Table F-8. Outpatient evidence table: patient characteristics

| **Author, Year**(See Appendix C for full citation) | **Number Analyzeda** | **Population** | **Referring Providers Specialty/Type** | **Consulting Provider Specialty/Type** | **Patient Present?** | **Patient Setting** | **Modalities of Telehealth Consultation Intervention** | **Timing** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Angstman, 2009 | 728A: 500B: 228 | Adults  | General practitioners | Not specified  | A: YesB: No  | Outpatient | Electronic health documentation, test results | Mixed |
| Arora, 2011 | 407A: 146B: 261 | Adults between 18-65 with HCV  | Primary care | Hepatology, infectious diseases, psychiatry, and pharmacology  | No | Outpatient | Videoconference | Real-time |
| Bagayoko, 2014 | 211A: NRB: NR | Rural | NR | Obstetrics and cardiology | Yes | Outpatient | EKG and obstetric ultrasounds transmitted via laptops with low bandwidth internet connection | Asynchronous |
| Baig, 2016 | UnclearA: UnclearB: Unclear | Adults | Primary care physician | Sleep specialist | No | Outpatient | E-Consult | Asynchronous |
| Basudev, 2016 | 167A: 88B: 79 | Adult | Primary care | Diabetes specialist | No | Outpatient | NR | Real-time |
| Bernstein, 2010 | 2,663 A: 2,196B: 285C: 182 | People age 17 to 70+, mean age 59.1 years. 56% male. 65% Caucasian, 28% aboriginal. 50% diabetic nephropathy, though higher rates of DN in local communities. 5-year mortality 56% | Primary care | Nephrology team | No | Outpatient | Record/flowsheet review | Real-time  |
| Beswick, 2016 | 41A: 26B: 15 | Adults | Nurse and speech pathologist | Head and neck surgeon | Yes | Outpatient | Audiovisual teleconference | Real-time |
| Bezalel, 2015 | 3,065A: 1,557 new patientsB: 1,508 new patientsn for established patients NR | Adults (VA patients) | NR | Dermatologist | No | Outpatient | Unclear/NR | Asynchronous |
| Blackwell, 1997 | 579A:315B: 264; 24 received telehealth | NR | Emergency department director | Ophthalmology specialist | Yes | ED | Videoconference | Real-time |
| Boman, 2014 | 38A: 19B: 19 | Adults | General practitioner | Cardiologist | Yes | Outpatient | Store and forward (history, ECG) and "bidirectional communication" (likely videoconference) | Mixed |
| Britt, 2006 | NR | Rural; Women with high-risk pregnancies | NR | Maternal-fetal medicine specialists and associated residents | Unclear | Inpatient for transports and hospital daysOutpatient for consultations | NR - videoconference, presumably | Real-time |
| Brown-Connolly, 2002 | 741A: NRB: NR | Adults and Pediatrics | Primary care | Various | Yes | Outpatient | NR | Real-time |
| Burns, 2017 | 82A: 39B: 43 | Adult | Regional speech pathologist | Hospital speech pathologist | Yes | Outpatient | Videoconference | Real-time |
| Byamba, 2015 | 450A: 229B: 221 | Rural patients | General practitioner | Dermatologist | No | Outpatient | Clinical notes and pictures | Asynchronous |
| Carallo, 2015 | 312A: 208B: 104 | Adults with type II diabetes, without major cardiovascular disease | Primary care | Diabetes | Unclear | Outpatient | Electronic health record | Asynchronous |
| Carter, 2017 | 252A: 173B: 79 | Adults | Primary care physician | Dermatology | Yes | Outpatient | Electronic health record | Asynchronous |
| Chan, 2015 | 206A: 117B: 89 | rural | General physician | Oncologist | Yes | Outpatient | Videoconference | Real-time |
| Chu, 2015 | 97A: NRB: NR | Veterans | Primary care | Urology | Yes | Outpatient | Videoconference | Real-time |
| Chua, 2001 | 141A: 65B: 76 | Adult | Primary care physician | Neurologist | Yes | Outpatient | Videoconference | Real-time |
| Collins, 2004; Bowns, 2006 | 208A: 97 B: 111 | Adults 16 or older, with no diagnoses of dermatological or mental health problems | General practitioner  | Dermatology  | No | Outpatient | Not specified | Asynchronous |
| Crossland, 2016 | 1,024 A: 577 B: 447 | Adults | General practitioners | Ophthalmologists | Unclear | Outpatient | Teleconferences and/or email | Unclear |
