Before exploring technology solutions, develop an overall framework for the process of planning your program such as NYMAC’s Telegenetics Program Planning Guide.

Be sure to begin by:

1. Outlining the telehealth needs of your community and setting.

2. Setting program goals and defining the clinical program model, including the who, what, when, where, why, how, and by whom. For technology considerations, pay special attention to:

   • Clearly defining your use case and its unique needs (e.g., Geneticists providing pediatric genetics consultations from offices at Academic Medical Center A to patients in offices at Community Hospital B, which will entail a detailed physical exam including heart sounds, skin exam, eye exam, etc.)

   • Outlining key workflow issues, such as:
     1. Will the consult take place from a provider’s office or home?*
     2. Will the consult take place from the patient’s home or a clinical site?*
     3. Is there a need to bring multiple locations into the consultation (multipoint)
     4. Will you be connecting with other providers, or just with patients?
     5. Is there a need for EHR integration?
     6. What are the needs around test ordering, blood draws, and consent forms?

* When selecting sites for consultations, be mindful of broadband needs and local capabilities, and plan to test your system thoroughly before launch

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Some Useful Telehealth Definitions

**Business Associate’s Agreement (BAA)** - Legal contract between partners for Protected Health Information (PHI) security and HIPAA compliance

**Channel Partner** - an organization that partners with a manufacturer to sell and/or support the manufacturer’s products or services

**Complete Solution** - comprehensive videoconferencing plan and tools for large or small enterprises, could include carts, desktop video, tablets, scheduling software etc.

**Endpoint** - physical hardware used to make video conferencing calls

**Interoperability** - video conferencing systems or video software that can connect with endpoints from other vendors

**Life cycle** - useful life of videoconferencing equipment, typically 3-5 years

**Multipoint** - 3 or more video connections in a video conference (e.g., doctor, genetic counselor, and patient)

**Point to point** - one-to-one video communication (e.g., doctor connects to patient)

**PTZ** - Camera that has the ability to pan, tilt, and zoom, allowing the provider to remotely control the patient’s camera during an examination.

**Recurring Costs** - ongoing costs for telehealth solutions (e.g., monthly subscriptions or annual maintenance agreements)
Examples of Telegenetics Applications and Possible Technology Models

**EXAMPLE #1:** Clinic-to-Clinic Live Videoconferencing for Cancer Genetic Counseling

- Genetic Counselor in clinic on a desktop computer using HIPAA-compliant videoconferencing software
- Patient in rural clinic on a clinic tablet using HIPAA-compliant videoconferencing software

**EXAMPLE #2:** Provider-at-home to Patient-at-home Videoconferencing for Preconception Genetic Counseling with document sharing for visual aids and consent forms

- Genetic Counselor at home on a computer using HIPAA-compliant videoconferencing software
- Patient at home using their personal device on which they downloaded HIPAA-compliant videoconferencing software

**EXAMPLE #3:** Multipoint Videoconferencing with a telemedicine cart with peripheral devices for Pediatric Genetics Consultations

- Dermascope
- Live Images
- Patient and Pediatrician in the Pediatrician's office using a Telemedicine cart
- Live video AND live images and sounds from scopes
- Geneticist in their office using HIPAA-compliant software on their desktop computer

Technology

<table>
<thead>
<tr>
<th>Technology</th>
<th>Estimated Cost (as of August 2018)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Videoconferencing Software: Facilitates a face-to-face connection using a computer, tablet, or smart phone. These may be used for clinical encounters, administrative meetings, educational webinars, and more.</td>
<td>Free- $400+ per mo.</td>
</tr>
<tr>
<td>Telemedicine Carts, Field kits, etc.: All-in-one systems that are built by a vendor (or custom fabricated) that contain all essential components for the originating site, such as a computer, peripherals, and more.</td>
<td>~ $5,000 - $35,000</td>
</tr>
<tr>
<td>Peripheral Devices: Stethoscopes, otoscopes, dermascopes, ophthalmoscopes, and other devices that acquire and transmit images and data for diagnosis, either viewed in real time or saved and viewed later.</td>
<td>$275 and up</td>
</tr>
<tr>
<td>Remote Patient Monitoring Kits: Internet connected scales, blood pressure monitors, glucometers, and other devices that acquire and transmit vital signs - for acute and/or chronic disease management. Devices connect via a mobile kiosk, tablet, or smart phone from home.</td>
<td>~ $10-100 per month per patient. Additional set-up costs, EHR integration fees, or consulting fees may apply</td>
</tr>
</tbody>
</table>

