. Where on one hand that would be reasonable and take some pressure off us. But on the other hand, then our pharmacists would not be able to focus on more kidney-related issues and then because they would kind of constantly be inundated with requests for these minor ailments. (Clinician 07, nephrologist, 10 years of practice)

Clearly defined responsibilities and communication among the HD care team

It would have to be very clearly communicated and very clearly outlined on what the process is… make sure that everybody is sort of aware of the process that's going forward and figure out sort of how the needs can be met with all the MRPs [most responsible provider] … Every MRP works a bit differently and some are much more hands on collaborative, sort of in contact regularly, but you don't always have that. You know, some MRPs are not [in the dialysis unit] as frequently, but they still like to be informed and involved of the decisions… there would still be some work to be done in terms of like how that's communicated or ensuring that that knowledge to the MRP is made just so everybody stays on the same page and there's no sort of missed connections or collaborations. So really, it's just about the communication. I think as long as it's rolled out and communicated well, I don't foresee too many issues, but there's a lot of moving parts… If something that's going to be changed and then somebody comes back and says, oh, I didn't know you changed that, I went ahead and changed this… if the staff is informed and you've got the same messaging, then you're always having that consistent message if patients have questions, at least if a pharmacist isn't around at the immediate moment. For example, myself, if I've been informed and I know sort of the process and what that scope looks like if somebody had a question I feel like then any of us could answer that in a very consistent message. (Clinician 01, dietitian, 21 years of practice)

I think that the current physician/nurse practitioner group should be involved at the discussions in terms of rollout. I do think it would be helpful to delineate and very clearly state what pharmacists would be responsible, or could be involved in from a prescribing

standpoint. So very clearly let the rest of the team know that what would either what class of medications or what type of prescribing pharmacists would be able to do on the unit, whether it be outpatient prescriptions versus in-patient prescribing, or I guess on-unit in dialysis prescribing. (Clinician 02, pharmacist, 12 years of practice)

If there is like a workflow in place where, if the pharmacist is making changes then they contact or notify the nephrologist in a certain way and they're aware that they will be informed through this method, then that could help mitigate that issue. But other than that, I don't see any potential issues... [nephrologists] have to have a clear method of communication with the pharmacists to make sure that they're aware of all the changes that are being made. (Clinician 03, nurse practitioner, 12 years of practice)

The only barrier and challenge would be, like I said, the workflow, the communication of everything. I know, as long as EPIC is up to date, like technically it should all be fine. But sometimes, a nephrologist might have an idea of what medications the patient is on in their mind already and not necessarily refer back to EPIC when making changes. So that's the only area that I could see potentially becoming an issue. (Clinician 04, dietitian, 3 years of practice)

What might just need to be clarified [is] to what extent? In terms of the range of prescribing, for example, is it minor or major issues that's where maybe we just need more clarity with regards to that. … that's what just needs to be delineated in terms of the role and if that can be clarified, just to make, maybe things will be smoother… It would be important to always let the MRP know, for example, if it's an adjustment to the doses, I think, adjust and let the MRP know, or if you want to clarify something with the MRP, that will be handy. (Clinician 05, nephrologist, 20 years of practice)

But I worry that you know the same kind of effect will occur as it has now, where patients kinda come to us and so their family doctors for these things would be, kind of, then the burden would go on to our pharmacists. Where on one hand that would be reasonable and take some pressure off us. But on the other hand, then our pharmacists would not be able to focus on more kidney-

related issues and then because they would kind of constantly be inundated with requests for these minor ailments. So on one hand, you could have the pharmacist, you could have a division of duties where the pharmacists take care of more of these minor ailments, whereas the physician, dialysis physician is taking care of most of those other issues versus, you know, kind of like the dialysis unit focusing on dialysis-related issues, pharmacist and physician alike. and I'm not sure what would be most effective or efficient… If it created redundancies without, due to the lack of communication, then that might make more work for me, having to kind of parse through what had been changed, what had been done. With appropriate documentation and communication, I think that might be reasonable. I think that's the major thing. I do feel that it's important that if a pharmacist is going to be prescribing in our dialysis unit, then I would prefer that there be some sort of continuity that allows them rather than you know them kind of jumping from shift-to-shift patient to patient to physician to physician. And so I wouldn't have to kind of figure out who the pharmacist in charge of a particular patient is. I'd rather have like one point of contact. Similar to our dietitians. (Clinician 07, nephrologist, 10 years of practice)

Communication with the MRP in the dialysis unit, and if they're in agreement with the prescribing could be the only barrier, if there's going to be a barrier. (Clinician 09, nephrologist, 10 years of practice)

There might be uncertainty, I guess, for the medical team or the nursing team, as to who would be entering the orders for a given patient… There would probably need to be set guidelines... so that it's clear whose responsibility it would be, whether it's by medication or by situation based… The pharmacist has other activities and other responsibilities as well. So, you know, ensuring that the workload is not placed directly on the pharmacist to order all medications. (Clinician 10, pharmacist, 15 years of practice)

Some of these ongoing adjustments with medications could be guided with things like algorithms to dictate when to adjust medications, so as long as these are agreed upon by the pharmacy team and the nephrologists, there should be good safety in terms of modification of dose changes overtime with the pharmacy group...

