STATE OF MARYLAND
DHMH
Maryland Department of Health and Mental Hygiene
201 W. Preston Street • Baltimore, Maryland 21201
Martin O'Malley, Governor – Anthony G. Brown, Lt. Governor – Joshua M. Sharfstein M.D., Secretary

DEC 0 4 2012

The Honorable Thomas M. Middleton
Chair
Senate Finance Committee
3 East Miller Senate Office Building
Annapolis, MD 21401-1991

The Honorable Peter A. Hammen
Chair
House Health & Government Operations Committee
241 House Office Building
Annapolis, MD 21401-1991

RE: SB 781/HB 1149 (Chapters 579/580 of the Acts of 2012) – Report on Telemedicine Policies and Fiscal Impact of Maryland Medical Assistance Coverage of Telemedicine

Dear Chairmen Middleton and Hammen:

Pursuant to SB 781/HB 1149 (Chapters 579/580 of the Acts of 2012), *Health Insurance – Coverage for Services Delivered Through Telemedicine*, the Department of Health and Mental Hygiene (the Department) submits the attached report on telemedicine policies and the fiscal impact of Maryland Medical Assistance coverage of telemedicine.

The legislation requires that the Department conduct a review of literature and evidence regarding the different types of telemedicine; other payers' and other state Medicaid agencies' telemedicine policies and procedures; and evidence regarding the appropriate use of telemedicine in delivering mental health services. Based on this review, the legislation requires the Department to determine which types of patients would be suitable for which types of telemedicine; conduct a fiscal impact analysis that estimates the potential effect of Medicaid coverage of telemedicine on utilization, price, substitution, and effects on other services; and provide recommendations on the provision of telemedicine for the Maryland Medical Assistance Program population, including any cost-neutral coverage of telemedicine that can be implemented in fiscal year 2013 and coverage of telemedicine that would require additional funding to implement in fiscal year 2014.

We hope you find this information helpful. If you have questions regarding this report, please contact Ms. Marie Grant, Director of Governmental Affairs, at (410) 767-6481.

Sincerely,

Joshua M. Sharfstein, M.D.
Secretary

Enclosure

cc: Charles Milligan
Tricia Roddy
Susan Tucker
Laura Herrera
Marie Grant

Background

When patients have limited access to health care providers, they are less likely to receive timely diagnosis, treatment, and monitoring of their health conditions. While face-to-face consultations with the patient are preferred whenever possible, there are instances where this is not possible due to a shortage of providers in the area. In these instances, telemedicine, which is the use of electronic communication equipment for the delivery of medical services, has been found to be an effective tool in increasing patient access, improving quality of care, and promoting better communication and coordination among providers.

This paper addresses three primary modalities through which telemedicine services are provided. The most commonly used is "hub-and-spoke" video conferencing, in which a patient in a remote location (spoke) interacts with a physician at a larger health facility (hub). The next most common service is "store-and-forward," in which medical images or other media are captured by one provider and sent electronically to another provider, such as a radiologist. A third type of telemedicine is home health telemonitoring, in which providers are allowed to monitor a patient's condition via networked equipment in the patient's home.

Literature Review

The Department conducted a literature review on telemedicine technologies. The goal of this review was to identify which modalities and specialties improve access, improve patient outcomes, and produce cost savings or are cost-neutral.

Hub-And-Spoke. A systematic review of 36 high-quality studies found that 61 percent of those studies showed telemedicine (hub-and-spoke) to be less costly than regular health delivery.[1] While utilization increased among patients that previously had poor access to care, there were cost savings elsewhere. The cost savings were primarily a result of providing timely access to care for patients that might have otherwise sought care in emergency departments (ED) and with other high-cost providers. Savings also resulted from reduced transportation costs for the patient, as well as Medicaid programs when transportation was provided as an ancillary service. Some of the studies also showed that patients newly able to regularly access providers via telemedicine had improved health outcomes over the long-term, which resulted in lower utilization over time.

[1] Wade VA, et al. A systematic review of economic analyses of telemedicine services using real time video communication. BMC Health Services Research 2010;10:233.

But a review of studies found that hub-and-spoke telemedicine is not cost-effective when the two providers are in close geographic proximity.[2] Three studies of patients all showed similar patient outcomes and an increase in the costs of care – the patients consulted with a specialist at a hospital located close to their primary care physician's office. Close was defined as no more than 15 miles away. While two of the studies showed modest time and travel savings for patients, all showed a significant increase in spending on health services due to increased utilization.