**EXAMPLE #4: Store-and-Forward telegenetics between dermatology clinic patients and Geneticists with EHR telemedicine module**

Dermatologist takes high resolution images with a dermascope, linked to their laptop, and uploads the images to the HIPAA-compliant EHR telemedicine module to request a genetics consult

Dermatologist accesses the Geneticist’s recommendations from the EHR on their office computer and follows up with patients accordingly

Geneticist accesses images from the EHR telemedicine module on their office computer, interprets them, and writes their opinion about recommended next steps in the EHR

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### Quick Tips for Successfully Using Telehealth Technologies

1. Make a test call and test the peripherals prior to an encounter
2. Check the audio and set the volume to a comfortable level
3. Check the video and lighting at both local and remote sites (see A.T.A. lighting guide)
4. Center and align the video image at both local and remote sites
5. Clear any room distractions: check the background at both sites
6. Control for any ambient noises
7. Prepare the room for the consult (e.g., note pad, pen, forms, visual aids, etc.)
8. Mute both sites until the specialist is ready
9. Remember, you are ALWAYS LIVE
10. Staff should prepare the specialist and the patient for the encounter
11. Unmute microphones, and make sure all participants are introduced, create a positive environment for all
12. Smile and use proper etiquette during the encounter
13. Speak at a normal volume and look directly into the camera
14. Use “quick glances” at the monitor - periodically check your picture for quality during the encounter
15. Minimize interruptions
16. Mute or disconnect at the end of the encounter and return the room to its original state
17. Report and document any technical issues experienced during the encounter

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### Vendor Selection Resources:

With an established program model and basic idea of technology needs in mind, there are a variety of resources that can assist in the process of comparing and selecting a telehealth technology vendor:

- **TRC Vendor Selection Factsheet:**

- **MATRC Vendor Selection Toolkit:**
  [https://toolkitvendor.matrc.org/](https://toolkitvendor.matrc.org/)

- **TTAC (National Telehealth Technology Assessment Resource Center):**

- **Your Regional Telehealth Resource Center:**
  [https://www.telehealthresourcecenter.org/](https://www.telehealthresourcecenter.org/)
Sample Telegenetics Technology Plan

A technology plan is one of several written documents that may be created as part of an overall telehealth program planning process. This is a generic example of what a technology plan for telegenetics could look like. It is not meant to be a prescriptive template. You should tailor your technology plan around the needs and expectations of your organization.

THE NEED:
The community hospital cares for patients in a 150 mile catchment area. The closest genetics team is 180 miles away, resulting in trips up to 4 hours for some patients who need care. Connecting with our academic medical center by telehealth will decrease barriers and improve access for patients in these rural areas, which is a core goal of our institution. The program also aims to reduce the number of declined, cancelled, and missed genetics appointments. The plan is supported by the administration and clinical staff at both sites.

THE MODEL:
Telegenetics will be available every other Tuesday from 8am to 2pm for referred pediatric patients within a dedicated room at the community hospital, and will be supported by a nurse on site. Patients will be connected to the geneticist or genetic counselor at the academic medical center via live video conferencing to the dedicated telegenetics room. Academic medical center plans to hire a nurse telehealth coordinator and has a large IT staff on site. Detailed physical exams will be necessary. The geneticist desires PTZ capability for the camera as well as peripheral devices for exams. Future ability to connect to patients at home, providers at home, and to include multiple providers in a visit, is desirable but not essential at this time. Expansion of this service to cancer, prenatal, and cardiac genetic services may be sought in the future.

Vendor Selection Process:
Before proceeding with vendor selection, we defined our needs, program goals, and program model, including our use cases and workflows. We also developed an estimated timeline for implementation as well as a financial model and budget for the program. All of these aforementioned details are outlined in our program charter, which was reviewed and approved by stakeholders (program planning documents are available upon request). We then engaged with the regional telehealth resource center for support, as well as the IT team at both sites. We reviewed numerous options that fit our program needs, and interviewed five different vendors. We received demos from these five vendors, which the clinical, administrative, and IT staff all participated in. We also contacted current users of all five vendors for their feedback, and reviewed information from TTAC.

