Table F-4. Emergency medical services/emergency department evidence table: study characteristics

| **Author, Year**  (See Appendix C for full citation) | **Geographic Location of Studies** | **Study Period** | **Study Design** | **Comparison and Intervention** |
| --- | --- | --- | --- | --- |
| Amorim, 2013 | Pennsylvania  USA | March 2005 to December 2008 | Before-After | A: Before telestroke implementation B: After telestroke implementation |
| Astarcioglu, 2015 | Turkey | January 2015 to May 2015 | Prospective Cohort | A: Concurrently treated STEMI patients who were not triaged B: Smartphone triaged STEMI patients in the ER |
| Audebert, 2006 | Bavaria  Germany | July 2003 to March 2005 | Prospective Cohort | A: 5 hospitals without specialized stroke care  B: 5 hospitals without specialized stroke care with telehealth stroke support |
| Bergrath, 2012 | Aachen  Germany | May 2010 to September 2010 | Prospective Cohort | A: Usual care B: Telehealth |
| Bladin, 2015 | Australia | A: January to December 2010  B: October 2011 to October 2012 | Before-After | A: Before telestroke protocol initiation  B: After telestroke initiation |
| Brennan, 1998 and 1999 | Northwest New Jersey  USA | NR | RCT | A: Usual care  B: Telehealth |
| Brokmann, 2016b | Aachen  Germany | August 2012 to July 2013 | Before-After | A: Before telehealth  B: After telehealth |
| Brokmann, 2016 | Aachen  Germany | Before: April 2011 to March 2012  After: August 2012 to August 2013 | Before-After | A: Before telehealth  B: After telehealth |
| Brunetti, 2014 | Apulia  Italy | October 2012 to April 2013 | Prospective Cohort | A: Usual care B: Telehealth |
| Chan, 2012 | British Columbia  Canada | April 2009 to March 2011 | Retrospective Cohort | A Usual care B: Telehealth |
| Cho, 2011 | Seoul  Korea | March 2008 to February 2009 | RCT | A: Usual care B: Tele-airway |
| Choi, 2006 | Texas  USA | A: January 2003 to March 2004 B: April 2004 to May 2005 | Before-After | A: Patients treated with tPA without telestroke B: Patients treated with tPA with telestroke |
| Chowdhury, 2012 | London  United Kingdom | July 2007 to Dec 2009 | Retrospective Cohort | A: Usual care B: Telehealth |
| Darkins, 1996 | Ireland | A: September 1993 to September 1994 B: October 1994 to October 1995 | Before-After | A: Before telehealth B: After telehealth |
| Dayal, 2016 | Sacramento, California  USA | 2010 to 2014 | Retrospective Cohort | A: Usual care B: Telehealth |
| Demaerschalk, 2010 | USA | December 2007 to October 2008 | RCT | A: Telephone only B: Telehealth |
| Dharmar, 2013 | Rural California  USA | 4-year period (2 years before tele and 2 years after)  Dates not specified | Retrospective Cohort | A: No consultation completed B: Emergency consults completed by teleconsult C: Emergency consults completed by telephone |
| Dharmar, 2013 | California  USA | January 2003 to December 2009 | Retrospective Cohort | A1: No telehealth, no consult A2: No telehealth, phone consult B: Telehealth |
| Dharmasaroja, 2010 | Thammasat  Thailand | A: June 2007 to February 2008 B: March 2008 to March 2009 | Before-After | A: Before implementation of telestroke network  B: After implementation of telestroke network |
| Duchesne, 2008 | USA | January 2000 to January 2005 | Before-After | A: Before trauma telehealth implementation B: After trauma telehealth implementation |
| Fong, 2015 | Hong Kong | January 2009 to December 2012 | Prospective Cohort | A: Neurologist on site  B: Telestroke, no neurologist on site |
| Goh, 1997 | Hong Kong | March 1995 to May 1996 | Prospective Cohort | A: Usual care  B: Teleradiology |
| Handschu, 2008 | Bavaria  Germany | 1 year  Dates not specified | Prospective Cohort | A: Usual care (telephone consult)  B: Telestroke with video |
