



Emergency Preparedness Communication Options¹

Communication Option	Functionality	Limitations	Costs
Management of Existing Phone Lines			
Back-up Power Source for Internal Phone Switch (aka private branch exchange or PBX)	<ul style="list-style-type: none"> An internal phone switch powers the distribution and functioning of internal phone lines. If this phone switch loses electricity, then calls cannot be routed internally. An institution will usually only have a limited number of direct, outside phone lines that are then routed by an internal switch to support an exponential number of internal extensions, paging, etc. Must use uninterruptible power supply (e.g. batteries or connection to emergency generator) to power internal phone switch in case of electricity loss. 	<ul style="list-style-type: none"> Cannot protect against a power or line outage that occurs at the local phone carrier's switch (e.g., external switch). 	<ul style="list-style-type: none"> Cost of additional battery cells or connections to emergency generator.
Diversify Existing Phone Lines	<ul style="list-style-type: none"> To reduce dependence on one external phone switch, secure redundant phone lines for critical communication areas that run through a different central offices (external phone switch). Examples of critical communications areas include command center, ER, OR, ICU, nursing stations, security, switchboard, administration. The goal is to protect against power loss or wiring trouble that can bring down a local carrier's central office and cut off all phone lines that run through that switch. Your local carrier may have more than one central office (or switch) that can service your facility. Or another local carrier may use a different central office. 	<ul style="list-style-type: none"> Only provides true redundancy if the back-up phone line is carried through a different central office/external switching station. Some facilities may not be able to access more than one central office because of infrastructure limitations of local phone system. Only protects against a service outage at one switching station but cannot protect against area-wide outage that effect multiple switching stations. 	<ul style="list-style-type: none"> Cost of additional phone line (installation and monthly fees)
Secure Prioritized Repair of Existing Phone Lines	<ul style="list-style-type: none"> Telecommunication Service Priority (TSP) program is sponsored by the Federal Communications Commission (FCC) to prioritize repair of phone lines designated as critical to national security or emergency preparedness. Health care facilities eligible under "Category C, [4]" 	<ul style="list-style-type: none"> Only certain phone lines can be designated as priority for repair. Will not cover all phone lines and does not provide interim communications capabilities Must secure sponsorship by a Federal 	<ul style="list-style-type: none"> No outright costs.

¹ This document was prepared by GNYHA to assist members' assessment of communication options for emergency preparedness. It is intended to provide an overview and should not be construed as technical advice.