The Proposed Solution:
Based on our extensive technology reviews, our current program model, and our modest budget, we are proposing to begin the program by utilizing ABCD technology between the genetics team in the Academic Medical Center and the patients in the Community Hospital. ABCD has agreed to allow us to pilot the technology for 90 days at no cost, during which time, we will survey the providers and patients about quality, ease of use, and stability. If implementation is desired after the pilot, contracts and other necessary documents will need to be put into place. There was strong group consensus that this solution brought the
greatest balance of cost and benefits to the program. ABCD can help with the initial phase plus support growth as needed.

- **Community hospital equipment:** ABCD Telemedicine Cart with the following peripherals:
  1. EFG Digital Scope System.
  2. HIJK Digital Stethoscope (Physicians also tested the LMNO Scope II and the PQRS stethoscopes when ABCD did their demo, but decided that the HIJK Digital Stethoscope was the best fit)

- **Academic medical center equipment:** ABCD Telehealth tablet or existing computers
  - Genetics provider equipment: Existing academic medical center equipment can be used, whereby IT could install the ABCD cloud based solution software on an existing tablet or computer. Alternatively, the ABCD Telehealth Tablet can be purchased. The availability of both of these solutions may be desirable. All of the ABCD solutions allow the geneticist PTZ control at the remote site.

- **Projected technology costs:** equipment for originating and distant sites, peripheral devices, annual contract, etc. (not including any staff costs-see financial model for overall program budget)
  - We are recommending purchasing the ABCD equipment, although leasing is also an option for lower up-front costs. Pricing below reflect equipment purchase.
  - Initial technology cost:  
    - Contract costs (includes tech support and system upgrades): $xxxx  
    - ABCD Telemedicine Cart with EFG Digital Scope System and HIJK Digital Stethoscope $xxxx  
    - 2 ABCD telehealth tablets $xxxx  
    - Telehealth room renovations $xxxx  
    - Training costs $xxxx  
  - Recurring technology costs:  
    - annual maintenance contract including service during normal business hours: $xxxx  
    - upgraded or replacement technology every 3-5 years

- **Attributes:** The chosen cart is light, easy to use, and is FDA approved. The selected peripheral devices are backed by various product reviews and are also all FDA approved. ABCD offers an end to end enterprise solution with all of the hardware, software and peripherals. They also have an infrastructure that can support equipment registration, monitoring and support. This is a single platform that can treat patients across the entire continuum of care. ABCD has been operating in the telehealth space for over 10 years and our review of existing client reviews and feedback was overwhelmingly positive. Currently, telegenetics is the focus, but other specialties can be added in the future without having to redesign the telehealth approach by using ABCD’s Enterprise Solution. This is a streamlined solution to meet the immediate technology needs, with the capability for future expansion. IT support will be provided by the academic medical center and by ABCD monitoring. ABCD’s solution provides branding, a dashboard for scheduling and data analytics, and is integrated with the EHR. Provider training can be provided by ABCD and the Regional Genetics Networks.

- **Challenges:** The technology challenges are minimal. The chosen cart does not have battery backup, which is available on higher-end carts. The vendor works with local tech support to install, test the connectivity, and train the users. Once installed and the users are trained, the challenge is seeing the
first patients successfully and learning for future encounters. This learning curve should be short if the technology and workflows are implemented properly.

• **Technical requirements:** ABCD will conduct a technology infrastructure assessment of the sites to be connected. The sites will need wireless access or hardwired ethernet connections for the telemedicine rooms. The rooms will also need 120vac power connections.

• **Peripheral Devices:** EFG Digital Scope System, and HIJK Digital Stethoscope. All the desired devices are FDA Class I approved or cleared.

• **Interoperability:** ABCD is standards based and is interoperable with other standards based vendors.

• **EHR Integration:** ABCD supports integration with numerous EHRs, including X, Y, and Z

• **HIPAA:** All ABCD video connections are encrypted to meet HIPAA HITECH requirements. PHI is not stored on the devices. ABCD will sign a Business Associate’s Agreement (BAA).

• **System security:** ABCD systems are password protected, software upgrades and patches are updated when needed, and calls are encrypted. PHI is not stored on the devices and the telemedicine carts have lockable drawers.

• **IT staff and support:** Due to the nature of the technology, we will need a PC Support technician, network engineer, and telemedicine audio-visual support. We will also utilize the vendor’s online and phone tech support, which is available during normal clinic hours (8am-6pm EST).