| Hashimoto, 2001 | Japan | 1994 to 1999 | Before-After | A: Before telehealth  B: After telehealth |
| Heffner, 2015 | Pennsylvania  USA | 2006 to 2014 | Retrospective Cohort | A: Patients treated at regional stroke center  B: Patients treated at hospital served by telehealth and remained at the local hospital  C: Patients treated at hospital served by telehealth and transferred to regional stroke center |
| Hubert, 2016 | Helsinki  Finland | January 2011 to December 2013 | Retrospective Cohort | A: Usual care B: Telehealth |
| Ickenstein, 2005 | Germany | December 2001 to December 2003 | Before-After | A: Before telehealth B: After telehealth |
| Ionita, 2009 | New York  USA | January 2006 to December 2008 | Retrospective Cohort | A: Patients treated with thrombolysis at a regional medical center  B: Patients treated with thrombolysis at community hospitals via telemedicine |
| Itrat, 2016 | USA | July 2014 to November 2014 | Prospective Cohort | A: Usual care B:Telehealth |
| Johansson, 2011 | Salzburg  Austria | 2006 to 2009 | Retrospective Cohort | A: Usual care B: Telehealth |
| Kim, 2011 | Wonju  South Korea | June 2007 to March 2008 | Retrospective Cohort | A: Patients without telemetry system B: Patients with telemetry system |
| Langabeer, 2016 and 2017 | Houston, Texas  USA | January to December 2015 | Retrospective Cohort; Economic Evaluation | A: Usual care  B: Teleconsult |
| Macedo, 2016 | San Paulo  Brazil | 2011 to 2014 | Before-After | A: Before telehealth B: After telehealth |
| Machado, 2018 | Columbus, Ohio  USA | July 2010 and February 2013 | Retrospective Cohort | A: Usual care B: Telehealth |
| Marcolino, 2013 | Belo Horizonte  Brazil | 2009 to 2011 | Before-After | A: Before telehealth  B: After telehealth |
| Martinez-Sanchez, 2014 | Madrid  Spain | Pre: March 2008 to February 2010  Post: March 2010 to February 2013 | Before-After | A: Before telestroke  B: After telestroke |
| Martinoni, 2011 | Italy | 18 month period | Retrospective Cohort | A: Usual care B: Telehealth |
| Mathews, 2008 | Australia | September 2006 to March 2007 | Before-After | A: All patients referral for rural transfer for 6-month period before tele-link  B: All patients referral for rural transfer for 6-month period after tele-link who received a teleconsult.  C: All patients referral for rural transfer for 6-month period after tele-link who did not receive a teleconsult |
| Mazighi, 2017 | Paris  France | April 2006 to March 2010 | RCT | A: Usual care  B: Telethrombolysis |
| Meyer, 2008 | NR | January 2004 to August 2007 | RCT | A: Telephone only consultation  B: Telemedicine |
| Mohr, 2018 (same patients as Mohr 2017) | North Dakota  USA | 2008 to 2014 | Retrospective Cohort | A: Usual care B: Telehealth |
| Mohr, 2017(same patients as Mohr 2018) | North Dakota  USA | 2008 to 2014 | Retrospective Cohort | A: Usual care  B: Telehealth |
| Nagao, 2012 | Melbourne, Victoria Australia | Telestroke: October 2009 to September 2010 and control group: October 2008 to September 2009 | Before-After | A: Before telestroke B: After telestroke |
| Narasimhan, 2015 | USA, South Carolina | March 2009 to June 2013 | Prospective Cohort | A: Patients with the same mental health conditions and demographic characteristics but were treated in hospitals that did not have telepsychiatry. B: Telepsychiatry recipients |
| Natafgi, 2017 | 7 states  85 rural hospitals Hub located in South Dakota  USA | October 2009 to February 2014 | Economic Evaluation | A: Tele-ED not activated B: Tele-ED activated |
| Nguyen-Huynh, 2018 | Northern CA USA | 2015 to 2016 | Before-After | A: Before telehealth B: After telehealth |
| Noble, 2005 | Single hospital ED  United Kingdom | NR | Economic Evaluation | A: Hospitals without teleconsultations B: Hospitals with teleconsultations |