	<p>Hospitals and distribution of medical supplies”</p> <ul style="list-style-type: none"> • Must be sponsored by a Federal Government agency. HHS is designated sponsorship agency for health care. 	<p>government agency</p> <ul style="list-style-type: none"> • TSP assignments must be renewed every two years. 	
Voice Communication - Cellular, Satellite and Radio			
<p>Cell Phone (vendors: Voice Stream , AT&T, Verizon, etc.)</p>	<ul style="list-style-type: none"> • Regular cellular phone coverage that can work when land-line phone switches are down. 	<ul style="list-style-type: none"> • Can lose cellular coverage if transmitter is damaged. (however, a cell-on-wheels (COW) can be used to restore cellular coverage on a temporary basis). 	<ul style="list-style-type: none"> • Will depend on model of phone, number of users and service contract.
<p>Cell Phone with Two-Way Digital Radio (vendor: Nextel)</p>	<ul style="list-style-type: none"> • A phone with regular cell phone capabilities and two-way digital radio capabilities. • Two-way digital radio does not use regular phone line switches, allowing continued service even if phone switches go off-line. • Two-way digital radio can be used for person-to-person communications (similar to a regular phone call). • For phones within a fleet (i.e., phones that are programmed to work together), there is ability to broadcast a message to every phone in fleet. Message can be traditional voice communication or an e-mail message sent via keypad or the internet. 	<ul style="list-style-type: none"> • Can lose cellular coverage if transmitter is damaged. (however, a cell-on-wheels (COW) can be used to restore cellular coverage). • Usage bills can be substantial. Direct two-way digital radio will have no fee but there will be a charge for group minutes (group broadcast) • For broadcast feature to work, phone must be programmed as part of a fleet. A phone can not be part of more than one fleet. • Important to consider quality of cellular coverage for your area. 	<ul style="list-style-type: none"> • Will depend on phone model, specifics of service contract and number of users in fleet. • Basic models phones may be free with service contract while more sophisticated phones will run from \$100-\$250. • Basic phone service costs approx \$10 per month. Medium to high service costs more in range of \$30-50 per month.
<p>Wireless E-mail device (vendor: Blackberry)</p>	<ul style="list-style-type: none"> • Wireless, handheld device that allows users to read and respond to e-mail from an existing e-mail account. Utilizes wireless data networks that run two-way radio transmissions (and some satellite transmission). • Can receive pages through existing telephone or internet paging systems. • Can access internet using filters to limit information transmitted (to reduce costs and increase readability on small screen). 	<ul style="list-style-type: none"> • For access for corporate e-mail, system must run a Microsoft or Lotus e-mail program. • Can lose coverage within a building or in a dead-spot within wireless data network. 	<ul style="list-style-type: none"> • Depends on number of users, type of unit and type of services (e-mail, paging, internet, etc)
<p>Satellite Phone (vendors: Motient, Iridium)</p>	<ul style="list-style-type: none"> • Satellite phone transmits voice and data messages via satellite. Satellite phone to satellite phone communication will work when phone switches and cellular transmitters are down. 	<ul style="list-style-type: none"> • Urban area will have line of sight issues – satellite unit may need to be hard wired to antenna. • Administrative function for talk group. 	<ul style="list-style-type: none"> • \$500 for antenna plus labor to install and wire. • \$2,000 to \$5,000 for satellite phone unit

	<ul style="list-style-type: none"> • Satellite phone can also be used to place regular telephone and/or two-way digital radio communications (presuming that phone switches are working). Can also handle fax and data transmissions. • Transmission will work only if satellite unit is within a line of sight or hard-wired to satellite antenna (antenna placed on top of building). • There is an administrative function necessary to set up and maintain user rights to satellite talk group. 	<ul style="list-style-type: none"> • To speak from satellite phone to satellite phone – both users must be using same vendor/satellite system (e.g. Iridium user cannot speak with Motient user). • Location of satellite receiver determines access to phone lines. E.g. if receiver location does not have phone service because switches are down, the satellite system cannot access regular phone lines. 	<p>(advisable to have two – one as back-up).</p> <ul style="list-style-type: none"> • \$30-50/month for talk group access.
800 Megahertz Radios (e.g. Motorola)	<ul style="list-style-type: none"> • 800 megahertz radio allows voice transmission over a designated radio frequency. • Use hand-held radio unit to communicate with the Mayor’s Office of Emergency Management and other health care facilities on a designated frequency. • NYS is developing a state-wide emergency radio system. It may use a different frequency (700 megahertz) but a receiver can be used transmit across frequencies 	<ul style="list-style-type: none"> • May require purchase of an antenna if coverage is poor. Because of high frequency, it can be difficult to transmit through building walls. • Existing radio units will need to be programmed for health care designated frequency. 	<ul style="list-style-type: none"> • Portable unit costs approximately \$3,000. • A base station costs approximately \$5,000.
Amateur Radio	<ul style="list-style-type: none"> • Amateur radio can provide health care facilities with a voice communication method of last resort. Will work when phone switches, cellular transmitters and other radio systems are down. • Integrate with existing NYC RACES amateur radio program sponsored by NYC Mayor’s Office of Emergency Management. • Secure hospital based amateur radio hardware and develop plan to operate system using amateur radio operators (may be drawn from existing hospital staff) • Need to designate a call channel/frequency for communications 	<ul style="list-style-type: none"> • Only an individual can hold an amateur radio license. A hospital or SNF cannot hold the license. • Need to integrate amateur radio into health care facilities existing emergency preparedness structure. Conduct drills and testing. • Portable radio units may not be able to penetrate building walls. May require antenna on top of building. • Antenna could interfere with cellular coverage. • Communications are not secure.– anyone can listen. 	<ul style="list-style-type: none"> • Approx \$150-\$300 for portable radio • An antenna and base radio-set up may cost several thousand dollars.
Data Communication – Frame Relay, ISDN, Cable and VoIP			
Frame Relay (data)	<ul style="list-style-type: none"> • Frame relay is a protocol for transferring data between two points in a wide area network (WAN) or two local area networks (LANs) • In effect, frame relay allows a dial-up connection to a 	<ul style="list-style-type: none"> • Communications via frame relay are not secure. Information being sent over shared lines. • Communications (or frames) containing 	<ul style="list-style-type: none"> • Approx \$300-\$600 per month depending on complexity of connections. More

