

# The role of telemedicine in gynecologic healthcare: A narrative review

***Abstract: This article offers a comprehensive narrative literature review on telemedicine use in gynecologic healthcare analyzing current telemedicine integration in the field and outlining innovative and best practices. Telemedicine use in contraceptive care, sexually transmitted infections, acute and chronic gynecologic conditions, and education are discussed. NPs are in a unique position to offer these services to patients in need of women's healthcare services. Barriers, facilitators, clinical implications, and future research are addressed.***

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**L**iterally meaning “healing at a distance,” telemedicine refers to the provision of remote clinical services. The rise of telemedicine services, coupled with the coronavirus disease 2019 (COVID-19) pandemic, has extended telehealth to populations that have typically shied away from said modalities such as women in need of gynecologic healthcare.

While often used interchangeably, “telehealth” and “telemedicine” refer to the use of information and communication technologies such as computers, the internet, and cell phones for health service delivery.<sup>1</sup> The World Health Organization describes telehealth as the “delivery of health care services, where patients and providers are separated by distance” and the Health Resources Services Administration defines telemedicine as remote clinical services.<sup>1,2</sup> Telehealth is defined more broadly, referring to the “use of electronic information telecommunications technologies to support long-distance clinical health care, patient and professional health-related education, public health, and health administration.”<sup>2</sup> Telehealth may include such technologies as telephones, fax machines, email, mobile applications, and remote patient monitoring. For the purposes of Medicaid reimbursement, telemedicine acts to enhance a patient’s health by utilizing “two-way, real-time interactive communication between the patient and the practitioner at the distant site.”<sup>3</sup> At a minimum, the Centers for Medicare & Medicaid Services (CMS) requires both an audio and video component to the communication.

NPs in primary care as well as NPs who specialize in women’s health may have initially struggled with ways to envision delivering reproductive healthcare by any means other than in-person visits. Pushed by the COVID-19 pandemic and the need for providers and patients to remain safe, new ways to envision gynecologic healthcare have become necessary. In doing so, providers have realized that the same technologies can be helpful for women in rural areas and with other vulnerable populations where access to care may have been limited.

One can examine telehealth by dividing studies into three main areas: those dealing with clinician-to-clinician communication, those dealing with clinician-to-patient communication, and those dealing with patient-to-digital-health-technology (email, fax, text, mobile applications, remote monitoring) interactions.<sup>4</sup> For the purposes of this comprehensive narrative review, the authors examined the literature on the role of telemedicine in women’s gynecologic provider-to-patient healthcare delivery, with the goal of providing a current snapshot of all forms of telemedicine creatively being employed in delivery of gynecologic healthcare today.

## ■ Methods

To gather data from the literature on the use of telemedicine in gynecologic healthcare, we conducted a search of databases including Academic Search Premier, Cumulative Index to Nursing and Allied Health Literature (CINAHL), Ovid, Nursing and Allied Health, and Google Scholar from 2015 through August 2020. Search terms included “telehealth,” “telemedicine,” “telemonitoring,”

**Keywords:** gynecologic health, reproductive health, telehealth, telemedicine, women’s healthcare

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“telepractice,” “telenursing,” or “telecare” with “women’s health,” “reproductive health,” “female health,” or “gynecologic health” to yield a total of 14,681 hits. Initial inclusion criteria of availability in English, inclusive of gynecologic care (not obstetric care), and use of audio and/or video component to the provider/patient interaction narrowed the search to 63 potential articles. Reference lists of retrieved studies were hand searched for other relevant citations. Articles were then narrowed to examine clinician-to-patient modalities utilizing “telemedicine” as defined by the CMS above.

After eliminating duplicates, 55 articles were reviewed in full text to see if they met inclusion criteria. Articles on medical abortion services were excluded from the review as the subject has been addressed fully elsewhere. Both qualitative and quantitative research, along with opinion and commentary pieces were looked at, as the purpose of the review was to locate all forms of telemedicine creatively being employed with patients for gynecologic health. The final set of articles retained for critical appraisal were then evaluated using the Johns Hopkins Nursing Evidence-Based Practice (JHNEBP) guidelines.<sup>5</sup> Articles were categorized by evidence level (I – V), where level I represented the most robust level of evidence and included well-conducted systematic reviews and meta-analyses of relevant randomized clinical trials (RCTs). Level II articles examined a single RCT; level III articles included well-designed studies without randomization; articles designated levels IV and V examined descriptive quantitative and qualitative studies. Quality of evidence was graded as high (A), good (B), or low/major flaws (C).<sup>5</sup> Thirty-three articles across the evidence levels of II – V were retained for inclusion, with evidence quality ratings in the high (A) or good (B) range (see *Numbers of grade A/B papers by evidence level*).