| Datta, 2015 | 391A: 196B: 195 | Adults | Primary care physician | Dermatologist |   | Outpatient | Records and images | Asynchronous |
| Davis, 2011 | 360A: 200B:160 | Veterans (adults) 75% white; >80% male | Not specified  | Nurse, pharmacist, psychiatrist  | No | Outpatient  | Videoconference | Real-time |
| Davison, 2004 | 112A: 50B: 62 | Adults | Chest medicine lung cancer clinical nurse | Thoracic surgeon and radiologist | No | Outpatient | Video | Real-time |
| De Luca, 2005 | 3,934A: 1,985B: 1,949 | Adults  | Primary care | Cardiologist | Yes | Outpatient | Internet based digital network | Asynchronous |
| Doolittle, 1997 | NRA: 81B: NRC: 103 | NR | NR | Oncologist | Yes | Outpatient | Videoconference | Real-time |
| Dowie, 2007 | 504A: 387B: 117 | Pregnant women and pediatric | Unclear | Cardiologist | Yes and no | Outpatient | Videoconference | Mixed |
| Eminovic, 2009, 2010 | 605A: 304B: 301 | Pediatric and adult patients | General practitioner | Dermatology | Yes | Outpatient | Digital camera and website | Asynchronous |
| Endean, 2001 | 32A: 32B: 32 | Adults | NR | Vascular specialist | Yes | Outpatient | Videoconference | Real-time |
| Ferrandiz, 2007 | 134A: NRB: NR | Adults | Primary care | Dermatologist | Unclear | Outpatient | Digital pictures inserted into Word document containing other clinical information. Document sent via intranet to email account of skin cancer clinic. | Asynchronous |
| Fortney, 2013 | 364A: 185B: 179 | Adults, majority low income, rural | Primary care | Pharmacy, psychology, psychiatry, care management | Sometimes | Outpatient | Telephone, videoconference | Real-time  |
| Fortney, 2007 | 395A: 218B: 177 | Adults, majority older white men | Primary care | Psychiatry | Yes | Outpatient | Phone, medical records, video | Real-time |
| Fortney, 2011 | 395A: 218B: 177 | Adults | Primary care provider | Psychiatrists | Yes | Outpatient | Mixed (interactive video, telephone) | Real-time |
| Fortney, 2015 | 265A: 132B: 133 | Veterans, mostly male | PTSD providers in CBOCs were recruited as were patients with PTSD diagnoses | Telepsychiatrists, telephone nurse care manager  | Yes | Outpatient | Telephone for care managers and pharmacist. Psychotherapy and psychiatric consultation via videoconference.Care managers also used web based decision support system. | Real-time |
| Fox, 2007 | 706A: 173B: 257C: 276 | Adolescents in state correctional facilities | General nurse  | Multiple | Yes | Other (correctional facility) | Videoconference | Real-time |
| Frank, 2015 | 322,059A: 299,981 B: 22,454 | Adult VA patients with pain that have an established primary care provider at the VA | Primary care provider | Pain specialist | No | Outpatient | Videoconference | Real-time |
| Gattas, 2001 | 62A: 23 (8 providers, 8 counselors, 5 patients) B: 44 (16 providers, 16 counselors, 12 patients)  | NR | Genetic counselor | Genetics | Yes | Outpatient | Videoconference | Real-time |
| Gilmour, 1998 | 126A: NRB: NR | Pediatrics and adults | General practitioner | Dermatologist | Yes | Outpatient | Videoconference | Real-time |
| Harno, 2000 | 292A: 85B: 207 | Adults | Primary care | Various hospital outpatient specialties | No | Outpatient | Electronic referral system; referrals transferred by intranet to electronic mail boxes in the hospital information system; video-networking in separate study. | Asynchronous |
| Harno, 2001 | 225A: 168B: 57 | Adults | Unclear | Orthopedics | Yes | Outpatient | Email Videoconference | Real-time |
| Haukipuro same pts as Ohinmaa and Vuolio, 2000 | 145A: 69B: 76 | Adult | General practitioner | Orthopedics | Yes | Outpatient | Videoconference  | Real-time |
| Herce, 2011 | 2,647A: 2,550B: 97 | Adult | Primary care dentist | Oral surgeon | No | Outpatient | Digital images | Asynchronous |
| Hsiao, 2008 | 169A: 77B: 92 | Veterans seen in the San Francisco VA or outlying VA clinics | Primary care provider | Dermatology | No | Outpatient | Electronic consult through a shared medical record system. | Asynchronous |