Finally, there is concern that the existing provider payment rules create abnormal incentives under a hub-and-spoke telemedicine policy. Such a policy may increase costs without providing a substantial benefit to patients. For instance, typically primary care physicians refer patients directly to specialists without the need to examine the patient in their own office. The Department is concerned that the rules governing reimbursement when applied in the telemedicine context may now encourage unnecessary costs, *e.g.*, primary care physicians who once told patients to go directly to a specialist may now require that the patient report to the primary care physician's office so that the primary care doctor may be the one to initiate contact with the specialist. Doing so would permit the primary care physician to charge both a physician as well as a possible hospital facility charge if the primary care physician's practice is located on hospital regulated space, both of which could raise costs without adding a substantial benefit to the patient's care, particularly if the primary care provider and specialist are in close proximity. Other states could establish payment incentives to deter such practices and potential additional costs. Maryland Medicaid, however, is unable to negotiate rates with hospitals. It must pay the regulated hospital rates set by the Health Services Cost Review Commission (HSCRC). The Department seeks additional input from the HSCRC concerning this issue.

Store-And-Forward. A limited number of studies have been conducted on store-and-forward technologies. A systematic review conducted by the Veterans Health Administration found some studies that suggest store-and-forward technology for dermatology results in cost savings. But the number and quality of the existing cost studies are too limited to draw definitive conclusions. Importantly, the review found that store-and-forward was less accurate than in-person care in the diagnosis and management of dermatologic conditions.[3] A study of three community clinics in Massachusetts found savings when fetal

---

[2] Wade VA, Karnon J, Elshaug AG, Hiller JE. A systematic review of economic analyses of telemedicine services using real time video communication. BMC Health Services Research 2010;10:233.

[3] Warshaw E, et al. Teledermatology for diagnosis and management of skin conditions: A systematic review of the evidence. 2010. Prepared for the Department of Veterans Affairs, Health Services Research and Development Service. Available at http://www.hsrd.research.va.gov/publications/esp/telederm.cfm.

ultrasounds were transmitted electronically rather than by videotape via courier transport to the other facility.[4] Overall, however, the Agency for Healthcare Research and Quality concludes that the existing body of evidence is "of insufficient quality to judge the efficacy" of store-and-forward. They state also that there is "insufficient evidence to determine whether store-and-forward telemedicine affects the costs of care,"[5] noting that in the studies, savings are almost always a result of reduced travel, not changes in utilization.

Home Health Telemonitoring. A systematic review of economic evaluations of home health telemonitoring for management of chronic diseases found evidence for reduced costs. While the review contained studies from many countries, 15 of the 16 U.S. studies find cost savings (with one finding no change in costs). These studies consider home monitoring for congestive heart failure, diabetes, chronic obstructive pulmonary disease, and multiple conditions.[6] The studies, however, do not focus on the Medicaid population.

Review of Other Payers and State Medicaid Agency Policies and Procedures

Medicaid. The Department conducted a review of other states' Medicaid policies for telemedicine. Our review focused on the types of services covered by states and the modalities of telemedicine covered. In total, 38 state Medicaid programs cover at least some services through telemedicine. A total of 14 states cover all or nearly all medically necessary Medicaid services that can feasibly be provided via telemedicine, while 35 states cover physician consultations. Twenty-six states cover at least some mental health services via telemedicine, including Maryland. Maryland's telemental health policy requires that the originating or spoke provider be located in the one of the following counties: Garrett, Allegany, Calvert, Charles, St. Mary's, Worcester, Wicomico, Washington, Somerset, Cecil, Kent, Queen Anne, Dorchester, Talbot, or Caroline (collectively, the "Telemental Spoke Provider Counties"). These counties are predisposed to benefit from telemedicine because of the difficulty accessing mental health services due to various issues, such as whether the area is rural or has a shortage of health professionals.

---

[4] Magann EF, et al. The use of telemedicine on obstetrics: A review of the literature. Obstetrical and Gynecological Review 2011;66(3): 170-178.

[5] Hersh WR, Hickam DH, Severance SM, Dana TL, Krages KP, Helfand M. Telemedicine for the Medicare Population: Update. Evidence Report/Technology Assessment No. 131 (Prepared by the Oregon Evidence-based Practice Center under Contract No. 290-02-0024.) AHRQ Publication No. 06-E007. Rockville, MD: Agency for Healthcare Research and Quality. February 2006.