nursing staff would also have to be sort of advised of this and we'd have to ensure there was a clear understanding from our nursing staff as to what medications our pharmacy team may be able to assist with in prescribing versus medications that would not be… It may be helpful that there be a particular notification strategy for the pharmacists to advise the nephrologists or fellows regarding a prescription addition or change. So, would this come as a, you know, message in the electronic health record and e-mail? If there was one standardized approach to this, I think this would allow for better communication. Also, if there is need to sort of confirm a medication prescribed by the pharmacist, if there's a standard way for nephrologists to sort of co-sign or review this, this might be another implementation strategy that would increase the comfortability of this type of change in workflow… there would need to be some update of things like electronic health records to ensure that pharmacists can enter prescriptions in our electronic health record and that this is viewable to other prescribers like the nephrologists in the nephrology fellows and residents… Some of the other sort of implementation barriers would be like if there is sort of a routine practice of prescribing anticoagulation or antihypertensives that there may be some agreed upon algorithms or heuristics that the team can review together before implementation to ensure that everyone's comfortable with pharmacy-guided management of those medications under the guidelines of an algorithm or prescribing approach in sort of a pre-specified format. (Clinician 11, nephrologist, 9 years of practice)

Inform patients of changes (e.g., verbal, written, digital communication)

We have some [patients] that don't speak English or read English, so there could be some challenges there… I know that they have opportunity to stream things on their TVs because they no longer actually have Wi-Fi in channel. So there might be something on there. You could do a simple handout, but I think it would really have to, well, I shouldn't say - this is just my perspective - I think patients need something tangible to take home… The reinforcement piece would be when the pharmacist is actually speaking with a patient about something, whether it's hypertensives or pregabalin, whatever that looks like. That would be where they would just reinforce that messaging. And maybe it's something as simple as, I

certainly will communicate, you know, “I think from what we've talked about and what I've looked at in your medical history and what the literature supports, I would recommend doing A, B and C” and then from there saying “I actually I do have that ability to prescribe that right now to you, I am gonna keep your doctor in the loop” but sharing that information at the bedside as well. I think that would be the reinforcement piece. So, as you're seeing patients and you're prescribing independently, that messaging could just be reinforced. (Clinician 01, dietitian, 21 years of practice)

I'm not sure if it actually needs to be, but I guess that would depend on the scope of which pharmacists are going to prescribe in the unit. I honestly could say that I'm not actually certain if patients know who are prescribing their medications right now, I think they likely believe it's the physician. But we do have many different levels of prescribers on the unit. For example, fellows, fellows that are there just for a day, fellows that are there long term, obviously their primary nephrologist, and nurse practitioners that either are constant or not. So I'm not sure if we, I'd actually look back and see like if that even needs to be communicated with them. For the issue of transparency, I think we could, but it could also just be done very informally during the next interprofessional rounds where they can talk as a team. And just generally let every patient know as they go through that the pharmacists are playing a bit of a bigger role, or a different role, within the unit and might be around to prescribe in different capacities. (Clinician 02, pharmacist, 12 years of practice)

The typical thing is to maybe just give them a newsletter, or like a letter… Don't let the nurses do it, do it yourself. Like the pharmacy team introduce themselves to the patients and give them a letter. Some of these patients will not remember, right? But if you at least go and introduce yourself. And make sure again your presence is very, very important. You can't just be in the office and input stuff and wait for nurses to come and get you. You have to be out there in the trenches. (Clinician 03, nurse practitioner, 12 years of practice)

That's a tricky one since a lot of our patients receive information in different ways. Like we do use the portal a lot to communicate with patients, but not all of them are experienced with technology and able to use it. So, I think it's important to have different methods

that they're being conveyed this information through just to make sure that every single one of them is fully aware of what's going on. So, the portal could be one, the patient newsletter could be one, word of mouth by the unit staff, unit clerk, nurses, pharmacists, and nephrologists during rounds. So just reiterating the change often. (Clinician 04, dietitian, 3 years of practice)

The pharmacists are part of the treating team, the MD team that rounds with the patients. So, I think the MRP, when they're rounding, the pharmacist is there, just inform the patients as they're rounding... what would be useful is during the rounds, the MRP, just inform the patients in addition to obviously, if there's any formal memo sent. (Clinician 05, nephrologist, 20 years of practice)

That becomes part of the discussion on the rounds, and it is reinforced on the rounds. It's a setting in which the whole team is present and right in front of the patient and we can introduce and reinforce with each month. (Clinician 06, nephrologist, 36 years of practice)

I'm not 100% sure what the best way to communicate it. First of all, there will be a bulletin that will be put out. I mean, we do release bulletins and patient information kind of newsletters. That will be the first step. (Clinician 07, nephrologist, 10 years of practice)

Perhaps a nursing staff could triage medication issues, including new medications and medication adjustments and renewals to the pharmacist. So, I don't know if the patient necessarily needs to be told beforehand, but once that policy is stated**,** they could be told in real time as concerns arise. (Clinician 09, nephrologist, 10 years of practice)

I think it could be communicated, for new patients that start in the dialysis unit, just to let them know that this is the practice at this site. Or even when the pharmacist first meets with the patient for BPMH or Med Rec, for instance. There are lots of opportunities so, could be part of their initial orientation to the unit even. Doesn't have to necessarily be told by the pharmacist. It could be by the coordinator or the nursing team as well. (Clinician 10, pharmacist, 15 years of practice)

	Providing them with something like a short letter with some clear written information as to what the scope of this type of change would probably be beneficial… There would have to be some patient education around this and explanation of the rationale and scope for some of these pharmacy-prescribed medications… I think at the bedside during hemodialysis sessions is probably the most effective way. Our patients are already overburdened with contacts with our healthcare system and so, as opposed to suggesting a, you know, separate set of visits or town hall meeting or something like this, I think visiting patients at the bedside to discuss this... this would allow them, you know, to voice any questions. So, I think that type of discussion at the time of a hemodialysis session would be best. (Clinician 11, nephrologist, 9 years of practice)