	<p>service provider's data network (most often the telephone company). As opposed to using your own T-1 lines, frame relay makes use of the service provider's existing data lines (most often T-1 or T-3 lines).</p> <ul style="list-style-type: none"> • Creates a permanent virtual circuit that seems like a continuous connection to the user but has a much lower cost than a continuous connection. • Works well in conjunction with ISDN 	<p>errors can be dropped – although error rate is very small. Customer can select a level of service to reduce number of dropped frames (performance guarantees)</p> <ul style="list-style-type: none"> • Protect against loss or damage to your institution's T-1 or other data lines. Cannot protect against loss of data line functionality by service provider. 	<p>expensive for performance guarantees</p>
ISDN (Integrated Services Digital Network)	<ul style="list-style-type: none"> • ISDN is a communications standard for sending voice and data over digital telephone lines or normal telephone wires. A dial up connection into an ISDN data line allows point-to-point transmission of data. • ISDN is generally available through local phone carriers and is reliant on functioning phone switches. • Works well in conjunction with frame relay technology. 	<ul style="list-style-type: none"> • ISDN is dependent on phone switch and will go out if phone switch goes down. 	<ul style="list-style-type: none"> • Monthly charge of approx \$30 plus a per character transmission fee
Cable Modem <i>(vendors: Road Runner, Verizon, etc)</i>	<ul style="list-style-type: none"> • Allows two-way data transmission between user and cable TV operator. Provides a continuous connection to the internet that is independent from telephone lines. • Dependent on operation of cable lines. • Can provide internet access for multiple PCs attached to one LAN 	<ul style="list-style-type: none"> • Requires firewall to ensure security against a continuous, open connection to the internet. Current firewall can be adapted for this purpose. • Can be slow depending on number of users on cable line. 	<ul style="list-style-type: none"> • Monthly charge of \$40-60 for cable service. Additional costs for multiple PCs. • New firewall, if necessary, can cost upwards of \$10,000
VoIP (Voice Over Internet Protocol)	<ul style="list-style-type: none"> • An internet protocol that allows voice communications to be delivered over a data network (i.e., the internet). • Can provide a backup to traditional phone systems because it does not rely on the public telephone network for whole length of transmission. • Can send information both externally (via internet) and internally (via intranet) 	<ul style="list-style-type: none"> • Timely delivery of voice messages can be a problem. Vendors may provide quality of service guarantees for timely delivery. • In some cases the public telephone network is used to route voice communication into a data network. As such, the system will go down if the telephone network goes down. 	<ul style="list-style-type: none"> • Avoids long distance telephone charges • Operational costs to be determined.
Diversify Existing Data Lines	<ul style="list-style-type: none"> • Maintain a redundant data line to protect against a power loss or trouble with wiring that effects one external switching station. • Data line must run through different data line switch to achieve true redundancy. 	<ul style="list-style-type: none"> • Protects against service outage on one data line switch but cannot protect against area or system-wide outages 	<ul style="list-style-type: none"> • Cost of additional data line (installation and monthly fees)