| Izquierdo, 2009 | 41A: 18B: 23 | Kindergarten through eighth grade | School nurse | Diabetes nurse practitioner | Yes | Outpatient (School) | Videoconference  | Real-time |
| Jaatinen, 2002 | 78A: 24B: 54 | Adults | General practitioners | Internists, surgeons, geriatricians | Unclear | Outpatient | Web-based system | Asynchronous |
| Jacklin, 2003Same study as Wallace 2002, 2004 | 1,939A: 971B: 968 | Not clearly defined in this paper, refer to another previous paper, essentially any patient that met inclusion criteria not defined in this paper, that needed a consultation | General practitioner | Not specified, seems like any consultation | Yes | Outpatient | Videoconference | Real-time |
| Jacobs, 2015 | 794A: 312B: 482 | All patients who visited GP with trauma related to the musculoskeletal system | General practitioner | Radiologist and surgeon | No | ED/EMS: Urgent visit to GP office acting as ED | Data transfer: digital x-rays | Asynchronous |
| Jong, 2004 | 12A: 2B: 4 C: 6 For cost outcomes, patient sample size NR | NR | Primary care | Rheumatology | Not always | Outpatient | Videoconference | Real-time |
| Jue, 2017 | 296A: Same patientsB: 296 | Adults | Nurse practitioner | Surgical oncologist | Yes | Outpatient | Videoconference | Real-time |
| Kobza, 2000 | 196A: 120B: 76 | Adults | Home health nurse | Wound care specialist | Yes | Home | Videoconference | Real-time |
| Krier, 2011 | 34A: 19B: 15 | Adults | Gastroenterology fellows | Gastroenterology and endoscopy specialist | Yes | Outpatient | Videoconference | Real-time |
| Krupinski, 2004 | 100A: 50 B: 50  | Rural patients referred for dermatology consult | Primary care provider | Dermatology | No | Outpatient | Records and images | Asynchronous |
| Kunkler, 2007 | 473A: 195B: 278 | Predominantly rural | NR | Consultant breast surgeons, medical and clinical oncologists, radiologists, pathologists, and breast care nurses | No | Outpatient | Viewing of mammograms, CT scans and pathology as well as videoconferencing | Real-time |
| Lamminen, 2001 | 191A: 85 B: 64 C: 24 D:18  | NR | General practitioner  | Ophthalmology and dermatology | Yes | Outpatient | Videoconference  | Real-time |
| Lee, 2014 | 3,081A: NRB: NR | Adults | Primary care | Osteology | No | Outpatient | Laboratory data, clinical risk factors, prior treatment, electronic notes | Asynchronous  |
| Lim, 2012 | 300A: 100B: 200 | Pediatric/adults | General practitioner | Dermatologist | No | Outpatient | Secure server | Asynchronous |
| Loane, 2000 | 204A: 102B: 102 VideoC: 96 (96 of the 102 were also store and forward) | Pediatric and adults | Primary care physician | Dermatologist | Yes | Outpatient | Video | Mixed |
| Loane, 1999 | 164A: 103B: 61 | Adults and children (range: 3 months to 84 years; mean age 42 years) | General practitioners | Dermatologist | Yes | Outpatient | Low-cost videoconferencing units (VC7000, British Telecom)  | Real-time |
| Loane, 2001 | 203A: 94B: 109 | Adults and children (range: 3 months to 84 years; mean age 42 years) | General practitioners | Dermatologist | Yes | Outpatient | Low-cost personal computers with videoconferencing; video cameras to transmit close-up images of skin lesions. | Real-time |
| Long, 2014 | NRA: NRB: NR | Maternal Medicaid population | Community providers | Maternal fetal medicine specialists (maternal fetal medicine nurses staff 24/7 call center) | Yes for some ultrasounds, but not clear on how many. | Outpatient | Six-fold telehealth model - includes education and training for providers, 24/7 call center for support, telehealth network, clinical research, case management and evidence based guidelines and protocols.  | Real-time |
| Mahendran, 2005 | 163A: 163B: 163; same as group A | Any patient with suspicious skin lesion presenting to their GP during a specified 18 months period. | General practitioner | Dermatology | No | Outpatient | Store and forward: records | Asynchronous |
