Original Article

Build your own all-virtual multidisciplinary kidney stone clinic

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Background: With the dramatic rise of telemedicine in the post coronavirus disease 2019 (COVID-19) pandemic, our objective was to develop a totally virtual multidisciplinary kidney stone clinic and assess patient satisfaction of this format.

Methods: The virtual multidisciplinary stone clinic began July 2021 and continued monthly. Prior to the beginning of each clinic, providers from the urology, nephrology, and dietitian teams meet virtually to discuss the patients. Patients would then log into WebEx virtual platform and providers would subsequently log into the patient's virtual room, to review radiology, laboratory results, and dietary logs then provide counseling. Patients were then sent a survey via electronic mail regarding their experience. A 5-point Likert scale was used for responses ranging from strongly disagree to strongly agree. Scores were averaged to rank results.

Results: A total of 122 patients were sent surveys, and a total of 31 surveys were completed. Sixty-one percent of patients strongly agree and 13% agree that they felt comfortable using the virtual platform. When asked if they prefer using the virtual platform for their visit, 70% of patients agreed or strongly agreed and only 16% of patients disagreed or strongly disagreed. In regards to potential advantages of a virtual visit, the Likert scores were averaged and ranked from most to least important with improved timeliness (3.7) and ease of scheduling into day (3.6) the highest rated advantages. Most patients did not find any concerns using the virtual platform, however the ability to see the provider in-person and connecting personally was of highest concern with an average Likert score of 2.3. Overall, 83% of patients agreed or strongly agreed that the multidisciplinary stone clinic satisfied their kidney stone related questions regarding treatment and prevention.

Conclusions: A virtual multidisciplinary kidney stone clinic can be implemented with high patient satisfaction scores and help overcome the limitations of physical clinic space and provider schedule coordination. There are few disadvantages to using the platform.

Keywords: Nephrolithiasis; virtual clinic; multidisciplinary; survey

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Introduction

In the United States, it is estimated that 1 in 10 people will have a kidney stone event in their lifetime (1). Kidney stones represent a financial burden on society with an estimated 2.1 billion dollars spent on stone disease in 2000 (2) and significant economic stress on individual patients (3). Patients may experience a high rate of stone recurrence (4), therefore prevention is a crucial component in the management of kidney stones which includes lifestyle modifications,

dietary interventions, and pharmacologic therapy (5). The multifaceted management of kidney stones lends itself well to a multidisciplinary approach, but challenges with coordination of provider schedules and obtaining a physical clinic space have limited adoption of this format.

The coronavirus disease 2019 (COVID-19) pandemic caused a significant disruption across the world and in the medical field including the dramatic rise in the use of telemedicine to deliver medical care (6). Several studies have demonstrated the feasibility and advantages of virtual clinics in the field of urology (7,8) which continue to be used despite the end of the COVID-19 health emergency in the United States.

Combining the rise of telemedicine and need for a multidisciplinary approach to managing kidney stones, our objective was to create and assess satisfaction for a totally virtual multidisciplinary kidney stone clinic at our institution and assess patient satisfaction with this novel format. We present this article in accordance with the SURGE reporting checklist (available at https://tau.amegroups.com/article/view/10.21037/tau-24-248/rc)

Methods

The study was submitted to the Oregon Health & Science University Institutional Review Board (IRB#00023593) and determined to be exempt due to the minimal risk to the participants. Informed consent was obtained from the participants of this study. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The virtual multidisciplinary stone clinic began July 2021 and was held monthly with a morning and afternoon session. The clinic was comprised of one urologist, one nephrologist, and one dietitian. Prior to the beginning of each clinic session, the teams met virtually for 20 minutes to review and discuss a preliminary plan for the patients. Patients then log into the WebEx virtual platform (Cisco San Jose, CA, USA) and providers then joined the patient's virtual room sequentially to review radiology, laboratory results, and dietary logs then provide counseling. Each provider is scheduled for 30 minutes. The urologist focused on symptoms, radiology review, and surgical options. Nephrologist discussed medications, labs and 24-hour urine results. The dietitian reviewed diet logs and recommended nutritional changes. A running Microsoft Teams® group chat is used to discuss new information from the patient and/or changes in management based on their visit (*Figure 1*).