• **Home use capability:** ABCD can be used by patients in their homes via the mobile direct-to-consumer app, which can have our provider’s branding

• **Expandability:** ABCD’s system will allow future expansion to other providers and departments:
  o Connecting multiple providers
    ABCD enterprise solution
  o Cancer
    ABCD cart or tablet with peripherals if needed
  o Prenatal
    ABCD cart or tablet with peripherals if needed

• **Lifecycle:** The typical lifecycle is 3-5 years for the video systems and peripheral devices. (If lease is chosen over purchase, systems would be upgraded as needed during the lease).

• **Program back-up plan for technology failure:** Telehealth technology protocols will be in place. The first line of troubleshooting should be local IT, then the channel partner and/or ABCD. Depending on the level of ABCD maintenance chosen, ABCD can ship new hardware to the site overnight. A spare system could be purchased to insure backup if desired. Patients could also be offered in-person appointments if available, or phone consultations if appropriate to the clinical situation.
**Technology Implementation:**

Upon institutional approval and program readiness, ABCD has agreed to allow us to pilot the technology for 90 days at no cost. Upon successful completion of the pilot, contracts would need to be put into place. Legal departments at both sites would be involved in contract processes. For HIPAA compliance, a Business Associate’s Agreement (BAA) will be needed before the pilot phase commences. Other notable details about technology implementation are listed below, and also see the attached technology task list with a person assigned to each task, and detailed information on timelines, deliverables and milestones.

- **Needed contracts and agreements** - BAA, user contract, vendor maintenance or support agreement
- **User manuals and telemedicine policies** - User manuals for cart, peripherals, and tablets will come from manufacturers. A clinical encounter protocol, technology user tips and FAQ, and a telemedicine encounter checklist will be created by clinical staff and IT. Telemedicine policies and procedures will be created by the IT, legal, and compliance departments for all telemedicine in the facility.
- **Staff training:** The clinical genetics staff will undergo telemedicine training in collaboration with NYMAC, our Regional Genetics Network, which is free of cost. Training modules from the regional Telehealth Resource Centers will be made available to other staff members. Vendor-specific training will be provided by ABCD to IT and clinical staff, and IT will be available for further technology training as needed. Training costs should be minimal, but we estimate approximately $xxxx for staff time for training.
- **Telehealth room needs:** The telehealth rooms will need good lighting, a simple background, and appropriate furniture/exam table. The rooms should be free of ambient noise and soundproof for the patient encounter. As listed above, rooms also need wireless access or hardwired Ethernet connections and 120 vac power connections.
- **Use of existing institutional resources** (not including staff): Hardwired Ethernet, telehealth room
  - **Needed authorizations for resource reassignment:** Clinic Department Head, CFO, IT head
- **Items needing to be purchased/funded** (not including staff): technology, as listed above, telehealth training, telehealth room redesign
  - **Needed authorizations for purchases:** Clinic Department Head, CFO, IT head, Purchasing Department head

**IT Staff:**

Academic Medical Center has a large IT staff, but has not yet conducted telehealth. Community Hospital has an on-site IT team as well. Both IT teams will undergo telehealth training, as well as vendor-specific training before program launch. IT team meetings will be held between the sites quarterly. Product support is also provided remotely by the vendor during clinic hours.

- PC Support Technicians: Jane Doe (1-800-333-3332) and John Doe (1-800-333-3333)
- Network Engineer: Aaron Doe 1-800-333-3334
- Telemedicine AV Support: Bob Doe (1-800-333-3335), Christina Doe (1-800-333-3336), Doug Doe (1-800-333-3337), Emily Doe (1-800-333-3338)
- Other IT Team members: Fred Doe (1-800-333-3339), Gina Doe (1-800-333-3338)

*For more information:*
- **Clinical contact:** Dr. Smith, Genetics Dept Chair 1-800-222-2222
- **IT contact:** John Doe 1-800-333-3333
- **Technology website:**
- **Vendor contact:** Helen Doe 1-800-444-4444

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This document was made possible by the Health Resources and Services Administration (HRSA), Department of Health and Human Services (HHS) through funding from Cooperative Agreements # G22RH30353 (Office for the Advancement of Telehealth, Federal Office of Rural Health Policy) and # UH7MC30773 (Regional Genetics Networks). This content and conclusions are those of the authors and should not be construed as the official position or policy of, nor should any endorsements be inferred by HRSA, HHS or the U.S. Government.