### ■ Current use of telemedicine in gynecologic healthcare

Telemedicine’s use in reproductive healthcare has shown promise in offering innovative solutions to unmet health needs, particularly in areas with few healthcare providers. DeNicola et al. conducted a systematic review looking at high-quality articles on telehealth interventions to improve obstetric and gynecologic health outcomes, using a broad definition of telehealth—including call or text—and examined evidence for the use of mobile applications, wearable devices, and synchronous/asynchronous communication.<sup>6</sup> Thompson et al. additionally conducted a

scoping review using a broad definition of telehealth, and found many studies focused on mobile applications or the use of text message reminders.<sup>7</sup> The interventions did appear to increase rates of contraception continuation. Tolu and colleagues also conducted a scoping review aimed to identify guidelines and consensus statements on provision of reproductive health services during the pandemic.<sup>8</sup> Telehealth was one recommendation for delivering care while minimizing exposure. The aim of this review was to look more narrowly at interventions inclusive of an audio or video component for synchronous communication.

### ■ Results

Previous research employing a telemedicine modality utilizing audio or video were examined for the purpose of compiling innovative ways to support women with reproductive healthcare needs. The interventions employed across studies included services for contraception, sexually transmitted infections (STIs), gynecologic complaints, and preventive teaching.

#### *Telemedicine and contraceptive care*

Contraceptive services were one of the simplest to envision doing remotely. Wilkenson et al. emphasized that the safe prescription of contraception lies in the patient history, and pelvic and breast exams are not routinely needed for this purpose.<sup>9</sup> Through a video platform, providers can counsel on contraceptive methods and sexual risk reduction, and can prescribe both regular and emergency contraception. If a patient chooses a long-acting reversible contraceptive (LARC) device, a follow-up in-person appointment can be made for insertion. Providers uncertain about starting contraception remotely can ask the patient to do a home pregnancy test. Nanda et al. concurred about the usefulness of telemedicine for contraceptive counseling and shared decision-making and management of adverse reactions of contraceptives.<sup>10</sup> Authors argued for optimized access for clients, with multimonth refills, advance prescriptions for emergency contraception, and easy access to LARC insertions. Sundstrom et al. advocated that interventions were needed to situate contraception into a woman’s overall health and well-being and found access to contraception counseling and birth control prescriptions improved via telemedicine.<sup>11</sup>

Williams et al. specifically promoted access to contraceptives for adolescents.<sup>12</sup> In adolescents, the low use of contraceptives is often due to the need for two



visits (provider plus pharmacy), lack of transportation and/or money, or the desire to keep sexual behavior and contraceptive use confidential. Authors concede data are limited on the ability of adolescents to self-screen for medical contraindications if birth control was made available over the counter. Telemedicine provides benefits such as ease of access, confidentiality, and ease of obtaining appointments.

Dorland et al. and Jain et al. examined and evaluated online contraceptive services.<sup>13,14</sup> Video chat was required by some companies depending on state laws. Of 13 services evaluated by Dorland et al., 7 required a BP reading prior to prescribing.<sup>13</sup> Jain et al. appraised nine vendors with 63 visits using seven standardized patients with relative and absolute contraindications to combined oral contraception.<sup>14</sup> Two vendors provided a video call, two a text message, two a phone call, and three vendors provided no provider interaction. Authors found adherence to medical eligibility criteria to be 93%, about equal to traditional in-person visits. One barrier to obtaining prescriptions from online vendors is that most only prescribe to women 18 years of age or older, hindering access for adolescents.<sup>12</sup>

### Telemedicine and care for STIs

Chabot et al. interviewed stakeholders involved in a novel testing option for STIs.<sup>15</sup> Risks for an STI were evaluated in an online assessment followed by specimen collection at a lab. Nurses followed up with anyone who tested positive. Stakeholders felt the service reduced waiting times, enhanced privacy and confidentiality, appealed to tech-savvy populations, and provided patient-centered technology to empower clients to seek testing. The program especially targeted youth and the men who have sex with men (MSM) population. It was also helpful for the “worried well” group, which includes those who may be anxious about infection but have minimal risk. Providers were hopeful that once patients felt comfortable with them as providers via video, they would be more motivated to come in face-to-face for a full exam. Lindberg et al. advocated mailing STI kits following a video appointment to expand access to testing.<sup>16</sup> However, they noted service gaps for the homeless, uninsured, and recent immigrants. Some family planning centers provided history taking and screening through telemedicine while patients picked up kits for self-swabbing at home. A drive-through was provided for drop-off.<sup>17</sup> Others noted that STI screening services were continued face to face, but transitioned to