After completing their clinic visit, all patients who participated in this clinic were sent a survey via electronic mail regarding their experience. The survey was created online using the Qualtrics platform. A follow-up electronic mail was sent to patients who had not completed the survey several weeks following the first email followed by a phone call requesting completion of the survey or offering to mail the survey or help fill it out over the phone (C.J.). The survey was performed over a 6 months timespan and patients were a mix of initial consults and return visits. Only patients within Oregon were seen for the telehealth visit. No incentives were provided for completing the survey. The survey was composed of twenty-five questions regarding interventions tried prior to their clinic visit, counseling during their appointment, satisfaction with the clinic, and advantages and disadvantages of the clinic. The survey was created by the practitioners of the clinic and went through several rounds of iterations until all parties agreed upon the context of the survey.

Highlight box

Key findings

- A multidisciplinary virtual stone clinic consisting of urology, nephrology, and nutrition was successfully implemented at our institution with high patient satisfaction. Improved timeliness of the visit was most important to the patients while not seeing the provider in-person was the biggest potential disadvantage. Eighty percent of patients would recommend the virtual multidisciplinary stone clinic to a friend or family member.

What is known and what is new?

- There is growing interest and demand for virtual clinics in the post coronavirus disease 2019 pandemic era. A multidisciplinary approach to kidney stones can be advantageous given the complexity of management.
- We demonstrate the development and feasibility of a completely virtual multidisciplinary kidney stone clinic. High patient satisfaction can be achieved with a virtual clinic.

What is the implication, and what should change now?

- A virtual multidisciplinary kidney stone clinic can be easily implemented at other institutions.

Statistical analysis

Responses were collected in free text format as well as on a 5-point Likert scale. Qualitative statistical analysis was performed. The Likert scale responses were then averaged in order to rank the potential advantages and disadvantages to the virtual clinic.