[6] Polisena J, et al. Home telemedicine for chronic disease management: A systematic review and an analysis of economic evaluations. International Journal of Technology Assessment in Health Care 2009;25(3):339-349.

All 38 states providing telemedicine coverage cover some hub-and-spoke services. A total of 16 states cover some store-and-forward services and 15 states cover home health monitoring. See *Appendix 1* for a table of Medicaid telemedicine coverage for all 50 states and the District of Columbia.

Private payers. CareFirst BlueCross BlueShield, the largest private insurer in Maryland, initiated a reimbursement policy for telemedicine visits across medical disciplines effective July 15, 2011. Telemedicine services for diagnosis, consultation, or treatment must meet all the medical policy requirements of a face-to-face consultation or contact between a health care provider and a patient. Initial telemedicine visits for new patients are limited to consultations, while subsequent telemedicine visits may be for other types of services. Utilization review may be performed for any telemedicine service. Documentation in the medical record must support the services rendered. CareFirst does not cover any costs of technical equipment or transmission for the provision of telemedicine services. Deductibles, copayments, or coinsurances apply to telemedicine services just as they do for face-to-face diagnoses, consultations or treatment services.

Fiscal Analysis

Assumptions. The primary goal of telemedicine is to increase access to health care in areas with reduced access to providers, such as rural counties like Somerset and Allegany. With telemedicine coverage in place, it is assumed that utilization of health services will increase in underserved areas to match utilization rates in areas without reduced access to providers. These increases in utilization will result in increased health spending. Utilization of telemedicine services in areas without reduced access to care can be considered as a substitute for in-person services. This substitution of in-person services could result in additional expenditures if primary care providers who normally would direct patients to a specialist's office (which results in only one physician charge) now have patients come to their office and, through the use of telemedicine, contact the specialist with the patient (which results in two physician charges).

Methodology. The Department worked with the Hilltop Institute to assess how telemedicine coverage might affect Medicaid utilization and spending. The Department focused on the telemedicine modality where the research demonstrates improved quality of care or cost savings for the Medicaid population, *i.e.*, the hub-and-spoke modality. The Department, therefore, assumes that providers use the hub-and-spoke video conferencing capabilities, in which a patient in a remote location (spoke) interacts with a physician at a larger health facility (hub).

Hilltop reviewed the use-rates by county and by medical specialty. It identified the areas where utilization was lower than one standard deviation from the average statewide utilization within a specialty. These areas generally aligned with the Department's current telemental health policy, *i.e.*, the Telemental Spoke Provider Counties. Because generally Hilltop's analysis identifies the Telemental Spoke Provider Counties as low utilization areas for other medical specialties, the Department elected to limit its analysis to these areas.

The Department assumed that those counties with low use-rates would experience an increase in service use-rates if telemedicine was available. Hilltop calculated the number of specialist visits that would be required to raise these low utilization counties to within one standard deviation from the average statewide utilization within a specialty. Hilltop also estimated the cost per visit in each specialty at payments of $100, $75, and $50 to develop liberal, moderate, and conservative estimates, respectively, of how much the increase in utilization would increase Medicaid expenditures. The Department assumed both the hub-and-spoke providers are billing for their services, that 50 percent of the hub providers are located in a hospital facility that is regulated by the HSCRC, and that it is generating a hospital facility bill as well. This 50 percent assumption is conservative, because it limits the hospital-based providers to a portion of the hub providers and does not assume that the spoke providers are located in a hospital regulated facility.

Results. The increase in Medicaid expenditures is predicted to be in the range of $500,000 to $700,000 (total funds) for all specialties.

Analysis. The range of cost increases is relatively low. It is important to note that Hilltop's analysis did not include any cost savings from (1) reductions in ED use over the short-term, (2) fewer transportation services, or (3) decreased utilization due to improved health status over the long-term. Such analyses require complex actuarial modeling over a long period of time, which is not feasible for this report. Regardless, the research literature suggests that the low projected increases in spending from telemedicine utilization will be largely offset by reduced ED visits and transportation costs.

Policy

Based on the fiscal analysis, the Department recommends that Medicaid cover medically necessary services that can reasonably be provided via hub-and-spoke. While store-and-forward has shown some evidence of cost-effectiveness, overall the evidence is mixed and inconclusive. Most of the

studies lack a rigorous peer-review and none focus on the Medicaid population. Similarly, while home health telemonitoring has shown more positive evidence of cost savings, it has not been studied in the Medicaid population. For both modalities, only a small number of state Medicaid programs currently provide coverage. For these reasons, the Department does not recommend that Medicaid cover these modalities at this time.