| McCrossan, 2012 | 66A: NRB: NR | Pregnant women, 31.3 years (range = 17.1 to 40.8 years) Neonates, 23 weeks (range = 21 to 26 weeks) | NR | Fetal cardiologist | Yes | Outpatient | Mixed | Real-time |
| Moreno-Ramirez, 2009 | 4,018A: 2,009B: 2,009 | NR | General practitioner | Dermatologist | Yes | Outpatient | Digital Camera andIntranet | Asynchronous |
| Mulgrew, 2011 | 25 A: 15B: 10 | Pediatric | Primary care physician | Pediatrician specializing in weight management | Yes | Outpatient | Videoconference | Real-time |
| Nickenig, 2008 | 857A: 772B: 85 | NR | Dentist | Implant Specialist | No | Outpatient | Videoconference | Real-time |
| Nikkanen, 2008 | 101 A: 101B: 101 (same as A) | Adults | Diabetes | Diabetes |   | Outpatient | Videoconference, electronic records, electronic stethoscope | Real-time |
| Nordal, 2001 | 121A1: NRA2: NR | Adult men and women (aged 17-82 years) | University Hospital of Tromsø | Dermatologist | Yes | Outpatient | Videoconference | Real-time |
| OhinmaaSame patients as Vuolio and Haukipuro, 2002 | 145A: 69B: 76 | Adults | General practitioner | Orthopedics | Yes | Outpatient | Videoconference  | Real-time |
| Pak, 2009; Pak, 2007 | 508A: 236B: 272 | Adult (≥18 years old) who were referred from the Department of Defense | Clinician | Dermatologist | No | Outpatient | Store and forward: records | Asynchronous |
| Piette, 2017 | 103A: 50B: 53 | Adults | General practitioner | Dermatology | No | Outpatient | Email | Asynchronous |
| Rossaro, 2013 | 80A: 40B: 40 | Adults | Primary care | Hepatologist | No  | Outpatient | Videoconference | Real-time |
| Salami, 2015 | 116A: 68B: 48 | Adult men  | Oncology,gastroenterology,hepatology, surgery, other | Radiology, gastroenterology, hepatology, transplantation, surgical oncology, medical oncology, radiology  | Not specified  | Outpatient | VA electronic medical record, audiovisual teleconferencing  | Real-time |
| Salazar-Fernandez, 2012 | 1,052A: 710B: 342 | Adults | Dentist | Oral and maxillofacial  | Yes | Outpatient | Store and forward | Asynchronous |
| Santamaria, 2004 | 93A: 43B: 50 | Adults | Wound care nurses | Wound care consultant | No  | Outpatient | Imaging system | Asynchronous |
| Scuffham, 2002 | 25A: NRB: NRC: NR | Adults | General dentist | Specialist dentist | Yes | Outpatient | Videoconference | Real-time |
| Sharma, 2003 | 229A: 195B: 34 | Adults aged 25-89 | NR | Staff echocardiographer, pediatric cardiology fellow | Yes | Primary care center | Live screening of echocardiogram transmitted via data transmission | Real-time |
| Smith, 2002 | 387 A: NRB: NR | Children | Pediatricians | Physicians in subspecialty fields including burns, cardiology, dermatology, diabetes, endocrinology, neurology, nephrology, oncology, orthopedics and respiratory medicine | Unclear | Outpatient | Videoconference, email, fax, telephone | Real-time |
| Smith-Strom, 2018 | 182A: 88B: 94 | Adult | Community nurses | Specialist nurse | Yes | Outpatient | Web-based record and mobile phone | Asynchronous |
| Specht, 2001 | NRA: NRB: NR | Adults in a long term care facility. | Primary nurse and/or skin care nurse at the LTC | Chronic wound nurse expert | Yes | Long term care facility | Video using Teledoc 5000 | Asynchronous |
| Stalfors, 2003 | 104 (completed patient satisfaction survey)A: 46 (39)B: 58 (45) | Not specified  | Ear nose and throat surgeon  | Multiple specialties | Yes | Outpatient | Videoconference, still images | Real-time |
| Stalfors, 2005 | 118A: 50B: 68 | Patients with head and neck cancers that are discussed in the multidisciplinary team meeting | NR | Multidisciplinary team | Yes  | Outpatient | Videoconference | Real-time |
| Stern, 2014 | Total wounds analyzed: 259 among 137 LTC residents | Long term care facilities with >100 beds in Toronto Central and Central LHINs with pressure ulcer prevalence >5.5%  | Unclear | Skin and wound care, plastic surgeon, occupational therapist, chiropodist | Unclear  | Long term care facility | Email, telephone, data | Asynchronous  |
| Strymish, 2017 | 480A: 195B: 285 | Adults | NR | Specialist | No | Unclear | e-consult | Asynchronous |