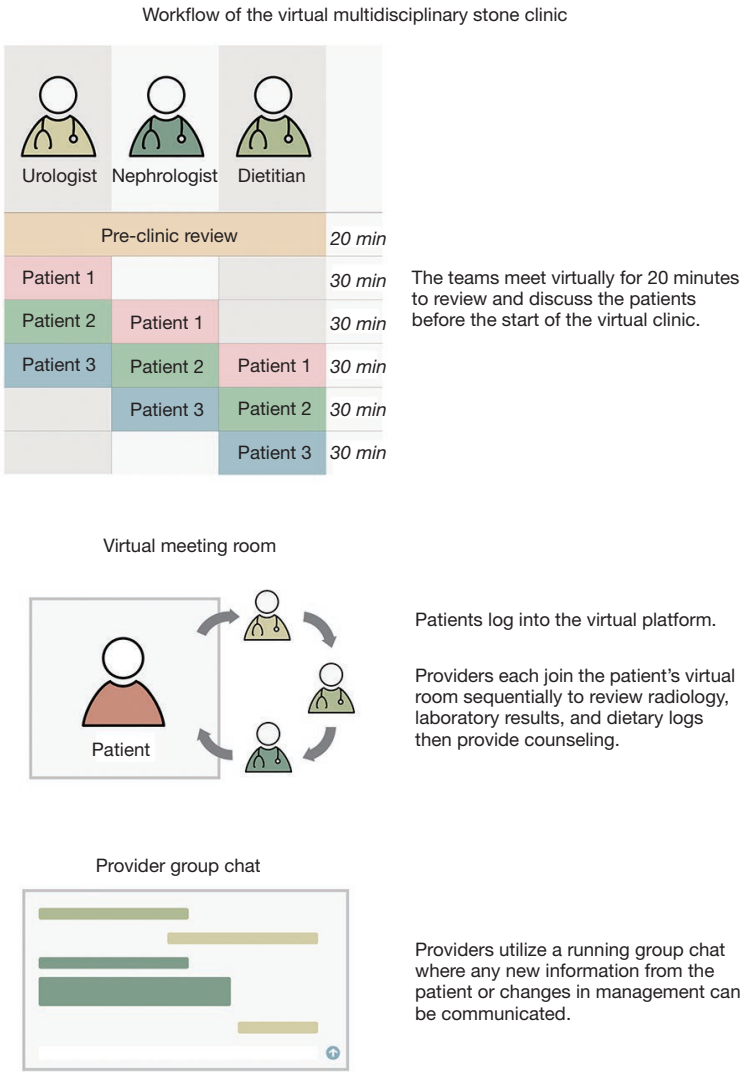

Figure 1 Format of the virtual multidisciplinary stone clinic. First the patients are discussed by the urologist, nephrologist, and dietitian for 20 minutes then individual providers have a virtual appointment with the patient for 30 minutes. Finally, a running group chat is utilized to discuss any changes to the patient's plan.

Results

A total of 122 patients were sent electronic surveys with 36 surveys started and 31 surveys completed. Only completed surveys were analyzed. Sixty-one percent of patients strongly agreed and 13% agreed that they felt comfortable using the virtual platform for their healthcare visit while only 8% disagreed and no patients strongly disagreed. When asked if they prefer the virtual platform for their visit, 69% agreed or strongly agreed while 16% disagreed or strongly disagreed.

Patients were asked the importance of potential advantages of the virtual visit. The averaged Likert scores indicated that improved timeliness of the visit was most important (3.7) followed by ease of scheduling into the day (3.6) while avoiding exposure to infectious diseases was least important (2.8) (*Figure 2*). Potential disadvantages of the virtual visit including not seeing their provider in-person (–2.3), lack of physical examination (–1.9), and difficulty of logging into the virtual portal (–1.9) were most concerning. The cost of necessary telecommunication equipment was least concerning (–1.4) (*Figure 2*).

When asked if patients felt like the provider thoroughly discussed the surgical treatment options with them, 76%

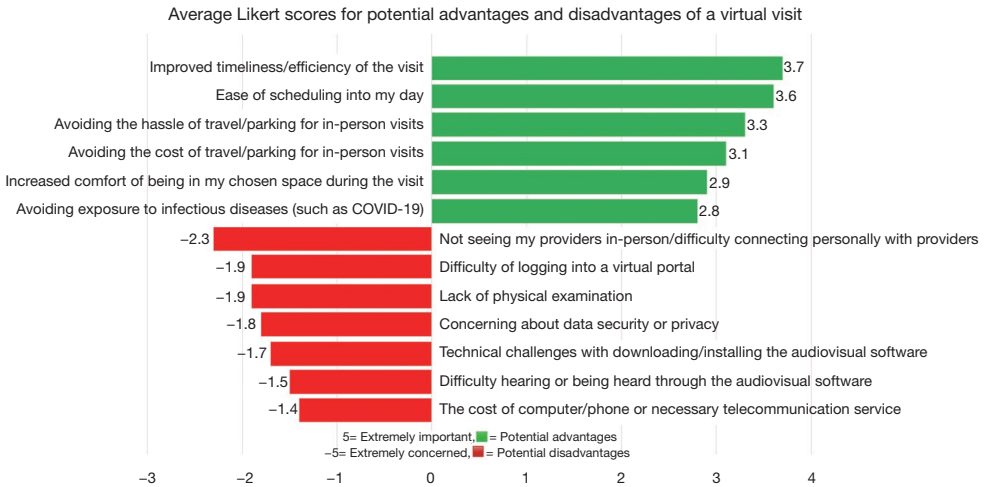

Figure 2 Potential advantages and disadvantages of a virtual multidisciplinary stone clinic based on average Likert scale. Green bars denote advantages and red bars denote disadvantages. The Likert scale is scored out of 5. COVID-19, coronavirus disease 2019.

agreed or strongly agreed while 4% of patients disagreed and 0 patients strongly disagreed. When asked if patients felt that the provider thoroughly discussed medication prevention options, 90% agreed or strongly agreed with the statement while 2% disagreed and no patients strongly disagreed. Regarding if patients felt that dietary prevention strategies were thoroughly discussed, 82% agreed or strongly agreed with the statement, and only 2% disagreed and strongly disagreed, respectively.