In addition, to prevent unnecessary use of telemedicine technologies, the Department recommends that coverage be limited to rural geographic areas and conform to the restrictions developed for Medicaid coverage of telemental health services as used in the fiscal analysis.[7] In other words, the originating or spoke provider must be from one of the Telemental Spoke Provider Counties and the hub provider can be anywhere in the state. This limitation will help ensure that telemedicine is being used to address access to care issues stemming from specialists being located a long distance from patients and not as a replacement for in-person care. This policy is justified based on findings from the research literature, which conclude that when hub-and-spoke telemedicine is delivered by providers located less than 15 miles from one another costs increase. In such instances, there are some savings due to prevented transports via ambulance and reduced patient-incurred travel costs. But such savings are exceeded by the other costs, such as those associated with increased utilization. Moreover, in those instances when patients replace in-person services with telemedicine services, it is not expected that their outcomes will improve such that there will be ultimately a reduced utilization long-term. The Department is considering whether to recommend authorizing pre-authorization requirements to encourage the use of in-person service when feasible and to limit telemedicine utilization to only necessary circumstances.

Once implemented, the Department will continue to evaluate its telemedicine policy and determine if changes are warranted. The Department needs additional input from the HSCRC. One critical area concerns whether hospitals that host physicians who offer telemedicine services will be entitled to reimbursement of hospital facility rates. The Department is keenly concerned about whether the existing rules create an unintended incentive for physicians or hospitals to seek reimbursement for facility costs when patients use telemedicine. For example, hospital-based primary care physicians who normally would direct patients to a specialist's office (which results in only one physician charge and one hospital facility charge) may have an incentive now to have patients come to their office and, through the use of telemedicine, contact the specialist with the patient physically present in the primary care physician's office (which results in two physician charges and two hospital facility charges). Should the Department

[7] COMAR 10.21.30.02.

determine that existing telemedicine policies are raising or have the potential to raise costs without providing a substantial additional benefit to patients, the Department will take action to correct any such aberrant incentives.

Next Steps

The Department will be working on detailed policy guidance and regulations to implement telemedicine coverage effective July 2013. Additionally, it will continue to evaluate whether the Department's policy should include store-and-forward and home health telemonitoring.

Appendix 1

Medicaid Telemedicine Coverage by State

State	Modalities	Services	Non-Physician Providers	Reimbursement (Hub-and-Spoke)	Geographic Restrictions
Alabama	Hub-and-spoke Home monitor Store and forward (dermatology only)	Psychiatric services Dermatology Home health (only for physicians participating in primary care case management program)	No.	Hub: Normal FFS payment rate Spoke: No payment	
Alaska	Hub-and-spoke Home monitor Store and forward	Covers all medically necessary Medicaid services.	Yes, nurse practitioners.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, no reimbursement for store and forward	
Arizona	Hub-and-spoke Home monitor Store and forward	Covers all medically necessary Medicaid services.	Yes, referring provider can be physician, PA, RN practitioner, RN midwife, or clinical psychologist. Consultants also can include behavioral health professional, or an occupation, physical, speech, or respiratory therapist. Provider can designate a trained telepresenter if the PCP is not present.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, no facility fee	
Arkansas	Hub-and-spoke Home monitor	Physician consultations Home health Psychiatric services	No.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, no facility fee	
California	Hub-and-spoke Home monitor Store and forward Email and telephone	Covers all medically necessary Medicaid services.	Yes, any provider of qualifying services.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate and $17 facility fee	