**Numbers of grade A/B papers by evidence level**

Levels of evidence	Number of grade A/B papers	Corresponding article citation numbers
Level I	0	-
Level II	6	27, 30, 31, 33, 35, 36
Level III	16	6, 11, 13, 14, 15, 18, 19, 23, 24, 25, 28, 29, 32, 34, 37, 38
Level IV	6	9, 10, 16, 17, 20, 21
Level V	5	7, 8, 12, 22, 26

a nurse for screening and counseling.<sup>18</sup> Conserve et al. conducted a systematic review of HIV testing.<sup>19</sup> While most interventions included text message reminders, they resulted in an increase in the number of individuals coming in for testing. McCoy and Packel discussed expanding access to HIV testing and preexposure prophylaxis (PrEP) services by creating a mobile game to increase motivation; points earned by playing could be redeemed for prizes during in-person clinic visits.<sup>20</sup>

### Telemedicine in acute and chronic gynecologic conditions

Several authors discussed ways to use telemedicine interventions in acute and chronic gynecologic conditions. Video calls were used to screen and prioritize acute cases where patients needed to be seen in the office from lower priority concerns that could wait.<sup>21</sup> Consults for problems like dysmenorrhea, abnormal uterine bleeding, chronic pelvic pain, and painful bladder symptoms could be initiated through video chat where a thorough history was obtained and labs could be ordered prior to a visit. Authors suggest that video chat increases patient satisfaction, lowers anxiety, and does not alter treatment outcomes or complications.<sup>18,22</sup> Lee and Hitt also discuss clinical applications of using telemedicine for well woman visits for preconception care, infertility history and genetic evaluation, mental health counseling, review of lab work, and when a Pap smear is not indicated.<sup>23</sup> Lowery adds that follow-up appointments work well via video appointment as does counseling on lifestyle measures.<sup>24</sup>

Telemedicine also has applications for patients suffering from urinary issues. Grimes et al. note that all counseling for pessary management and urinary retention can be done via telemedicine.<sup>22</sup> Patient diaries for voiding symptoms can be used and clinical guidelines followed for best management. Murray et al. conducted

a retrospective chart review comparing antibiotic prescribing, follow-up rates, and clinical outcomes between face-to-face and telemedicine visits for urinary tract infection complaints.<sup>25</sup> Those seen face to face were more likely to have a urine dipstick and culture sent, but no difference was seen in rate of antibiotic prescribing, follow-up, or treatment failure. Schlittenhardt et al. described how telemedicine improved follow-up rates, effectiveness of treatment plans, patient satisfaction, and healthcare team support for patients with urinary incontinence issues.<sup>26</sup> Previously, the provider traveled 90 miles for monthly appointments in a rural area, making

were found, offering reliable guidance in management when a specialist is not immediately available.

### **Telemedicine in gynecologic patient education**

A final area deemed essential by most providers of family planning services is education and prevention. Yoost et al. used real-time interactive telecommunications for eight 60-minute sessions for female students at two high schools.<sup>34,35</sup> The programs addressed knowledge, myths, and misconceptions about reproductive health.<sup>35</sup> Following the sessions, the rate of human papillomavirus vaccination rose from 38% to 70%.<sup>34,35</sup> The following

year, the team led by Singh et al. returned to the same high schools and incorporated synchronous video sessions after school for 7 weeks, including both male and female students.<sup>36</sup> Knowledge was assessed pre- and posttest as well as 6 months later.

Both an increase in birth control and STI knowledge was seen at the 6-month test. A larger number of students reported using condoms, but the number was not statistically significant.

## **Discussion**

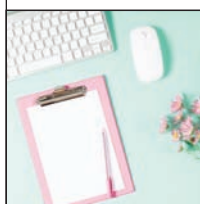
### **Benefits of telemedicine use in gynecologic healthcare**

Telemedicine comes with inherent benefits for its users. Many women, particularly those in low-income groups or living in rural areas, delay or forgo necessary healthcare due to problems obtaining transportation or childcare. In small towns, patients stated they faced embarrassment or confidentiality concerns when visiting a clinic that was known by the community.<sup>34</sup> Rural communities often lack sufficient numbers of obstetricians/gynecologists and patients must travel far to see specialists. Those with low income, lower levels of education, and low health literacy were the least likely to obtain cervical cancer screening.<sup>29</sup>

Sundstrom et al. conducted interviews with women in rural South Carolina.<sup>11,37</sup> These women found telehealth to be an acceptable model for receiving healthcare. The women reported that accessing telehealth services would be convenient, reduce required travel, save them money in gas, and increase knowledge of contraceptive options.