| Ortolani 2006 | Bologna  Italy | January 2003 to December 2004 | Retrospective Cohort | A: ED  B: Local hospital  C: Telehealth |
| Ortolani, 2007 | Italy | January 2003 to December 2005 | Retrospective Cohort | A: Conventional hospital-based triage  B: Pre-hospital telemedicine ambulance triage |
| Paik, 2017 | Newark, New Jersey  USA | May 1, 2013 to May 31, 2013 | Retrospective Cohort | A: Usual care B: Telehealth |
| Patel, 2015 | Wilmington, Delaware  USA | July 2012 to September 2012 | RCT | A: Cell phone B: Telehealth |
| Pedersen, 2009 | Denmark | January 2005 to July 2008 | Prospective Cohort | A: Usual care B: Telehealth |
| Pedragosa, 2009 | Spain | January 2006 to December 2007 | Before-After | A: Before telemedicine B: After telemedicine |
| Pervez, 2010 | Boston, Massachusetts  USA | January 2003 to March 2008 | Retrospective Cohort | A: Telephone  B: Telehealth (for treatment in place) |
| Poon, 2001 | Hong Kong | October 1998 to July 1999 | RCT | A: Telephone consultation  B: Teleradiology and telephone consultation  C. Video-consultation |
| Saffle, 2009 | USA | 2003 to August 2007 | Before-After | A: Before telemedicine for acute burn implementation B: After telemedicine for acute burn implementation |
| Sairanen, 2011 | Helsinki  Finland | 2007 to 2009 | Prospective Cohort | A: Usual care B: Telehealth |
| Sanchez-Ross, 2011 | New Jersey  USA | June 2006 to February 2009 | Prospective Cohort | A: Usual care B: STAT-MI Network |
| Schwab, 2007 | Regensburg and Munich  Germany | February 2003 to November 2004 | Prospective Cohort | A: Usual care B: Telehealth |
| Sejersten, 2008 | Denmark | October 2003 to October 2005 | Prospective Cohort | A: Usual care B: Telehealth |
| Southard, 2014 | Indiana  USA | January 2009 to January 2010 | Before-After | A: Before telemedicine  B: After telemedicine |
| Switzer, 2009 | Augusta, Georgia  USA | February 2003 to March 2006 | Prospective Cohort | A: Emergency department B: Telehealth |
| Taqui, 2017 | Cleveland, Ohio  USA | July 2014 to November  2014 | Prospective Cohort | A: Traditional ambulance B: Mobile stroke unit |
| Theiss, 2013 | Erfurt  Germany | 2006 to 2009 | Before-After | A: Control hospitals without telemedicine  B: Comprehensive stroke centers  C: Neuro Net hospitals with stroke telemedicine |
| Traub, 2013 | Unclear  USA | April to June 2012 | Retrospective Cohort | A: Usual care  B: Telehealth |
| Tsai, 2007 | Taiwan | November 1999 to August 2003 | Prospective Cohort | A: Emergency air medical transport system before implementing preflight screening and teleconsultation B: Emergency air medical transport system after implementing preflight screening and teleconsultation |
| Wong, 2006 | Hong Kong | October 1998 to September 2001 | RCT | A: Telephone only consultation (standard of care)  B: Telephone + teleradiology (sharing of images)  C: Videoconference |
| Yang, 2015 | Northern, California  USA | January 2003 and May 2012 | Retrospective Cohort | A: Telephone B: Telehealth |
| Zaidi, 2011 | Pittsburgh, Pennsylvania  USA | July 2008 to July 2009 | Prospective Cohort | A: Stroke center  B: Telestroke |
| Zanini, 2008 | Mantova  Italy | June 2003 to June 2005 | Retrospective Cohort | A: Usual care B: Telehealth |
| Zennaro, 2014 | Italy | September 2013 to October 2013 | Pre/Post | A: Pediatric patients with fractures receiving telephone consultation from orthopedic surgeon on call  B: Same pediatric patients with fractures receiving telephone consultation from orthopedic surgeon on call this time including an image of the x-ray sent to the consulting orthopedic surgeon via an iPad |

ED = emergency department; RCT = randomized controlled trial; STAT-MI = ST-Segment Analysis Using Wireless Technology in Acute Myocardial Infarction; STEMI = ST-elevation myocardial infarction

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