Appendix 1

Medicaid Telemedicine Coverage by State

State	Modalities	Services	Non-Physician Providers	Reimbursement (Hub-and-Spoke)	Geographic Restrictions
Colorado	Hub-and-spoke Home monitor	Covers all medically necessary Medicaid services.	Yes, any provider of qualifying services.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate if services provided; only $17 facility fee otherwise.	Limited to counties with fewer than 150,000 residents
Connecticut	None				
Delaware	Hub-and-spoke Store and forward	Will begin reimbursement July 1, 2012. Unclear what services will be covered.			
District of Columbia	None				
Florida	Small demonstration project only.				
Georgia	Hub-and-spoke	Physician consultations only	Yes, physician assistants, and ARNPs may bill for their services.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, no facility fee	
Hawaii	Hub-and-spoke Home monitor	Covers all medically necessary Medicaid services.	Yes, any provider of qualifying services.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, no facility fee. Transportation costs covered.	Must be in HPSA and/or county outside a MSA
Idaho	Hub-and-spoke	Psychiatric care only.	No.	Hub: Normal FFS payment rate Spoke: $20 facility fee	
Illinois	Hub-and-spoke Store and forward	Physician consultations Psychiatric services	Yes, any provider of qualifying services.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate and $17 facility fee.	
Indiana	Hub-and-spoke	All medically necessary Medicaid services except ambulatory and outpatient surgery, home health, radiological, laboratory, LTC, anesthesia, audiological, chiropractic, DME, optometric, speech therapy, physical	Yes, any provider of qualifying services.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, only if hub site deems provider's presence medically necessary, plus facility fee.	Hub-and-spoke sites must be more than 20 miles apart.

Appendix 1

Medicaid Telemedicine Coverage by State

State	Modalities	Services	Non-Physician Providers	Reimbursement (Hub-and-Spoke)	Geographic Restrictions
		therapy, transportation, and Medicaid waiver services.			
Iowa	None				
Kansas	Hub-and-spoke Home monitor	Physician consultations Mental health services Home health care Pharmacological management services	Yes, any provider of qualifying services.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, $20 facility fee. Home health: Reduced rates	
Kentucky	Hub-and-spoke Store and forward	Physician consultations Psychiatric services (12 per yr)	Yes, ARNPs and PAs working under physician supervision.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate	
Louisiana	Hub-and-spoke	Physician consultations Mental health services	Yes, RNs, PAs and other allied health professionals.	Hub: FFS, no less than 75% normal payment Spoke: FFS, no less than 75% normal payment	
Maine	Hub-and-spoke Home monitor	Physician consultations Other medically appropriate services	Yes, RNs, PAs and other allied health professionals.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, no facility fee	
Maryland	Hub-and-spoke	Psychotherapy Mental health pharmacologic management Psychiatric interview	No, distant provider must be a psychiatrist.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, $23 facility fee.	Limited to "designated rural geographic areas."
Massachusetts	None				
Michigan	Hub-and-spoke	Physician consultations Office or other outpatient visits Psychotherapy Pharmacologic management Psychiatric diagnostic exam ESRD	Yes, RNs, PAs, psychologists, social workers.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, $20 facility fee.	Hub-and-spoke must be at least 50 miles apart.
Minnesota	Hub and spoke Home monitor Store and forward	Physician consultations, including mental health Home health	Yes, RNs, PAs, midwives, podiatrist, and other allied professionals as referrers. Hub providers must be physicians.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, $11 facility fee. No spoke payment for mental health services.	

Appendix 1

Medicaid Telemedicine Coverage by State

State	Modalities	Services	Non-Physician Providers	Reimbursement (Hub-and-Spoke)	Geographic Restrictions
				$5-$15/day for home monitoring services. Non-physicians (except midwives) reimbursed at 90% of physician's rate.	
Mississippi	None				
Missouri	Hub-and-spoke Home monitor Store and forward	Covers all medically necessary Medicaid services.	Yes, any provider of qualifying services.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, but only if provides a billable service; $17 facility fee.	
Montana	Hub-and-spoke	Any medical or psychiatric service already covered by state plan.	Yes, any provider of qualifying services.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, $17 facility fee. ARNPs and PAs reimbursed at 90% of physician's rate.	
Nebraska	Hub-and-spoke	All Medicaid services except DME and supplies, orthotics, prosthetics, personal care aides, pharmacy services, medical transportation services, MHSA, home & community-based waiver services.	Yes, any provider of qualifying services.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate Payment for transmission costs. Also can receive transmission fee of $.05 per minute.	Coverage only when no comparable service within 30 mile radius of patient's home.
Nevada	None				
New Hampshire	None				
New Jersey	None				
New Mexico	Hub-and-spoke	Physician consultations Evaluation and mgmt services Psychotherapy Pharmacologic management Psychiatric diagnostic	Yes, any provider of qualifying services.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, $17 facility fee.	Spoke must be located in a non-MSA and/or a HPSA.