### **Barriers to telemedicine use**

At the same time, multiple barriers to the use of telemedicine still exist with respect to gynecologic



**Questions remain regarding the inequity in access to both the technology and technologic knowledge to engage in telemedicine visits.**

appointment availability insufficient and inconvenient. Medication assessment, reinforcement of behavioral therapy, and ongoing education all lent themselves well to video follow-up.

One study described the use of telemedicine for initial consult appointments for women needing to undergo breast reconstruction following cancer treatment. Due to rural location, financial burden, and lack of access to plastic surgeons, many women do not undergo reconstructive surgery. Use of telemedicine for initial consultation is appropriate to screen potential candidates and provide options for care.<sup>27</sup>

Telecolposcopy was one specific intervention used both in rural areas of the US and in low-resource countries. Examinations can be done in real time as the colposcope can be fit with a camera.<sup>28</sup> Experts in a remote area can dictate if biopsy may or may not be needed. Real-time images can be transmitted via camera directing treatment strategies or stored for later follow-up. Diagnostic outcomes were found to be similar to exams done by specialists on site.<sup>29-31</sup> In low-resource countries where Pap smear is unavailable, nurses and midwives are taught to do a visual inspection of the cervix with acetic acid. Smartphones took still photos which were transmitted to experts for review. A high percentage of the images were found to be sufficient for diagnosis. Those at risk were provided cryotherapy.<sup>30-32</sup> Taghavi et al. compared the accuracy of live versus static images for detecting cervical intraepithelial neoplasia grade 2 or greater (CIN2+) using a Swede score.<sup>33</sup> No differences

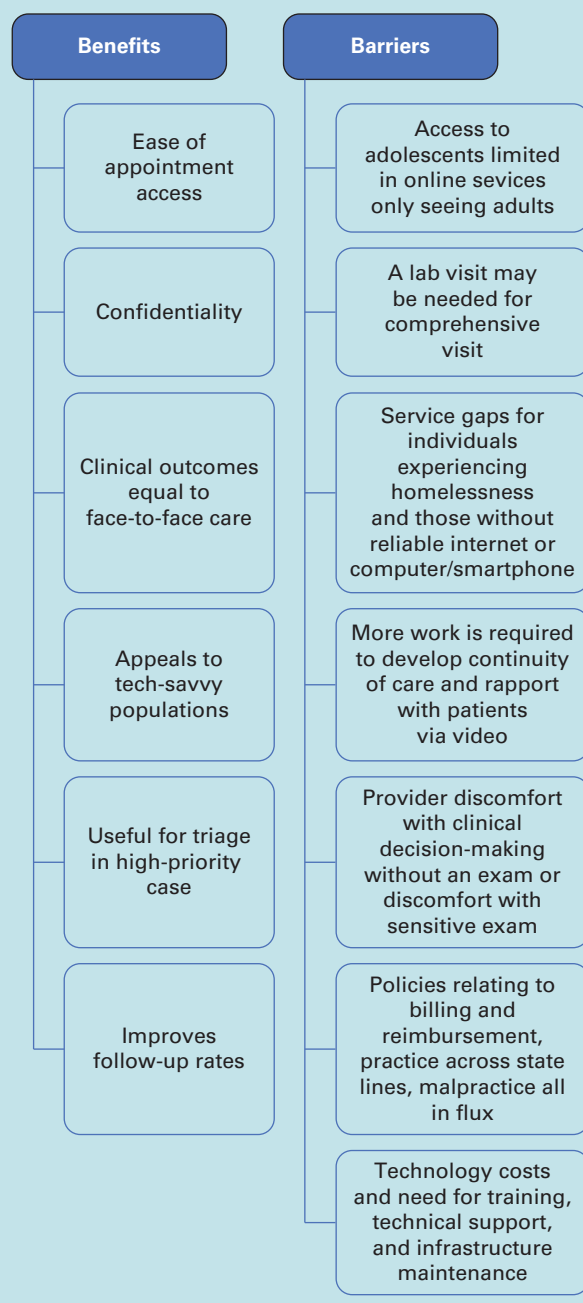
healthcare. The women in Sundstrom et al.'s study cited confidentiality concerns and the desire for a patient-provider relationship that included personalized service from a "real" medical provider.<sup>11,37</sup> The importance of relationship-centered care was emphasized, including communication and approachability. Weigel et al. echoed the same concern with patients, stating it was difficult to establish rapport through video, that care was less personal, and the quality of healthcare was perceived to be lower.<sup>38</sup> Providers expressed concern that the continuity of care would be disrupted (as patients saw providers online other than their primary provider). Barney et al. cited several concerns regarding telemedicine visits.<sup>18</sup> Despite advances, challenges with technology remain a large concern. Additionally, the cost to support the infrastructure needed for Health Insurance Portability and Accountability Act (HIPAA) compliant care was large. Questions remain regarding the inequity in access to both the technology and technologic knowledge to engage in telemedicine visits. Others questioned the effect of telemedicine on the patient-provider relationship. Concerns exist for those who might live in crowded households, including confidentiality and safety issues that could inhibit the ability of patients to disclose complaints. Some providers were uncomfortable with clinical decision-making in the absence of a full physical exam and were uncomfortable about asking patients to show sensitive body images on camera.