| Taylor, 2007 | 495A: 294B: 201 | Adults | Primary care physician | Expert technical graders | No | Outpatient | Digital images | Asynchronous |
| Thaker, 2013 | NRA: NRB: 147 | Not specified  | Not specified | Oncologist | Yes, local physician not always present | Outpatient | Videoconference | Real-time  |
| Tsitlakidis, 2005 | 38A: NRB: NR | Children and adults (majority of patients were between 20 and 30 years of age) | Officers with medical background, conscripts with medical background (not yet specialized), flight surgeons, general medical staff | NR | Yes | Outpatient | PC-based ISDN videoconferencing | Real-time  |
| Tuulonen, 1999 | 70A: 41B: 29 | Adults | General practitioner | Ophthalmology | Yes | Outpatient | Videoconference  | Real-time  |
| van der Pol, 2010 | 90 A: NRB: NR | Adults | Anesthesiologist or surgeon | Endoscopy specialist | Yes | Outpatient | Videoconference | Real-time  |
| Van Gelder, 2017 | 3,004A: 1,727B: 1,277 | Adult | General practitioner | Nephrologist | No | Outpatient | Electronic health record | Asynchronous |
| VuolioSame patients as Ohinmaa and Hakipuro, 2003 | 145A: 69B: 76 | Adults | General practitioner | Orthopedics | Yes | Outpatient | Videoconference  | Real-time  |
| Wallace, 2002 | 1,939 A: 971B: 968155 post-randomization exclusions | Adults & Pediatrics in London (urban) and Shrewsbury (rural) | General practitioner  | Multiple: orthopedics, urology, ENT, gastroenterology and other medical specialists | Present | Outpatient(Primary Care) | PC-based video | Real-time  |
| Wallace, 2004 | 1,939 A: 971B: 968 | Not specified  | General practice | Multiple specialties | Yes | Outpatient | Videoconference | Real-time  |
| Whited, 2002 | 275A: 140B: 135 | Adults | General medicine, internal medicine, women's health | Dermatology | Unclear  | Outpatient | Mixed (images, standardized history, standardized consult) | Asynchronous |
| Whited, 2003 | 275A: 140B: 135 | Adults | Primary care physician | Dermatologist | No | Outpatient | Digital records | Asynchronous |
| Whited, 2004 | Clinicians: 91A: 53B: 38Patients: 275A: 140B: 135 | Adults | Primary care | Dermatology | Yes | Outpatient | Mixed (images, standardized history, standardized consult) | Asynchronous |
| Whited, 2013a, 2013b | Randomized: 391A: 196B: 195Analyzed: 261A: 136B: 125 | Adults, 97.5% men | Primary care | Dermatology | No | Outpatient | Store and forward electronic medical record, digital images, text | Asynchronous |
| Wilson, 2005 | 6,978A: 2,910B: 4,068 | Adults | Primary care physician | Image reading Center | No | Outpatient | Digital images | Asynchronous |
| Xu, 2008 | 265A: 177B: 88 | Pediatric | Pediatricians and other physicians | ENT specialists | No | Outpatient | Videoconference | Real-time |
| Young, 2014 | 1,201A: 514B: 687 | Adult inmates | Correctional nurse | Infectious disease physician | Yes | Prison | Videoconference | Real-time |
| Zahlmann, 2002 | 62A: 20B: 42 | Adults | General practitioner | Ophthalmology | Yes | Outpatient | Videoconference  | Mixed |
| Zarchi, 2015 | 90A: 40B: 50 | Chronic wound patients in home care | Home-care nurses | Hospital-based wound-expert teams | NR | Outpatient | Store and forward | Asynchronous  |
| Zilliacus, 2011 | 195A: 89B: 106Completed questionnaires | Adult women | Genetic counselor | Genetic specialist | Yes | Outpatient | Videoconference  | Real-time |

CBOC = community-based outpatient clinics; CT = computed tomography; DN = diabetic nephropathy; E-consult = electronic consultations; ECG = electrocardiogram; ED = emergency department; EKG = electrocardiogram; EMS = emergency medical services; ENT = ear, nose, throat specialist (otorhinolaryngologist); GP = general practitioner; HCV = hepatitis C virus; LHIN = Local Health Integration Networks; LTC = long-term care; NR = not reported; PTSD = post-traumatic stress disorder; VA = Veteran’s Affairs

a For definitions of interventions and comparisons (e.g., A vs. B), see Table F-7

**See Appendix C. Included Studies for full citations**