Appendix 1

Medicaid Telemedicine Coverage by State

State	Modalities	Services	Non-Physician Providers	Reimbursement (Hub-and-Spoke)	Geographic Restrictions
		interviews ESRD services Medical nutrition services			
New York	Hub-and-spoke Home monitor Store and forward	Physician consultations Home health	Yes, any provider of qualifying services.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, no facility fee	
North Carolina	Hub-and-spoke	Physician consultations Psychiatric services	Yes, any provider of qualifying services.	Hub: 75% of FFS Spoke: 25% of FFS Will soon change to 100% at hub and $20 facility fee to spoke.	
North Dakota	Hub-and-spoke	Physician consultations Psychotherapy	No.	Hub: Normal FFS payment rate Spoke: Regular FFS for any service rendered, plus $20 facility fee	
Ohio	None				
Oklahoma	Hub-and-spoke Home monitor	Physician consultations Mental health services Home health Endocrinology	Yes, any provider of qualifying services.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, $17 facility fee.	
Oregon	Hub-and-spoke Telephone and email Store and forward	Physician consultations	Yes, any provider of qualifying services.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, $17 facility fee.	
Pennsylvania	Hub-and-spoke Home monitor Store and forward	Physician consultations Home health, including health status monitoring, activity and sensor monitoring, and medication dispensing and monitoring	Yes, any provider of qualifying services.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate RPM – $10 per day $90 one-time install/un-install Activity/Sensor-$80/mo. $200 one-time install/un-install Meds Dispensing-$50/mo.	

Appendix 1

Medicaid Telemedicine Coverage by State

State	Modalities	Services	Non-Physician Providers	Reimbursement (Hub-and-Spoke)	Geographic Restrictions
Rhode Island	None				
South Carolina	Hub-and-spoke Store and forward	Physician consultations Psychiatric services Stroke treatment	Yes, RNs, PAs, clinical, clinical psychologists and clinical social workers may refer patients for tele-consultation.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, $17 facility fee.	
South Dakota	Hub-and-spoke Store and forward	Physician consultations	Yes, ARNPs, DOs, and nurse midwives are allowed to bill as are rural health clinics and federally qualified health centers.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, no facility fee	
Tennessee	None				
Texas	Hub-and-spoke Store and forward	Physician consultations Psychotherapy Pharmacologic management	Yes, ARNPs, DOs, and nurse mid-wives.	Normal FFS payment rate Spoke: Normal FFS payment rate, no facility fee	Limited to residents of a HRSA-defined medically underserved area (MUA) or populations (MUP), and/or residents of counties with a population under 50,000.
Utah	Hub-and-spoke	Mental health consultations Diabetes self-management Services for children with special health needs residing in rural areas	Yes, any provider of qualifying services.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, except no payment for mental health services. Payment also made for transmission fees.	Services for children with special health needs limited to those in rural areas (no definition).
Vermont	Hub-and-spoke Store and forward	New law takes effect October 2012. Unclear what services will be covered.			

Appendix 1

Medicaid Telemedicine Coverage by State

State	Modalities	Services	Non-Physician Providers	Reimbursement (Hub-and-Spoke)	Geographic Restrictions
Virginia	Hub-and-spoke	Physician consultations Psychotherapy Diabetic retinopathy screening Colposcopy Obstetric ultrasound Cardiography (interpretation and report) Echocardiography Pharmacologic management	Yes, any provider of qualifying services.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, $17 facility fee.	
Washington	Hub-and-spoke	Physician consultations	Yes, ARNPs only.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, $20 facility fee.	
West Virginia	Hub-and-spoke	Physician consultations	Yes, any provider of qualifying services.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, no facility fee	Limited to residents of health professional shortage areas (HPSAs).Referring provider must be located in a non-metropolitan area.
Wisconsin	Hub-and-spoke	Physician consultations Office visits Initial inpatient consultations Outpatient mental health Outpatient substance abuse Health and behavior assessment/intervention ESRD-related services	Yes, PAs, ARNPs, nurse midwives, clinical psychologists.	Hub: Normal FFS payment rate Spoke: Normal FFS payment rate, $17 facility fee. Enhanced reimbursement is for patients/providers located in HPSAs.	
Wyoming	Hub-and-spoke	Covers all medically necessary Medicaid services.	Yes, any provider of qualifying services.	Hub: Normal FFS payment rate Spoke: $20 facility fee	

Sources: (1) American Telemedicine Association Wiki. State Summaries. Available online at http://wiki.americantelemed.org/index.php?title=Category:US_States; and (2) Center for Telehealth and e-Health Law (CTeL). 50-State Survey on Medicaid Telehealth and Telehomecare Policies**.** Available online at http://ctel.org/library/research.