Brakman et al. and Lowery highlight the logistical restrictions of providers practicing across state lines, the ongoing cost of technology, costs of training and technical support, malpractice concerns, and issues with reimbursement and billing.<sup>24,34</sup> While restrictions have been relaxed during the COVID-19 pandemic, it is unclear how long they will remain in place.<sup>3</sup> Both benefits and barriers exist to providing gynecologic healthcare via telemedicine (see *Benefits and barriers to telemedicine in gynecologic healthcare*).

## Conclusion

Despite the many barriers to telemedicine, literature has shown that benefits of receiving gynecologic care were well received by women who may have otherwise been unable to receive screening or important gynecologic services. Continuation of contraceptive care, screening for STIs, care for nonacute gynecologic conditions, and necessary education for teens and young adults can be creatively employed when distance

### Benefits and barriers to telemedicine in gynecologic healthcare



hampers face-to-face interactions. Overall, services such as counseling, obtaining medical histories, involving patients in shared decision-making, conducting risk assessments, and providing medication adverse reaction management have been shown to work well in a telemedicine modality.

## ■ Implications for practice, education, research, and policy


Telemedicine has seen rapid progress in use and acceptance over the past year. With the recent and swift uptake of telemedicine by communities across the nation and world, it seems logical that telemedicine may be here to stay as a legitimate, covered modality that providers can employ to see their patients.<sup>39</sup>

Resources for the delivery of telemedicine are growing. Federal and state governments have taken steps to provide guidance for healthcare providers and their patients desiring to use telemedicine modalities. Examples include directives by the Department of Health and Human Services (HHS) Office for Civil Rights (OCR) for providers using nonpublic facing apps, guidance by the CDC on telehealth delivery for systems, practices, and providers, and the CMS guidance to support telemedicine care delivery to patients enrolled in Medicare, Medicaid, and the Children's Health Insurance Program.<sup>40-42</sup> Telehealth coverage has also temporarily expanded to include increased indications for remote patient monitoring, digital health services for new and existing patients, rural patients across state lines, specified types of emergency care, care within nursing facilities and therapy visits, among others.<sup>43</sup>

As the literature has demonstrated, telemedical care can be especially useful for populations that are rural without local gynecologic providers, specifically around providing family planning care and for addressing nonemergent acute gynecologic issues. For NPs providing women's health services in primary or specialty care, provision for continuity of care both during and after the COVID-19 pandemic are in place. Creative solutions for making appointments more accessible and streamlined are occurring. The reach to vulnerable populations who may not otherwise have access to care is possible. Continuing education to teens and young adults is plausible virtually as we gain experience in new platforms and creative pedagogy.

Telehealth has given us another option for quality, cost-effective healthcare. Barriers that continue to hinder full initiation include a lack of funding to develop programs, a lack of infrastructure, competing health system priorities, and a lack of legislation for permanent use.<sup>1</sup> Continued advocacy and involvement in policy is essential for telemedicine services to continue postpandemic.

Given the recent shift to telemedicine from face-to-face visits throughout the healthcare system, the

continued exploration of ways to increase the use, feasibility, and acceptability of telemedicine in the delivery of gynecologic healthcare is warranted. Future work exploring barriers to infrastructure, program development, and permanent reimbursement for telemedicine visits are also needed to maintain telemedicine viability. 

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