Overall, 83% of patients agreed or strongly agreed that the multidisciplinary stone clinic satisfied their stone related questions regarding treatment and prevention. Thirty-two percent of patients would recommend and 48% of patients would strongly recommend the multidisciplinary stone clinic to a friend or family member with kidney stones.

Discussion

We present our experience with creation and patient satisfaction of a completely virtual multidisciplinary kidney stone clinic. We found that the clinic is feasible to run monthly and that patients were satisfied with their experience. Benefits that were important to patients included improved efficiency and ability to schedule the clinic into their day, while there were few disadvantages most notably not being able to meet the provider in person. We utilized the telecommunication platform that our institution implemented during the COVID-19 pandemic which helped simplify creating the virtual clinic by reducing start-up costs and need for a complex virtual platform infrastructure.

Previous studies have demonstrated the benefits of a multidisciplinary approach to managing kidney stones. Utilization of shared medical appointments decreased wait times for appointments while increasing the number of patients seen per month (9). The subdivision of the different aspects of patient care by provider allowed for adequate time to discuss the intricacies of each by the most appropriate specialty and the pre-review and asynchronous messaging ensure alignment of the care plan. Similar to our study, patients had high satisfaction and would recommend the clinic to others (9). Multidisciplinary stone clinics have also been studied in the pediatric and underserved community populations which demonstrated decreased number of emergency department visits (10) and increased compliance with stone prevention strategies (11).

Virtual multidisciplinary clinics have been utilized in other specialties. Grogan *et al.* demonstrated the feasibility of converting an amyotrophic lateral sclerosis (ALS) multidisciplinary clinic to a virtual format with most patients opting for a telemedicine visit rather than waiting for the next available in person visit (12). Santoro *et al.* describe the experience of converting a multidisciplinary Down syndrome clinic to a virtual clinic. Similar to our experience, patients noted missing the personal connection of an in-person visit but appreciated the convenience of a virtual clinic (13). Polanco *et al.* described the experience of a multidisciplinary virtual pulmonary nodule clinic (14). These studies demonstrate that a virtual multidisciplinary clinic can be successfully employed in many different specialties.

The completely virtual format of the clinic can overcome limitations of a traditional clinic such as need for physical space and rooms which in turn can cut overhead costs. As the only academic hospital in the state of Oregon, patients can spend many hours traveling to the hospital for clinic visits. The virtual format eliminates not only the travel time but the economic impact of taking extended travel time off for the visit (15). In the few cases of patients that preferred an in-person encounter, they were offered visits in our separate in-person clinics

There are limitations to this study. Firstly, there is selection bias as patients who either had an overwhelming positive or negative experience are more likely to respond to the survey. Our survey questions were not validated. It is possible that patients who have technological limitations may be less likely to respond to an electronic mail survey are the same patients who have difficulty with utilizing the virtual platform which may not be accounted for in our survey results. There are limitations to the virtual clinic itself including limitations of technology literacy, coordinating timing of clinic appointments, multiple copays, and lack of physical exams.

Conclusions

A virtual multidisciplinary kidney stone clinic is a feasible clinic that can be implemented in multi-specialty centers with advantages of cost saving, flexibility, low start up requirements, and high patient satisfaction scores. There are few disadvantages to using the platform.

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Footnote

Reporting Checklist: The authors have completed the SURGE reporting checklist. Available at https://tau.amegroups.com/article/view/10.21037/tau-24-248/rc

Data Sharing Statement: Available at https://tau.amegroups.com/article/view/10.21037/tau-24-248/dss

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Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at https://tau.amegroups.com/article/view/10.21037/tau-24-248/coif). I.M. reports consulting fees from Sonomotion (reimbursement for DSMB work) and Cambria (advisory board). The other authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. The study was conducted in accordance with the Declaration of Helsinki (as revised in 2013). The study was submitted to the Oregon Health & Science University Institutional Review Board (IRB#00023593) and determined to be exempt due to the minimal risk to the participants. Informed consent was obtained from the participants of this study.

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